DIGITALISATION, NEW GENERATION TECHNOLOGIES AND THEIR EFFECTS ON FINANCE

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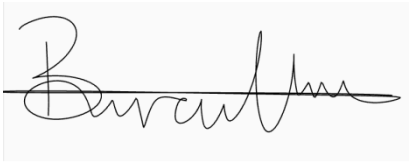
Signature: 

ÖZET

Teknoloji kullanımı teknoloji gelişimiyle beraber orantılı olarak artmaktadır. Bu çalışmada finansal teknolojilerin ve dijitalleşmenin yeni nesil teknolojilerle olan etkileşimi ile birlikte şimdiki ve gelecekteki etkileri belirtilmektedir. Dijitalleşme ve yeni nesil teknolojilerin gerçek dünyada hangi anlamlar ifade ettiği açıklanmaktadır. Bununla beraber bu teknolojilerin dünyayı değiştirici etkileri savunulmaktadır.

Bu tez çalışmasında finansal teknolojilerin hangi alanlara uzandığı ve nasıl etkilerde bulunduğu ön plana çıkarılmakla beraber gelecekte nasıl bir işleyişe hakim olacağı öngörülmektedir. Sektörde yarattığı değişiklikler ve hangi alanlarda nasıl yenilikler getirdiği gözler önüne serilmektedir. Bunlarla beraber istatistiksel çalışmalar ile finansal analizler yapılmakta ve sonuçlar ortaya konmaktadır. Bu sonuçlar rapor olarak sunulduğunda finansal teknolojilerin ülke bazında nasıl etkiler oluşturduğunu göstermektedir. Sonuç olarak dijitalleşmenin ve yeni nesil teknolojilerin finans üzerindeki etkileri ortaya konmaktadır.

Anahtar sözcükler: Finansal Teknoloji, Dijitalleşme, Sektörel Teknoloji, Korelasyon Analizi, Finans

ABSTRACT

Technology usage is increasing day by day as development of the technology is increasing. The aim of this thesis is to investigate and identify the present and future effects of digitalisation and financial technologies which are improved by new generation technologies. In addition the term of digitalisation and new generation technologies are presented. These technologies highlight the world-wide competitive game changer effects, but differ from sectoral constructions.

The thesis then identifies the uses of financial technologies, and further outlines the structure of financial technologies and services in sectors. In detailed sections of the thesis provide an overview of sectors which are dominated by new generation technologies, including production channel, distribution channel and social and personal channel with well-defined properties.

Moreover, detailed sections reveal the statistical calculations, which draws numbers of the cash flow and customer analytics by banking terms according to countries balance sheets and customer reported graphs. Here, comparison of countries is highlighted according to years and terms, and customer reports which answer the big argument of digitalisation. The thesis argues that digitalisation and new generation technologies affect the finance and countries in terms of economic and global conditions in positively. As a result, statistical calculations outline the importance of the digitalisation and new generation technologies on finance.

Keywords: Correlation Analysis, Digitalisation, Technology, Finance, Sectoral Technology, Financial Technologies

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INTRODUCTION

Digitalization and new generation technology are the game changers in every sector, world-wide range although in every daily transaction. Organizations, companies, sectors must focus on technology to survive in today's world. Technology transformed the consumer demands on products and, or services that they present, perform. "The financial technology environment is a dynamic, high-pressured, fast-paced world in which developing fast and efficient buy-and-sell order processing systems and order executing (clearing and settling) systems is of primary importance."[1]

Digitalization highlights every daily technology usage with simplifying business competitiveness, economic survive and personal and social improvement. Digitalization and new generation technology improve the daily life including business and economy. However, these simplifying brings challenges for all businesses and personal improvements. It is not only a way to improve the daily, standard transactions but also survive in a technologic manner. For example, a person cannot be known as a good worker if he or she does not have one of Facebook, Instagram, LinkedIn, WhatsApp accounts. In addition, if a company does not have a well-designed web-site, LinkedIn page, Google Ads it is mostly not known, small enterprise which does not have a good defined profit and worker image.

In this thesis, the problem is how strong are digitalization effects on finance and daily standard transactions, on both of personal and business life. The study includes statistical analysis which highlights the numbers coming from cash flows and customer reports calculated by SPSS. This thesis presents world-wide analysis in terms of both local and global data which mean analysis contains different countries.

[1]Roy Freedman, 2006, Introduction to Financial Technology, p.287

1.DIGITALISATION AND NEW GENERATION TECHNOLOGY

The term of 'digitalization' firstly used in a 1971 essay, published by North American Review as "digitalisation of society". It was about context and potentials of "computer-assisted humanities research".[2] This term has different usage of meanings in terms of sectoral state of affairs. In todays' conditions, of course technology is the major element, digitalisation is technology driven 'things'. Digitalization, adds wide range technologies which are accessible by everyone so it is involved in most important cultural, behavioral, demographic and life-cycle changes. Basically, as a result of digitalisation, life-long learning, e-commerce, e-banking, e-books, e-news, e-learning, etc., terms appeared. Briefly, "knowledge society" term occurred however, world's system, structure of the economy and technology still has to be maintained continuously.[3]

As explained what digitalisation is, result is 'something' nested with technology; however, it is not facile to define technology. "*Technology can and does often apply to devices such as computers and communications networks, but can also be applied to practices (for example, the software development process), and techniques (for example, database design). Information systems can be expected to make use of information technologies, but are not synonymous with technology. An information system is in essence a humanactivity system situated in an organisational context – technology is important to information systems but must beconsidered jointly with human and organisational dimensions.*"[4]

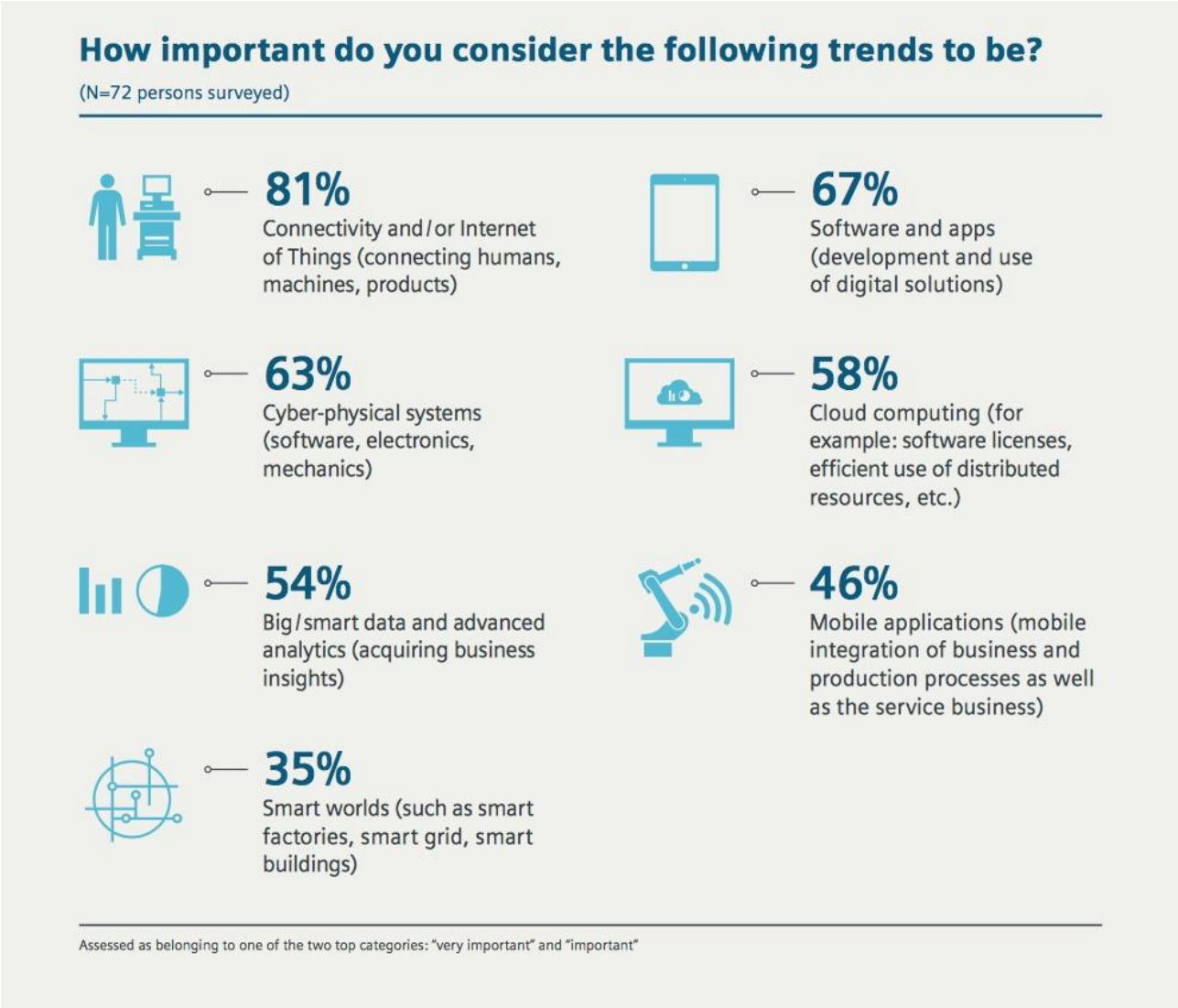
[2]Scott Brennen & Daniel Kreiss, 2014, Digitalisation and Digitization, International Encyclopedia of Communication Theory and Philosophy, p.3-15
[3]JariKupiainen, 2006, Translocalisation over the Net: digitalisation, information technology and local cultures in Melanesia, E-learning and Digital Media, Vol3, p. 280-287
[4]Avison, D. and Fitzgerald, G., (2002). Information Systems Development: Methodologies, Techniques and Tools, 3rd edition, McGraw-Hill, Maidenhead, Chap. 1-3

Context of digitalisation has very complex and relational dynamics as much as technology. Jack M. Balkin explained what digitalisation is in that large concept as "*What makes the Internet so vibrant and so special is precisely that many different people get to communicate- not just people who own or work for large, mass media organisations. That is also what makes the Internet so full of content and discussions on every possible topic. By greatly lowering the costs of content transmission and distribution, and by providing a general purpose data transport, storage, and publication system, the Internet has effectively harnessed the world'sinterests, creativity, and intelligence to produce an enormous archive of, well, everything*."[5].

Moreover, like first meaning of digitalisation, "computer-assisted", Jack M. Balkin shows as Internet usage increases, "social networking" term appeared. "A social network is a social structure made up of individuals (or organizations) called "nodes," which are tied (connected) by one or more specific types of interdependency, such as friendship, kinship, common interest, financial exchange, dislike, sexual relationships, or relationships of beliefs, knowledge or prestige".[6] It was not smooth transition from increase in technology and being in a social-networking community, because there was issues that occurred with digitalisation: "regulatory" and "technical" decisions. When small pieces of the story of digitalisation, were ligatured and crucial map shows the reality: This is not a simple story, still continuous and briefly it is digitalisation.[7]

[5]Jack M. Balkin, 2009, The Future of Free Expression in a Digital Age, p.436, Pepperdine Law Review, Vol. 36
[6]Shashi Shekhar, Dev Oliver, 2010, Computational Modeling of Spatio-temporal Social Networks: A Time-Aggregated Graph Approach, p.1
[7]Jack M. Balkin, 2009, The Future of Free Expression in a Digital Age, p.436- 440, Pepperdine Law Review, Vol. 36

Figure 1: DigitalizationofPeople[8]

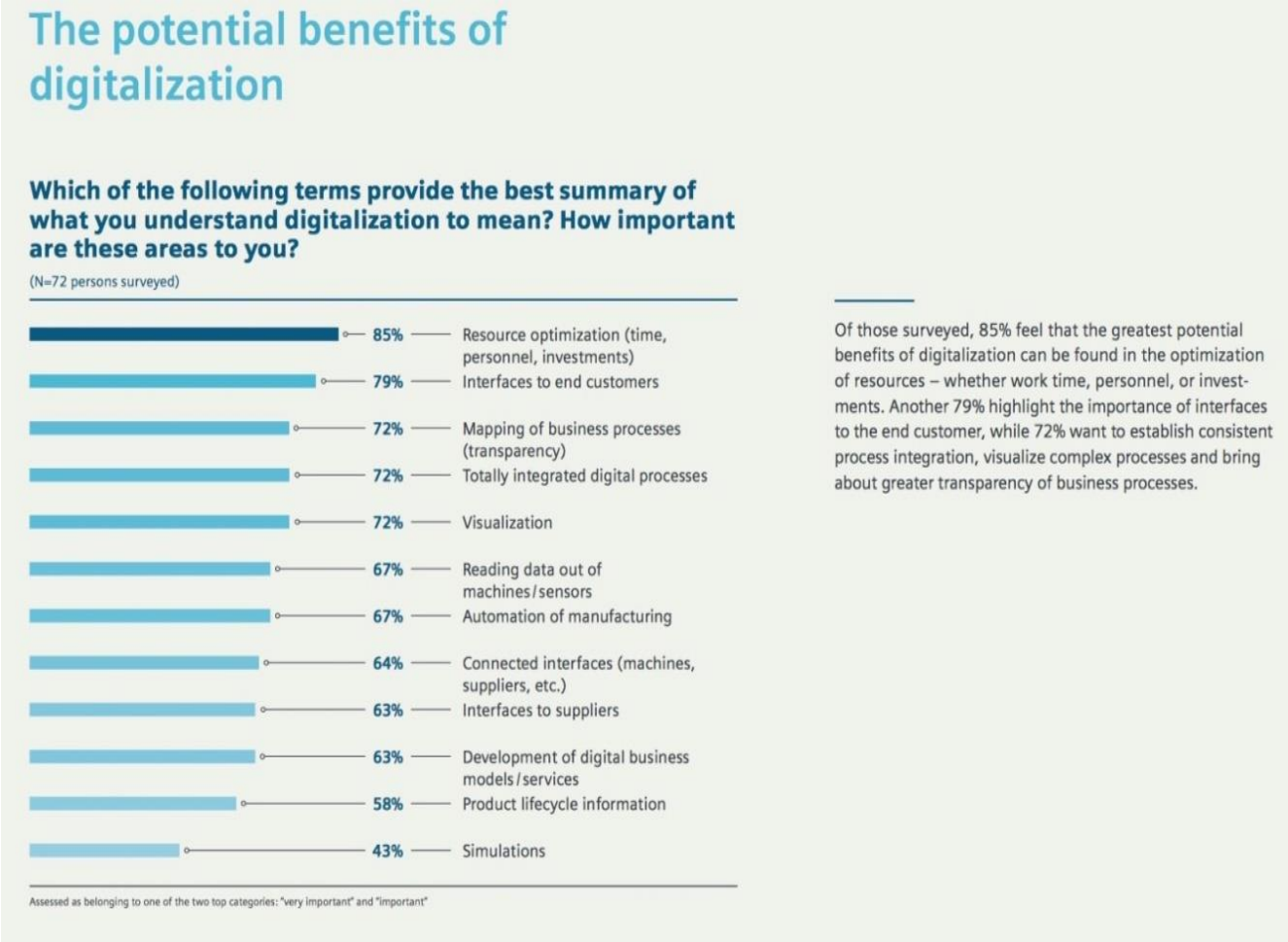


As story proceeds, digitalization caused "technology consumption" which includes technologies and devices. According to researches, most people have internet access and use smart-phones and other goods and services; they are active users for creating their own social-networking sites and digital platforms.[9] This is the main part of the digitalisation because it shows how people have main role on digitalisation even if on their daily life.

[8]Siemens, 2015, Trends and Solutions for a More Competitive Portugal, p.11
[9]J. Denegri- Knott and M. Molesworth, 2012, A history of the digitalisation of consumer culture: From Amazon through Pirate Bay to FarmVille, Digital Virtual Consumption, p.2-8

That's why digitalisation has no standard patterns and no limitations to go on and increased. According to Don Tapscott, revolution of technology leads to digitalisation and new ways of thinking, working, socializing occurred.[10]

Figure 2: Business Benefits of Digitalization[11]



To understand effects of digitalisation, it might be explained in two parts: Business Routine and Daily Routine. To start with, according to Figure 2, Business Benefits of Digitalisation, it is prove that business cannot be thought without digitalisation. In every business routine process, digitalisation plays essential role. 85% resource optimization, including time, personnel and investments, is outstanding percentage. Companies put new digital standards to work with as rules. It is intriguing that e-mails are not digital enough anymore.

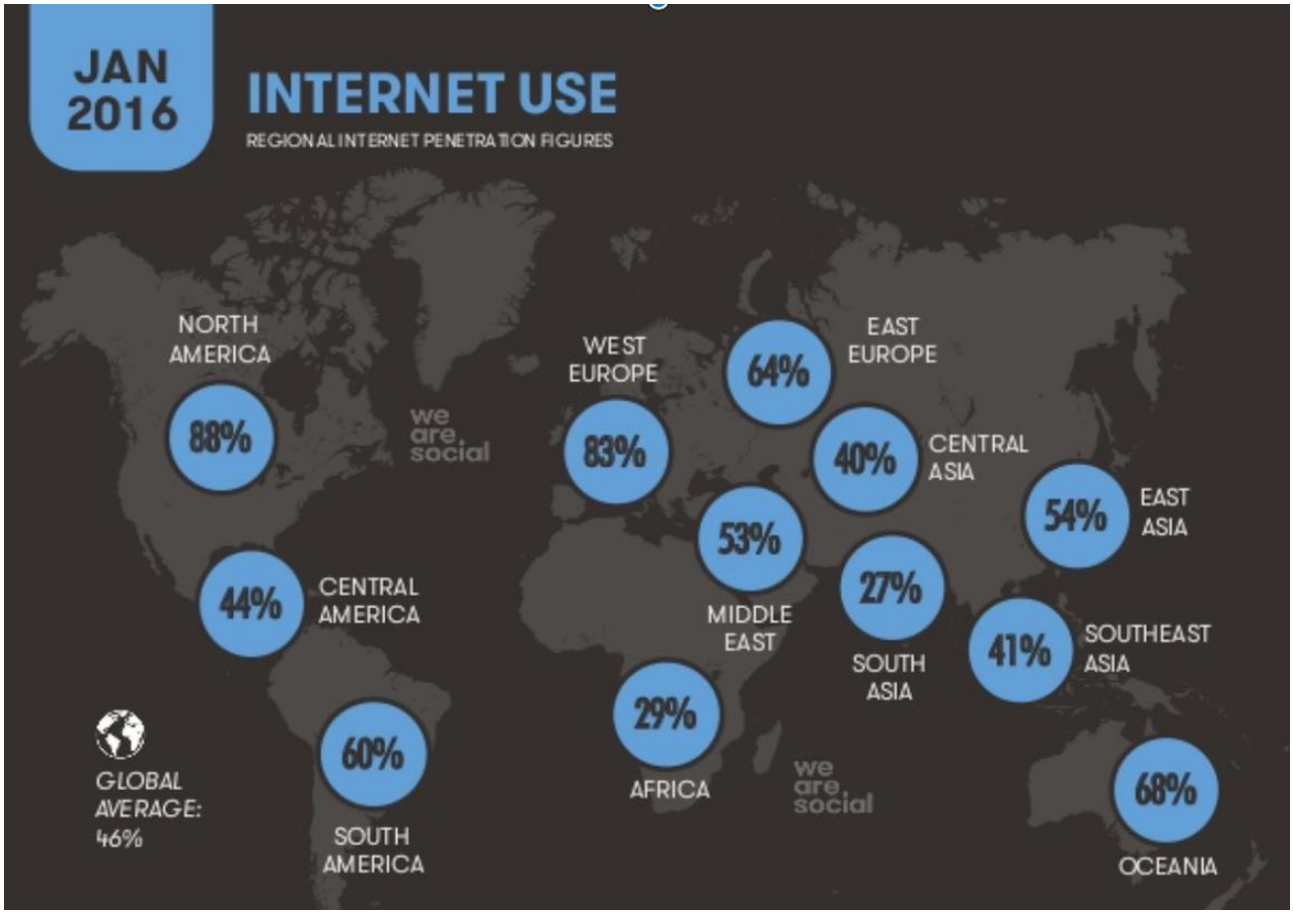
[10]Don Tapscott, 2008, Growing Up Digital: How the Net Generation is Changing Your World, p.20-25
[11]Siemens, 2015, Trends and Solutions for a More Competitive Portugal, p.15

According to Deloitte it is argued that e-mails still include digitalisation: "*…every smartphone includes an email app. The email format has changed little over the last few years, yet it remains a simple and useful way to send and receive communication quickly*".[12] New tools, such as digital communication tools, on smart phones, anywhere any time reachable, lead digital standards in business life.

At the second part, effects of digitalisation at daily routine explained at Figure 3, Digitalisation Usage. "*Millions of apps are now available to smartphone consumers, with approximately a million just for games. The vast majority of smartphone user time is spent in apps and some of the most successful digital services, from social networks to ordering taxis, are available via an app.The app market has proven, in aggregate, lucrative, albeit with the value spread across hundreds and thousands of publishers. Over the last eight years, app stores have generated tens of billions of dollars in revenues via download sales and in-app payments. The most successful apps have been downloaded over a billion times.*"[13]Following figure, How Fast Digitalisation Is, shows that digitalisation shapes the world as faster as it can be.

[12]Deloitte, 2016, p.42, There Is No Place Like Phone, Global Mobile Consumer Survey 2016: UK Cut
[13]Deloitte, 2016, There Is No Place Like Phone, Global Mobile Consumer Survey 2016: UK Cut, p.48

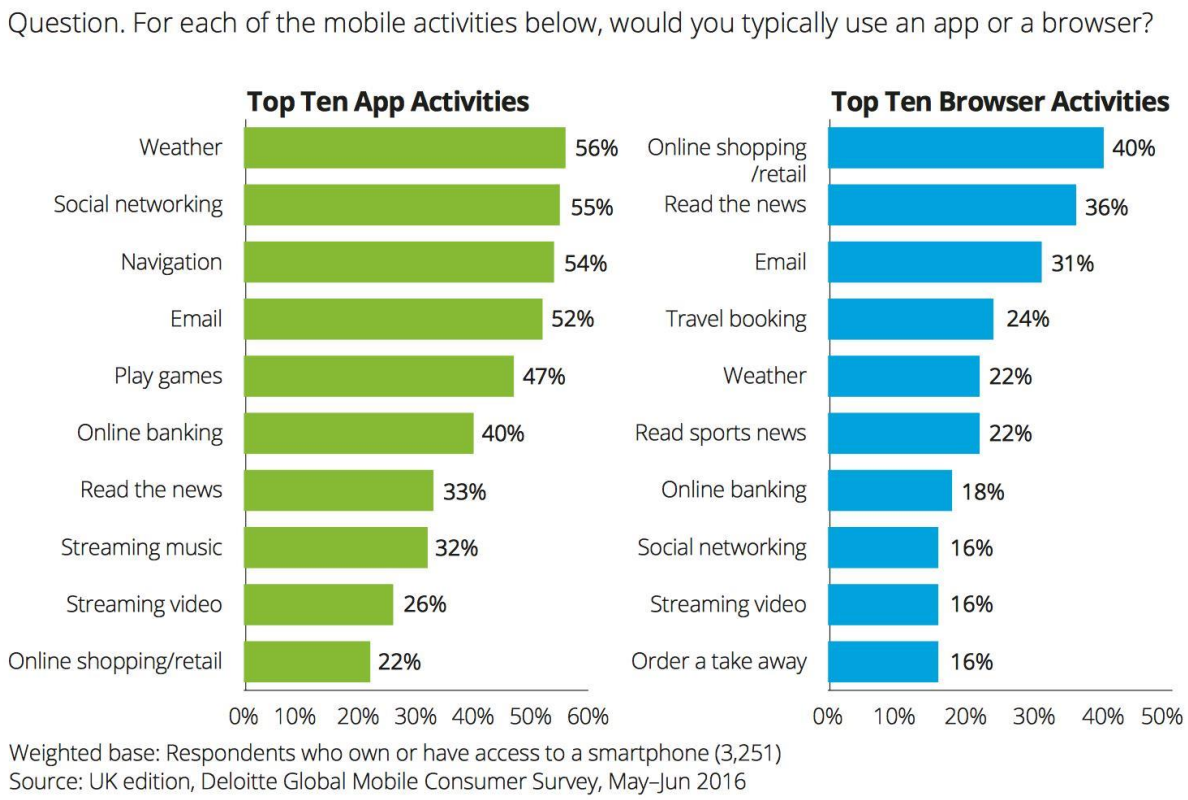
Figure 3: How Fast Digitalisation Is[14]



In addition, at Figure 4,Digitalisation Usage Spread, it is outstanding spread of world-wide range of activities that shows digitalisation is not only percentage that shows importance of people's life; it is not luxury needs; it is very main part of daily routine: it is "undeniable" truth.

[14]Digital in 2016, We are Social, 26 jan 2016, p. 21

Figure 4: Digitalisation Usage Spread[15]



For example, before going work or school or a meeting, people do not go out before checking the weather. In traditional way, people prefer to use browsers, however thanks to digitalisation, by mobile applications it is very efficient way to check weather. Moreover, digitalisation allows people to see weather according to arranged notifications from them and on smart devices, it is showed as notifications such as messages, mails , etc., available on devices screens.

As another example, even if in daily routine most of people use social networking platforms such as Facebook, Swarm, WhatsApp, Instagram, Viber, etc. People share their personal information such as work phone number, family tree, photos, places they work, locations they are at, feelings they are having, activities they are doing, people who they are with, schedule they are responsible, etc., for via social networking platforms.

[15]Deloitte, 2016, p.49, There Is No Place Like Phone, Global Mobile Consumer Survey 2016: UK Cut

Moreover, “Social Networking” is one of the keyword of digital world. Improvement of technology with results of digitalisation, new term is appeared, ‘new generation technology’.

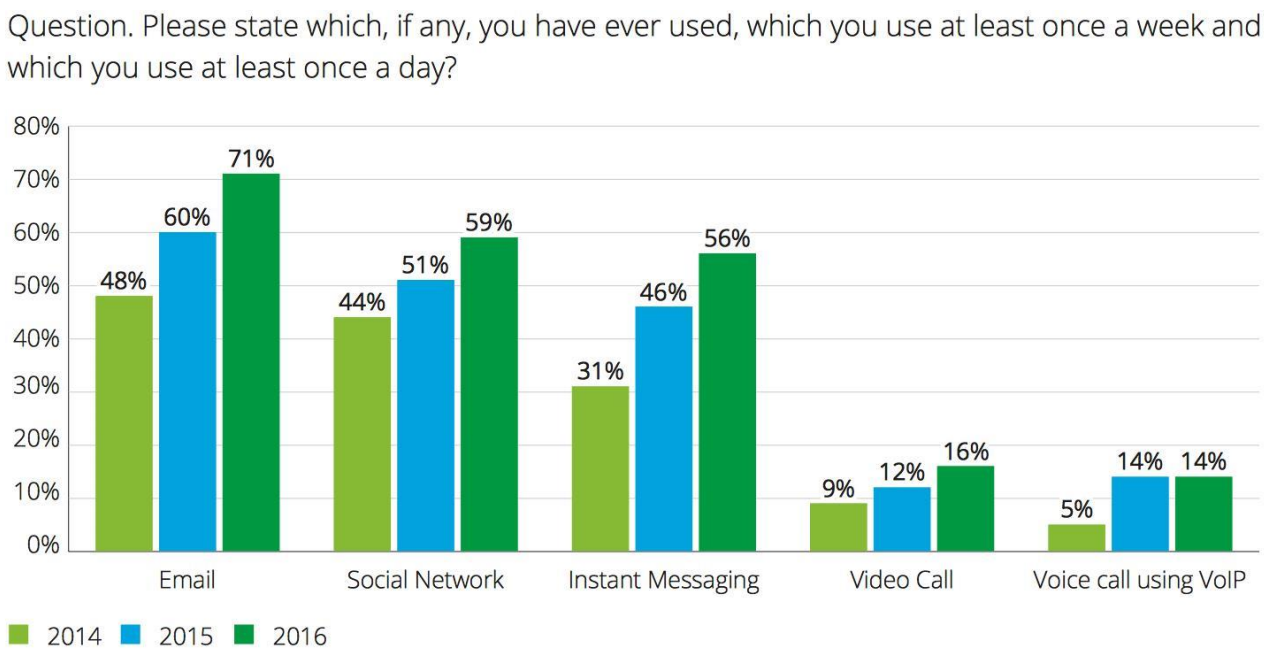
According to Don Tapscott, on his book Growing Up Digital, technology creates the digital world and new generation technology.[16] He explained new generation technology as a society who are shaped by technology and actually think different.

In addition, Wolfgang and Leo explained new generation technology in society: *“Recent technological advances have enabled the development of software that performs analytical, interpretative (pattern matching) and interactive tasks that are typical for work in many services industries*.”[17] They placed importance of technological development which is the fundamental element of new generation technology.

To understand how fast new generation technology in society developed, Figure 5, Digitalisation Usage, prove outstanding result by yearly comparison. For example, e-mail daily checking in 2014 was 48%, in 2015 was 60%, in 2016 is 71%. The surprising range between 2014 and 2016 is 23%. In addition, for instant messaging range between 2014 and 2016 is 25%. Figure 5, explained detailed activities comparison by year is given below.

[16]Don Tapscott, 2008, Growing Up Digital: How the Net Generation is Changing Your World, p.25-51
[17]Wolfgang Grief & Leo Hannes, 2015, Effects of Digitalisation on Service Industries and Employment, European Economic and Social Committee, p.1

Figure 5: Digitalisation Usage[18]



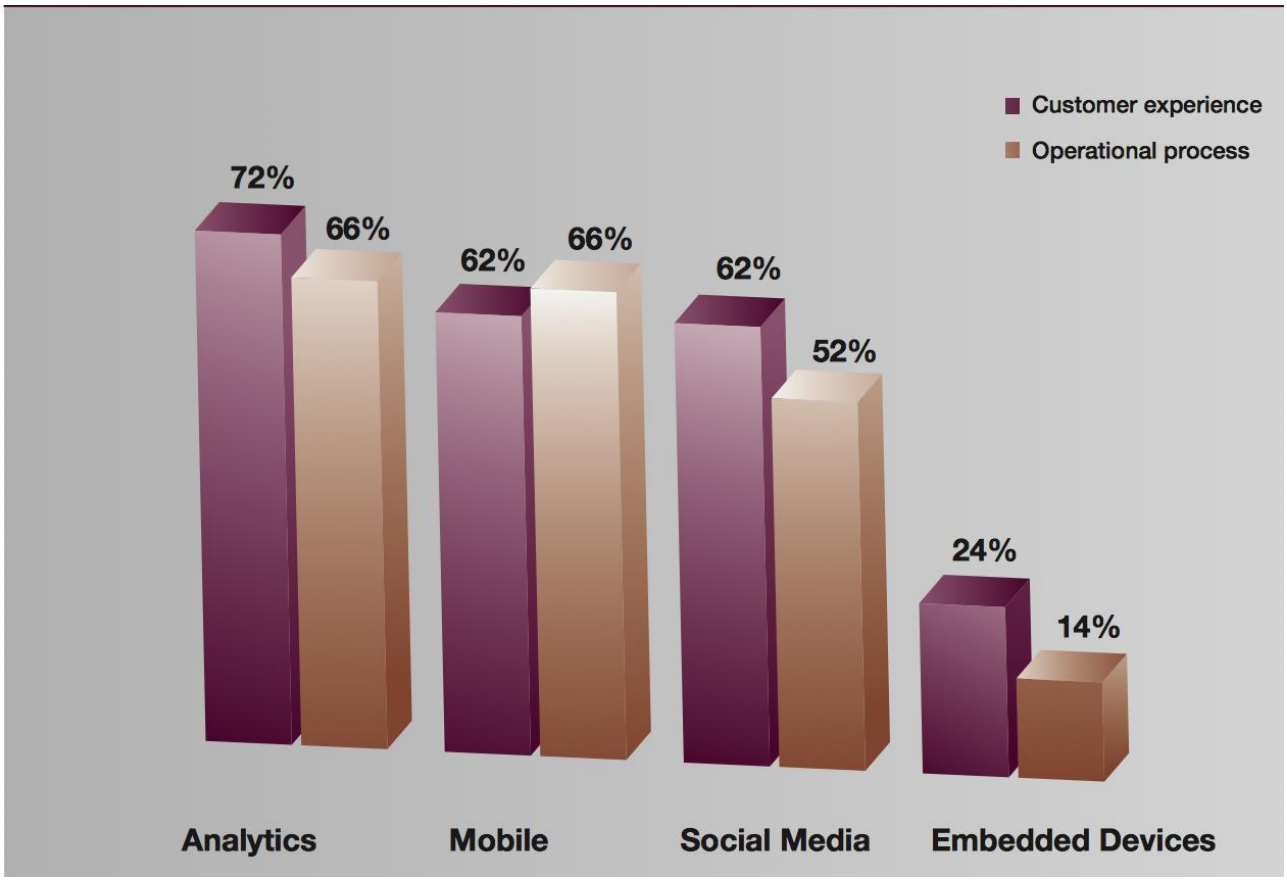
According to Figure 6, Become part of New Generation Technology, new generation technology usage by customer experience (end users) and operational process (technology development) are explained. It is clear that new generation technology mostly used for analytics. It should be paid attention to that smart mobile devices make any information accessible for every users around the world and it is not predictable what people can do by these technological advances. This situation is actually can be explained as new generation technology.

In addition, PWC showed off the prominence of the mobile devices usage on new generation technology. According to their published research, they explained it as "*Digital technology continues to expand its influence. The infrastructure backbone of the digital world is bringing affordable broadband to billions of consumers. In parallel, low-cost connected devices are being deployed in every industry, and cloud computing, and the fast information-processing*

[18]Deloitte, 2016, p.42, There Is No Place Like Phone, Global Mobile Consumer Survey 2016: UK Cut

machinery it requires, is developing quickly."[19]. Low-cost connected devices (especially mobile devices) and fast information (social media and analytics) constitute the new generation technology.

Figure 6: Become part of New Generation Technology[20]

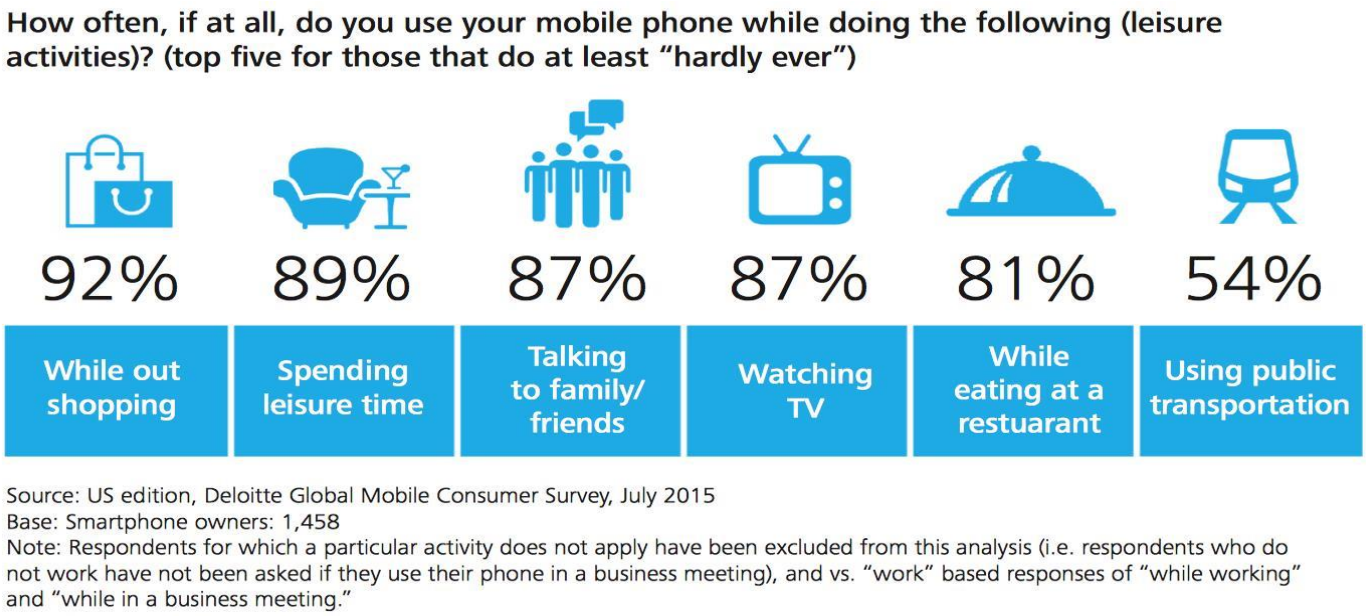


In the same boat, like PWC, Deloitte mobile usage report flaunts that society have to learn how to deal with new generation technology. It is clear that mobile devices shape daily life in every activity people do. Figures given bellow explain how important role that mobile devices have on digitalisation and new generation technology.

Like Deloitte, according to Figure 7, Mobile Usage and New Generation Technology, it is essential result that mobile usage shapes people's daily life completely in every activity. Shopping by mobile devices, 92% usage precipitous percentage, is separately enough to prove how vital is mobile devices on new generation technology.

[19]PWC, 2016, Digital Solutions, p.1-5
[20]CapgeminiColsulting, Digital Transformation: a roadmap for billion-dollar organizations, 2011 MIT Center for Digital Business and Capgemini Consulting, p.29

Figure 7: Mobile Usage and New Generation Technology[21]



According to Figure 7.1 and 7.2, activities in the middle of the night by percentage are explained during mobile phone usage. It is outstanding result that people do not use even the watch to check the time, it is accepted that primary device is mobile phone. In addition, checking instant messages and checking social media notifications is second activity under these conditions which actually means that digitalisation is main part of people's lives.

[21]Deloitte, 2015, Global Mobile Consumer Survey: US Edition The rise of the always-connected consumer, p.4

Figure 7.1: Mobile Usage and Digitalisation Habits[22]

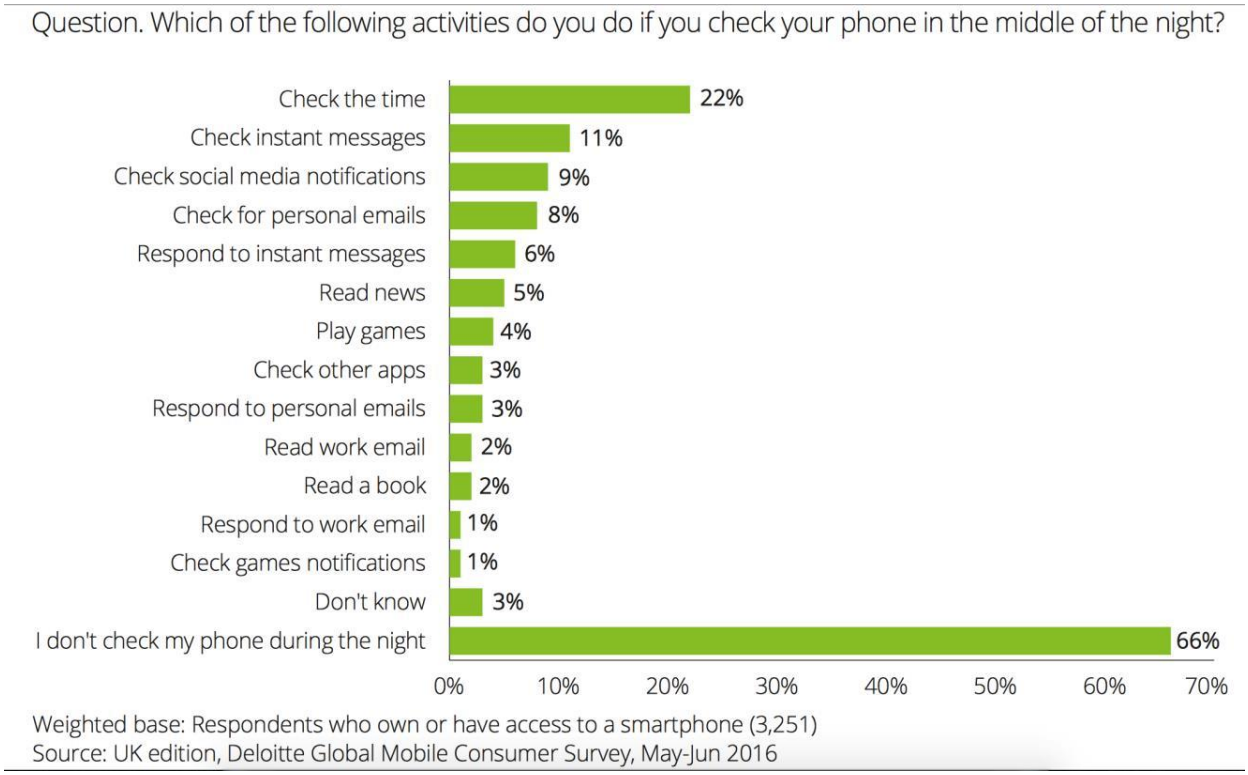
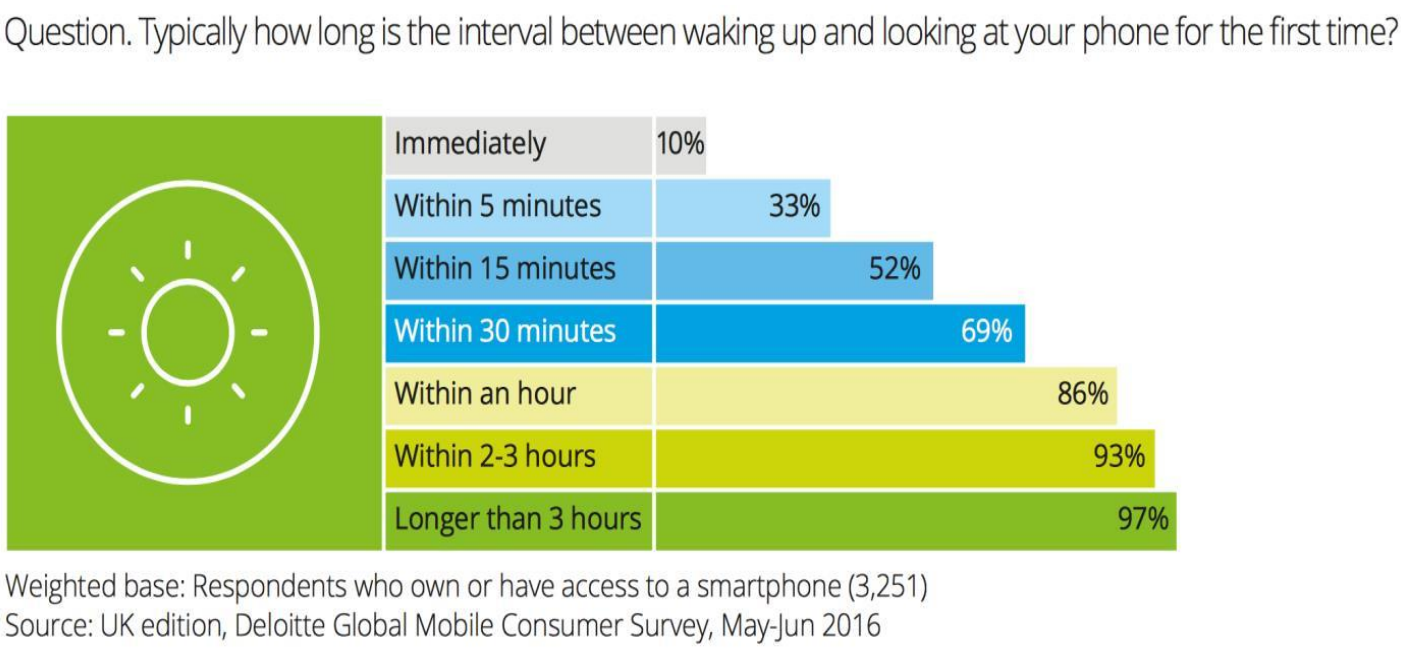


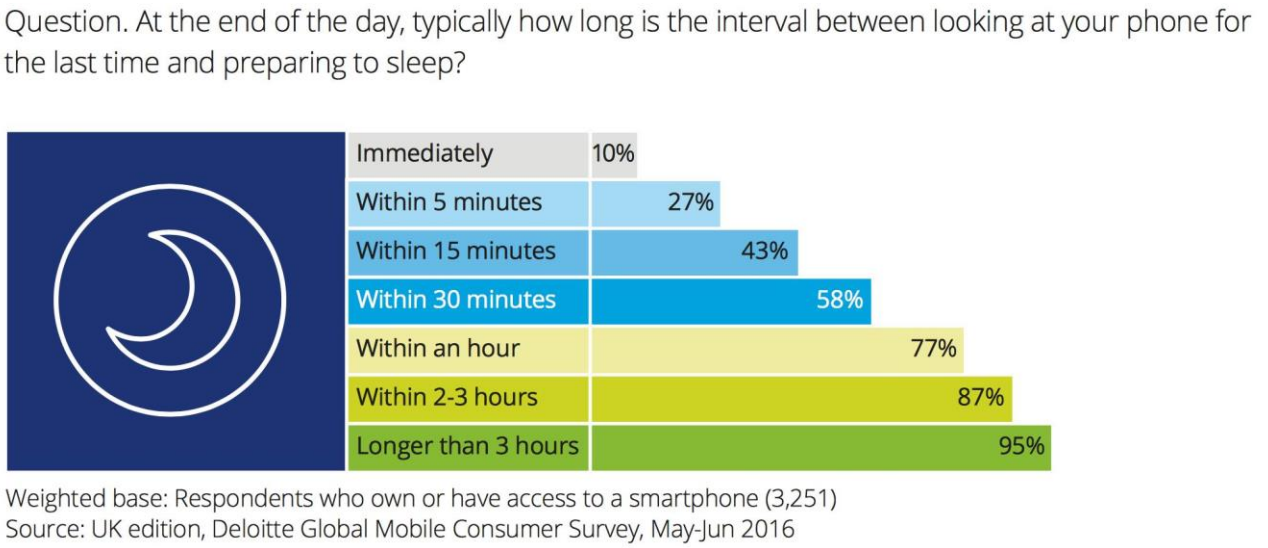
Figure 7.2: Mobile Usage and Digitalisation Habits[23]



[22]Deloitte, 2016, There's no place like phone, Consumer usage patterns in the era of peak smartphone Global Mobile Consumer Survey 2016: UK Cut, p.6

[23]Deloitte, 2016, There's no place like phone: Consumer usage patterns in the era of peak smartphone Global Mobile Consumer Survey 2016: UK Cut, p.4

Figure 7.3: Mobile Usage and Digitalisation Habits[24]



According to EY "digital innovation" is a must to survive for both of people and companies. They explained their report in 2011, The digitization of everything-How organizations must adapt to changing consumer behavior, the concept of "everything".

"*The real imperative in a world where 'everything' is digitised is that businesses need to pursue innovation to disrupt their own business model before the competition does. Without innovation strategies, companies will lose their competitive advantage inan increasingly commoditised world. There is no time to lose, as technology change accelerates exponentially and new digital platforms and devices are emerging. Furthermore, the expectations of the new 'generation Y' or 'digital natives' mean that companies must keep up with the pace of change or lose relevance.*"[25]

[24]Deloitte, 2016, There's no place like phone: Consumer usage patterns in the era of peak smartphone Global Mobile Consumer Survey 2016: UK Cut, p.5
[25]EY, 2011, The digitisation of everything-How organisations must adapt to changing consumer behaviour, p.1

2. CHANGES ON SECTORAL TECHNOLOGY AND TECHNOLOGICAL CHALLENGE

Sectoral technology includes all operation systems that countries' manage to survive which are listed as below and explained with deep details in this part.

- Distribution Channel,
- Production Channel,
- Personal and Social Channel.

2.1. DISTRIBUTION CHANNEL

Distribution channel is the paramount foundation of the competition and development of countries. Distribution channel includes transportation (logistics), communication and business-trade-commerce sub-units. Distribution channel also improves the productivity channel. The relationship between distribution and production channel is explicitly robust. According to Dirk Pilat on his research, Regulation and Performance in the Distribution Sector, he explained this relationship as: "*Productivity growth in existing stores has resulted from the increased use of self-service in many parts of the market, the use of information technology, improved management of inventories and modern management techniques.*"[26] Naturally, Dirk Pilat proved that to compete in local manner and global manner, distribution channel must be well developed. Different needs exist for consumers and producers because of rapid changes on information technology.

Digital context on sectors began with distribution channel, especially financial distribution segment by digitalization. Digital technologies lead the business development. New digital age presaged unknown exigence of customers so that digitalization, technology, creates processes of well-developed business and sub-units.

[26]Pilat, D. (1997), Regulation and Performance in the Distribution Sector, p.7

In transportation, technology determines the future of the metro, rail, road, air and automotive industries. According to Dale Benton, on Supply Chain Digital Newsletter, he explained the importance of technology on transportation "*…Transport and logistics companies have been embracing digital devices and innovations. Why? Quite simply, because they have helped to increase the bottom line, and are enabling business leaders to create a wider gap between their company and its competitors.*"[27] In distribution channel, as transportation and logistics sub-units, technology, digitalization, innovation lead following changes[28]:

1. Digitalization activated the date which is coming from information services. Information systems state the data to control and develop the logistics business processes. So that costs and efforts of operations will be reduced.
2. Digital logistics services are used for digitally developed multi-platforms so that trade and commerce is being growing and improving sector that meets the customer needs and digital competition rules such as fast-delivered products and control of transportation line.
3. New generation technology, so that digitalization, connected logistics systems and enables outstanding technological revolution such as drone trucks, digital / online file transfers, 3D painting and robotics manufacturing and logistics processes.
4. Digitalization created new term of product life cycle as "digital product life cycle". Usage of material is calculated by digital systems which are cadenced to transportation and logistics systems. The date is coming from this digital product life cycle to improve production, sales, commerce and customers' needs.
5. Capacity of logistics and transportation systems are measured by digital systems. Digitalization of transportation systems finds out inadequate pieces of the transportation systems and efficient ways to solve the problems and complete the missing issues of the systems.

[27]Dale Benton, 2016, Supply Chain Digital Newsletter, p.5-10
[28]Accenture Report, 2016, World Economic Forum White Paper Digital Transformation of Industries: In collaboration with Accenture, p. 1-7

6. For distribution channel, transportation plays significant role on digitalization. To satisfy customer needs, digital systems supply required time and complexity of customer demands because this digital system allows data collection for the distribution channel. Operation systems improved by new launched, multi-functional digital services. Digital services also created new business models for distribution channel.

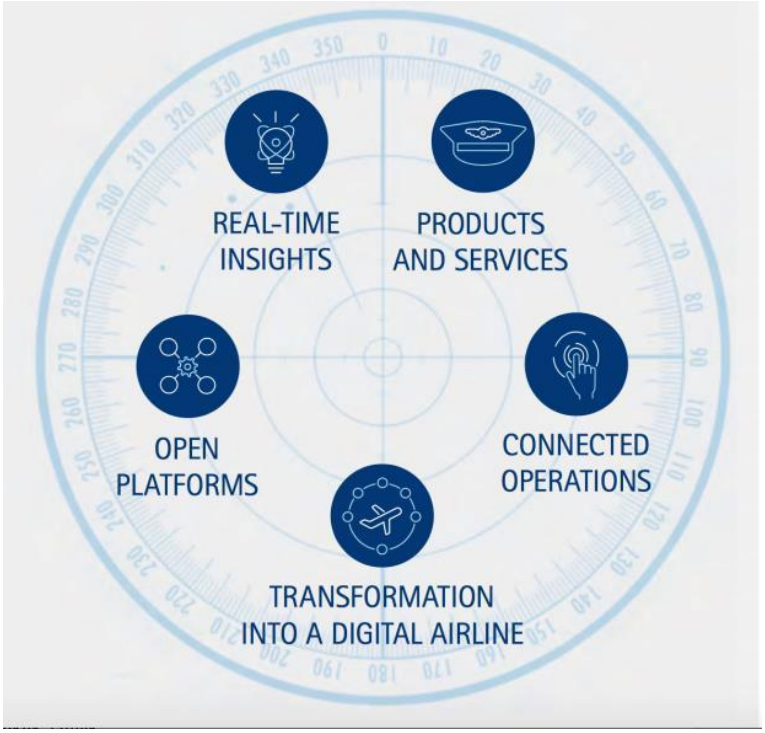
7. Digitalization added new value to transportation systems such as data warehouse, increased capacity of operations and production; enable multi-functional systems and faster and implemented customer benefits for developed business models.

Technological trends dispersed in customers rapidly. Web revolution exceeded expectations in the last decent. People questioned about what will be next. Mobile revolution came firstly. Now the digital systems are adaptable to multi-platform and multi-functional systems. Digitalization and new generation technology is everywhere in the industry. Distribution channel is not only important for logistics but also important for airlines.

According to Accenture report, Airlines explains how important digitalization is as :*"It is hard for many people to remember what air travel was like before the digital revolution. In the last decade, the growth of the Internet, multiple digital channels—and the disruptors with business models that leverage them—have had a profound effect on the industry. Travelers once had to rely on a travel professional to find and compare all of the best airfares and schedules. But what was once hidden is now out in the open. Companies like Expedia, Priceline, Hipmunk and Google Flights empower travelers to be their own travel agent."*[29]

[29]Accenture, 2016, Make Your Digital Connection: From Digital Strategy to Airline Strategy, p.6

Figure 8: Digitalization of Transportation - Airline Strategy [30]



In a big part of distribution channel, commerce became heart of the digitalization. E-commerce shaped every special area of human's daily life. People live their life in digital platforms. As technology increased, wearable device market showed outstanding results that can change e-commerce fate. According to UK Trade & Investment, beyond e-commerce to everywhere-commerce, importance of technology and digitalization on distribution channel stated as "*If the effect of mobile has been rapid it is likely the next generation of wearable technology will be even more dramatic. Not only will it create another channel for retailers but it will rebalance the way consumers shop for brands.*"[31]

Mobile devices changed customers and retailers habits. All digital devices that presented are sycnronhesized with each other so that customers and retailers can access anywhere, anytime they need even they cannot access in a physical manner.

[30] Accenture, 2016, Make Your Digital Connection: From Digital Strategy to Airline Strategy, p.3
[31] UK Trade & Investment, 2014, Beyond e-commerce to everywhere-commerce , June, p.5

Digitalization supplies virtual multi-channel platforms for communications, commerce and relationships between commerce and communication. Although it seems simple result, digitalization increased complexity of the digital distribution channel. Systems for optimizing customers and retailer's commerce and communications were created.

Advertising and brand awareness increased faster and spread rapidly. What is more, customers take ongoing support and advices from brands and other peoples by digital distribution platforms. Digitalization also added international value to commerce, communication and transportation.[32]

Following information shows digitalization of distribution channel success:[33]

* 2013 saw £32bn online retail sales in the UK, of which £4.2bn was to international customers
* China has the most online shoppers at 220m and the most internet users at 517m
* Consumer electronics, appliances and apparel account for 44% of online retail sales
* The UK has the highest share of online retailing in the world
* Mobile accounts for 14% of online sales in USA and 8% in Europe
* Global online retail sales have increased 17% yearly since 2007

Following figure shows that how digital distribution systems related with import, export and transportation systems that proved the numbers of digital distribution success:

Figure 9: Digital Distribution System[34]

[32]UK Trade & Investment, 2014, Great Retail E-Commerce, June, p.1-10
[33]UK Trade & Investment, 2014, Governent Report, p.10-12
[34]Amadeus IT Group, 2013, Technology and Distribution: Distribution customers, p.10

2.2. PRODUCTION CHANNEL

Production channel is the result of continues development of technological challenges caused by sectoral changes. Production channel includes banking (financial services, consumption, production, CRM analytics, and products), insurance, and engineering and law sub-units. Production channel is related to distribution channel as explained in the part of distribution channel.

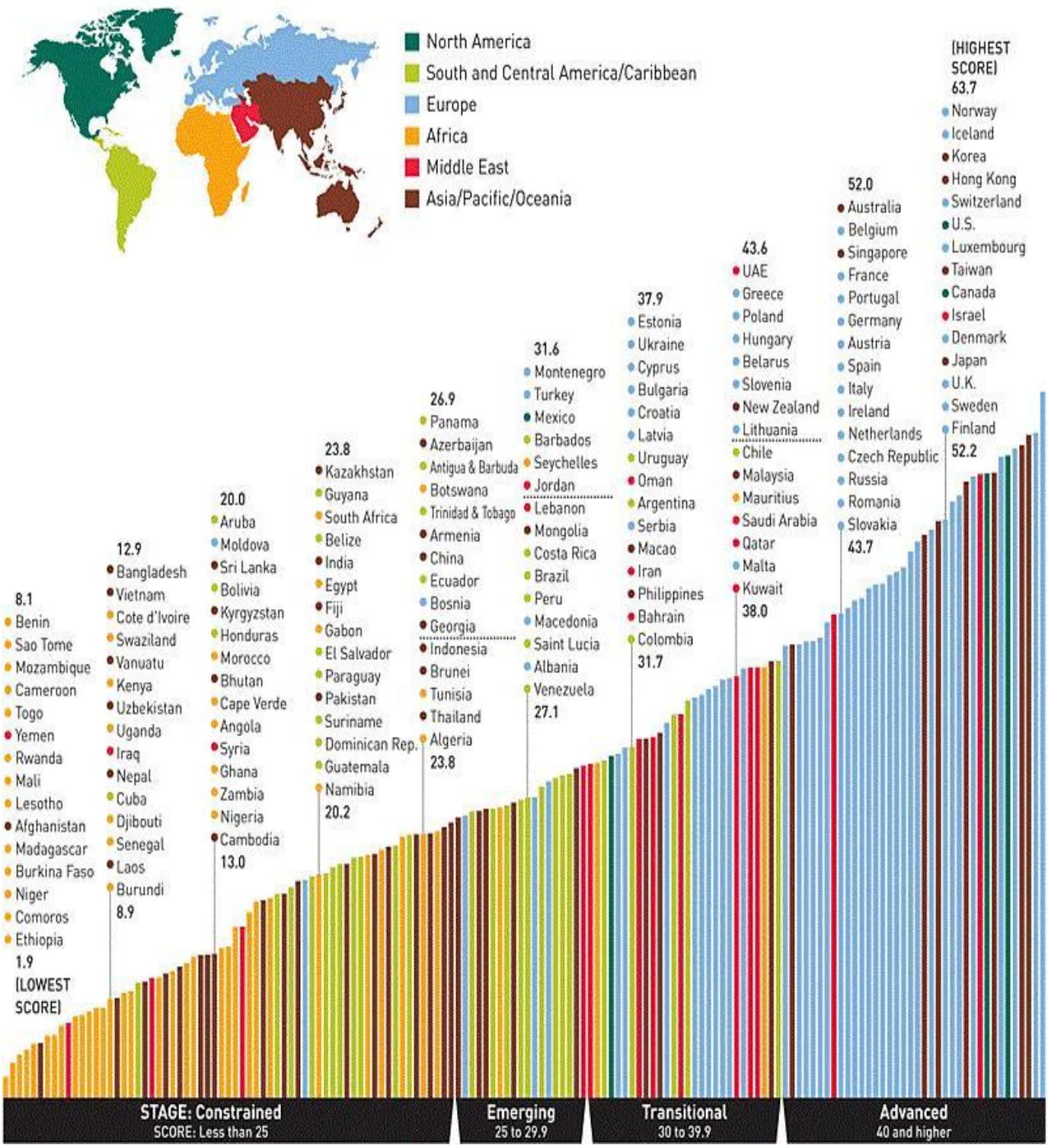
Many companies have to deal with digitalization by the way of law such as the time during access for any information, e-commerce, e-communication, saving and sharing digital resources etc. In addition, for online companies, rules are different and more complicated. These rules are not only for companies, it is for customers, too.

For example for transportation System there are rules for online check-in for both airline companies and customers and other related providers. In commerce System, during the online shopping and selling, both of providers and customers have to accept distance sales contract.

According to Booz & Company, it is the fact that sometimes it seems digitalization slow down the engineering sector. Conversely, technical challenges of production channel cause slow successful results. Digitalization procures faster solutions and automatisation for processes, solutions, production, distribution of production etc. Digitalization helps to improve new technologic ideas, practices for new technologies for production channel. Following Figure shows the world-wide range of the digitalization’s impact of production channel:

Figure 10: World-wide Digitalization[35]

The range of digitization scores for 150 countries shows that 65 countries are still in the constrained stage; 19 are emerging, 28 are transitional, and 38 have achieved advanced levels of ICT adoption and use.



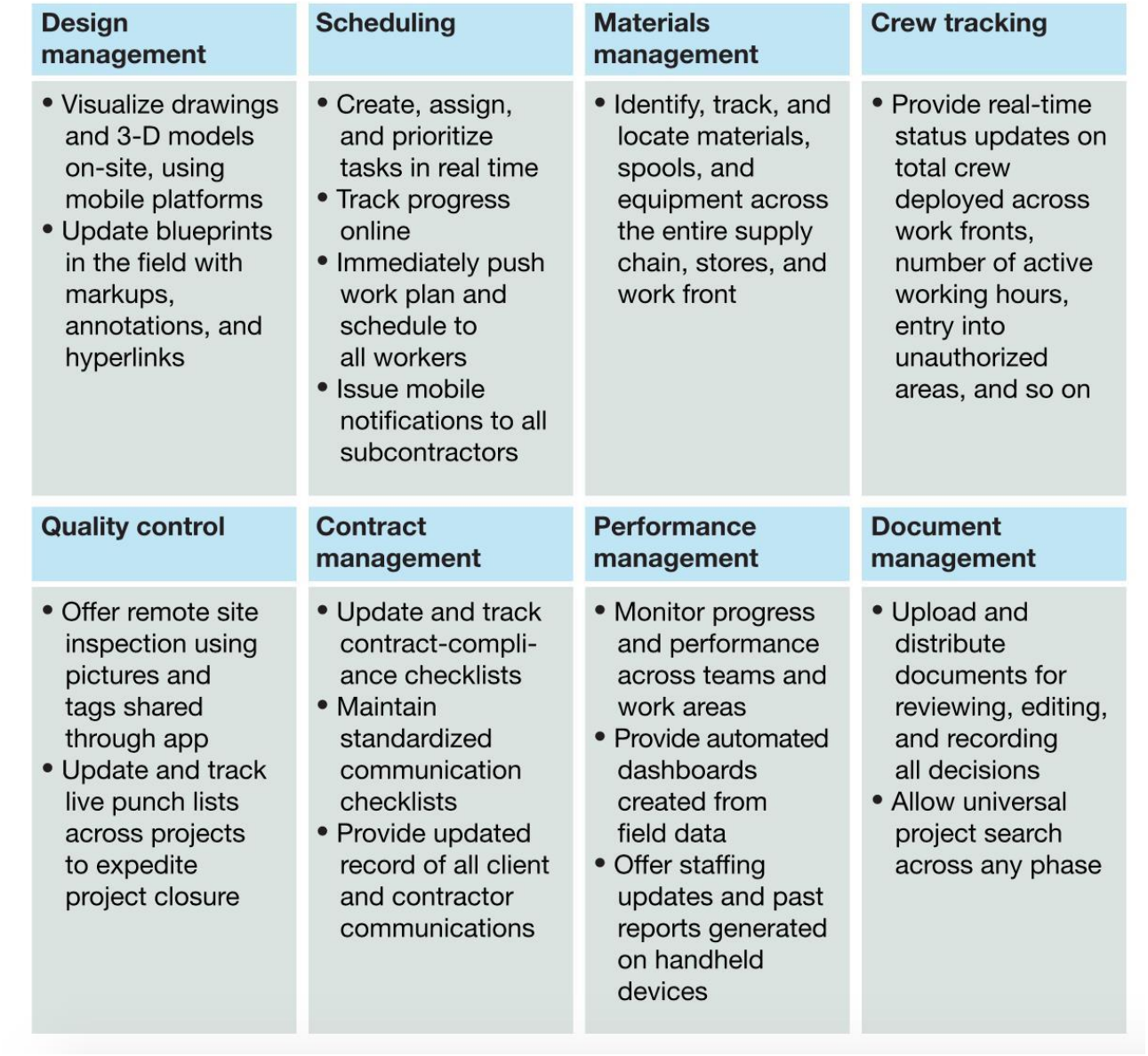
[35]Booz & Company, 2012, August, p.36

"*The construction industry, however, has yet to adopt an integrated platform that spans project planning, design, construction, operations, and maintenance. Instead, the industry still relies on bespoke software tools. In addition, project owners and contractors often use different platforms that do not sync with one another. As a result, there is no single source that provides an integrated, real-time view of project design, cost, and schedule.*"[36] Following Figure shows digital processes for production channel:

Figure11: Digital Processes for Production[37]

[36]McKinsey, 2016, Imagining Construction's Digital Future, June, p.22
[37]McKinsey, 2016, Imagining Construction's Digital Future, June, p.26

Figure 12: Design of Digital Engineering[38]



Design management	Scheduling	Materials management	Crew tracking
• Visualize drawings and 3-D models on-site, using mobile platforms • Update blueprints in the field with markups, annotations, and hyperlinks	• Create, assign, and prioritize tasks in real time • Track progress online • Immediately push work plan and schedule to all workers • Issue mobile notifications to all subcontractors	• Identify, track, and locate materials, spools, and equipment across the entire supply chain, stores, and work front	• Provide real-time status updates on total crew deployed across work fronts, number of active working hours, entry into unauthorized areas, and so on
Quality control	**Contract management**	**Performance management**	**Document management**
• Offer remote site inspection using pictures and tags shared through app • Update and track live punch lists across projects to expedite project closure	• Update and track contract-compli-ance checklists • Maintain standardized communication checklists • Provide updated record of all client and contractor communications	• Monitor progress and performance across teams and work areas • Provide automated dashboards created from field data • Offer staffing updates and past reports generated on handheld devices	• Upload and distribute documents for reviewing, editing, and recording all decisions • Allow universal project search across any phase

[38]MCKinsey, 2016, Imagining Construction's Digital Future, June, p.33

As a result, advanced digitalization created new term of engineering: "Digital Engineering". According to Voith (a digitalization company), the digital engineering exists because of needs. It is explained as: "*Digitization and interconnectedness change our lives and the way we interact and communicate. That refers to all aspects of our daily lives-nice to know: Each and every day, we send out more than 200 billion e-mails, ask Google about three and a half billion times, watch more than eight million video clips and share more than 700 million pictures at WhatsApp.*"[39]

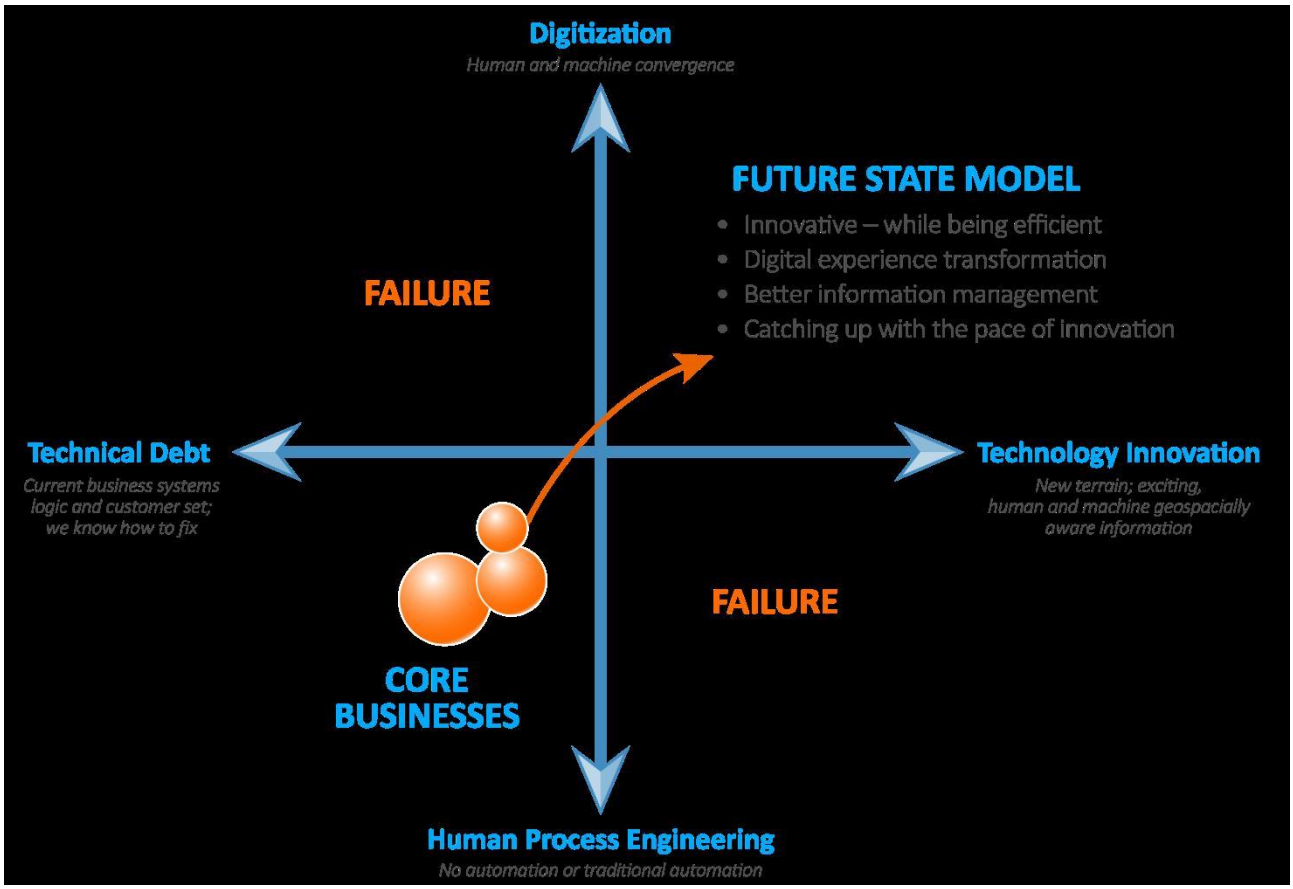
According to Mabey, a digital engineering company, digital engineering explained as "*The advent of digital engineering is transforming how 21st century construction and infrastructure is delivered.*"[40] In term of Digital and digitalization, technology is the heart of the world and it creates digital things just like internet of things. Anna Louise Wylie proved that as a team, technology must be condition to compare success of the business and processes because it is "*technology library*" for every user, both of customers and suppliers. She explained benefits of digital engineering and reasons of why digital engineering must be used in every sector according to following scale:[41]

- Digital engineering helps to increase confidence of project schedule, arrangement of operations, controlling of cost and quality.
- Digital engineering makes easier complex processes for all parties that uses the systems.
- By digital engineering it is easier to identify and test of elaborated challenges and their reformer solutions.
- Digital engineering significantly reduces the risks for projects and products.
- Thanks to digital engineering communication between suppliers and customers are better because digital engineering provides the systems that all processes of production systems to observe and estimate the state of affairs.

[39]Voit, 2016, Yearly Report p.12
[40]Mabey, 2016, Yearly Report, p.28
[41]Mabey - IBM, 2016, December Report, p.100-138

- Digital engineering must be part of the business for reliable asset management and planning to increase value of the assets and create the credible life-cycle of the capital expenditure and costs of operations.
- Digital engineering improves the management systems so that reputation of the brand and the company increases and market share, all of them help to compete concession for the company and the brand.

Figure 13: Digital Engineering[42]



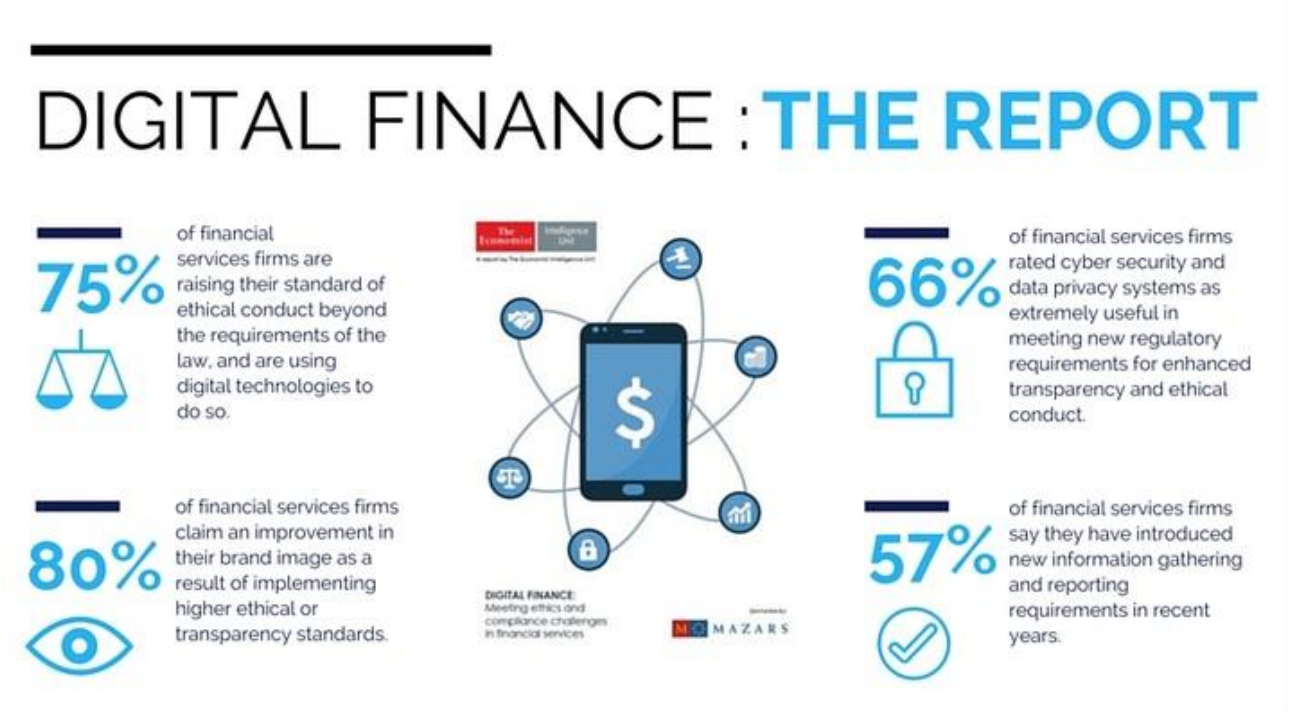
Financial services are other sub-units of the production channel. Financial services are critically engaged with law. The simplest explanation is that: Money is everything to live and finance is in there where ever people in there, or look, or interested in, etc.

[42]Mabey- IBM, 2016 December Report, p.189

To protect the country, people, assets, always money and law is there, briefly they cannot be separated. According to mobile POS provider companies reports : "*There are 263 mobile money services available across 93 countries, and nearly 300 million people are now registered to a mobile money account."..."With over 3 billion people connected to mobile services today, and another 2 billion expected to be connected by 2020, more people in emerging markets can now easily connect to mobile financial services quickly and–most importantly–securely*."[43]

When it is called security in terms of technology and finance, law is the first term that should be connection oriented term. To start with digital financial services it is said that technology is responsible for digital financial services and borders of the developments.[44]

Figure 14: Digital Finance and Law[45]



[43]John Giusti, 2016, January, GSMA
[44]Christine Duhaime, 2016, October, American Banker-Digital Finance Institute, p.34
[45]Economist, 2016, DIGITAL FINANCE: Meeting ethics and compliance challenges in financial services, p.28

Principles of financial digital services which are based on the rich experience reflected in G20 and international standard-setting bodies' standards and guidance. They also recognize the need to support innovation while managing risk and encouraging development of digital financial products and services. The detailed list they explained is given below[46]:

- Promote a Digital Approach to Financial Inclusion: As a priority to drive development of inclusive financial systems, including through coordinated, monitored, and evaluated national strategies and action plans.
- Balance Innovation and Risk to Achieve Digital Financial Inclusion: Balance promoting innovation to achieve digital financial inclusion with identifying, assessing, monitoring and managing new risks.
- Provide an Enabling and Proportionate Legal and Regulatory Framework for Digital Financial Inclusion: Legal and regulatory framework for digital financial inclusion, taking into account relevant G20 and international standard setting body standards and guidance.
- Expand the Digital Financial Services Infrastructure Ecosystem: Including financial and information and communications technology infrastructure—for the safe, reliable and low-cost provision of digital financial services to all relevant geographical areas, especially underserved rural areas.
- Establish Responsible Digital Financial Practices to Protect Consumers: Comprehensive approach to consumer and data protection that focuses on issues of specific relevance to digital financial services.

[46]GPFI (Global Partnership for Financial Inclusion), 2016,G20 High-Level Principles for Digital Financial Inclusion, p.11

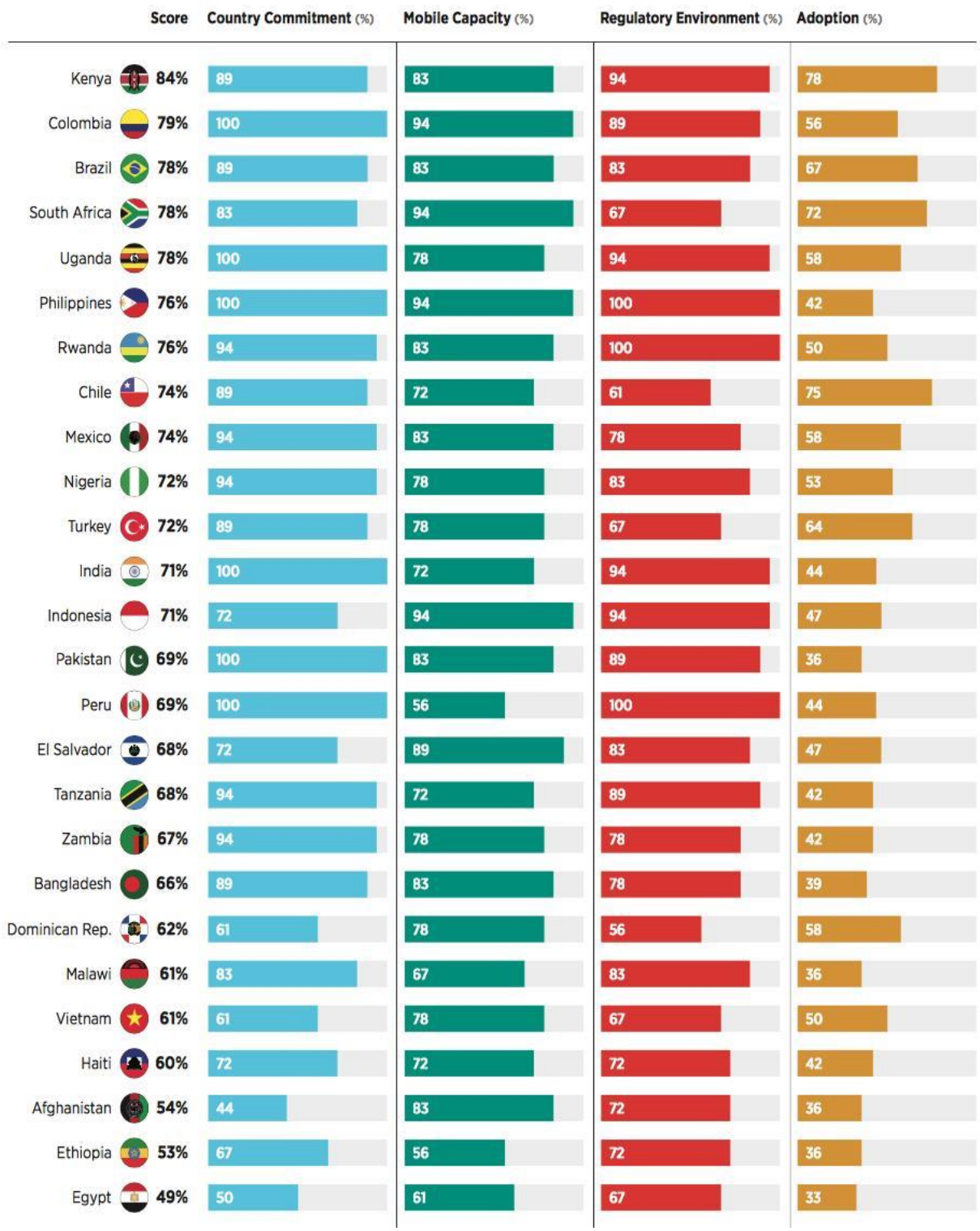
- Strengthen Digital and Financial Literacy and Awareness: Support and evaluate programs that enhance digital and financial literacy in light of the unique characteristics, advantages, and risks of digital financial services and channels.
- Facilitate Customer Identification for Digital Financial Services: By developing, or encouraging the development of, customer identity systems, products and services that are accessible, affordable, and verifiable and accommodate multiple needs and risk levels for a risk-based approach to customer due diligence.
- Track Digital Financial Inclusion Progress: Through a comprehensive and robust data measurement and evaluation system. This system should leverage new sources of digital data and enable stakeholders to analyze and monitor the supply of—and demand for—digital financial services, as well as assess the impact of key programs and reforms.

According to Centre of the Technology and Innovation, regulators should be in communication with private sectors suppliers, customer etc. because they are all in the financial inclusion of the assets, products and consume processes. Regulations must be shaped by all of stakeholders and customers to protect their boundaries, competition rights, consumer rights, supplier rights and others' barriers. It provides that digital financial systems are strongly attached to law (regulations).[47]

What is waiting for the future in terms of low is very complicated issue. Financial institutions proved the importance of digital-money which includes lots of regulations to prevent terrorism and all mechanisms that might be harmful for the financial systems. Level of risk must be low to reduce attacks and risks of the digitalization.Following figure shows that digitalization and regulations with adaptation of users and includes comparison of countries by the meaning of digital financial services and law attached together.

[47]John D. V, Darrell M. W, Robin J. L., 2016, BROOKINGS FINANCIAL AND DIGITAL INCLUSION PROJECT REPORT: Advancing Equitable Financial Ecosystems, p.22

Figure 15: Digital Financial Services and Regulations[48]



[48]John D. V, DarrellM. W, Robin J. L., 2016, BROOKINGS FINANCIAL AND DIGITAL INCLUSION PROJECT REPORT: Advancing Equitable Financial Ecosystems, p.6

According to Bloomberg, following Figure explained that regulations never end in digital financial services because in terms of technology and finance, it is not possible to separate law (regulations) to improve and develop the systems for all of the countries, companies, suppliers and consumers.

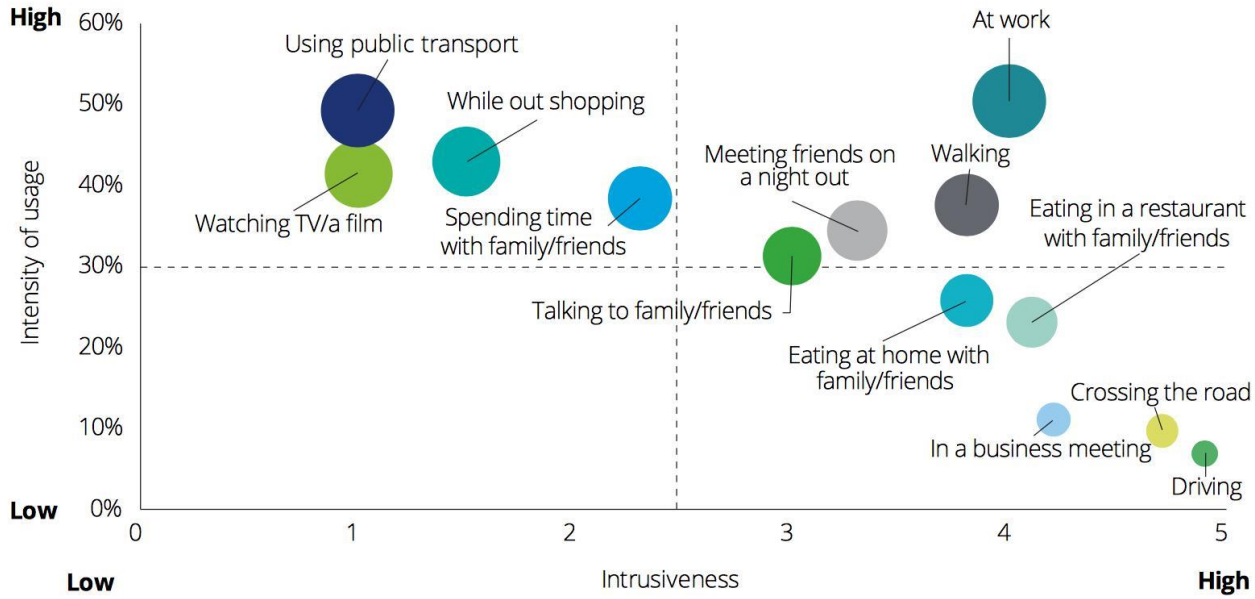
Figure 16: RegTech- Technology Regulations[49]

[49] Bloomberg, 2016, Fintech&Regtech, p.28

2.3. SOCIAL & PERSONAL CHANNEL

Social and personal channel is occurred as a result of people with social issues like education, health, government systems,etc.It also includes digital home systems, food, sport, and maintenance and fun sub-units. However, sub-units seems not related with digitalization, the fact is digitalization is mostly related to consumer behavior, personal habits and daily life routines. Following Figure shows how social and personal channel affected by digitalization:

Figure 17: Digitalization in Personal and Social Channel[50]



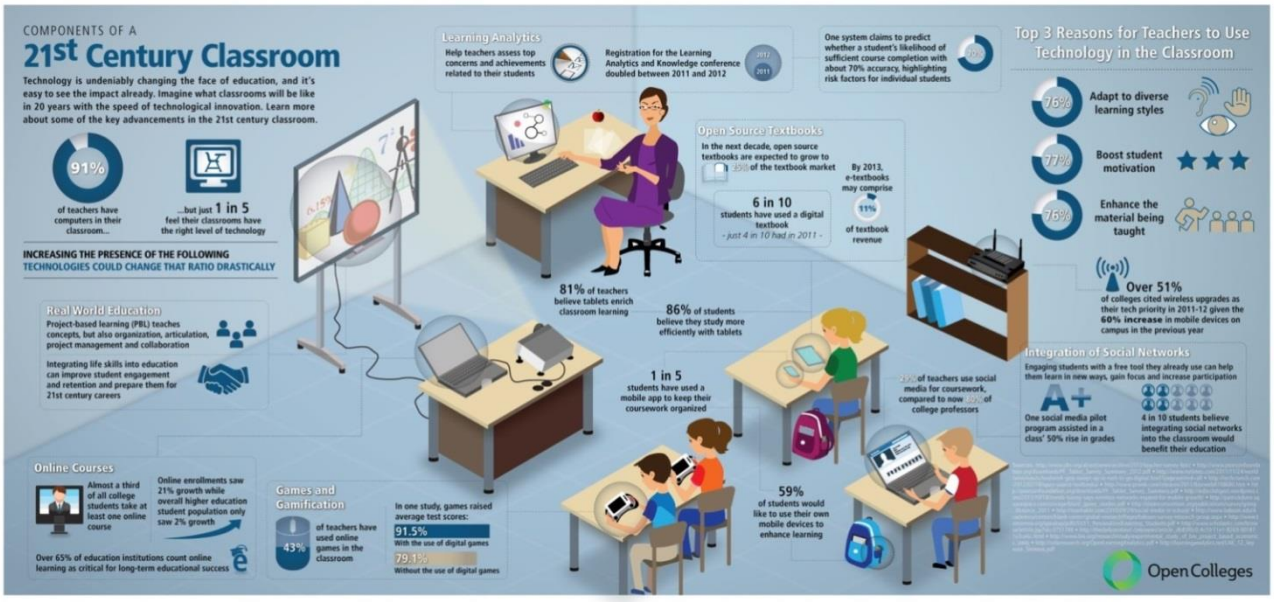
Note: The 'Intensity of usage' axis and size of the bubbles represent a weighted average for the indexed frequency with those that 'always' do that activity rated 1 and those that 'never' do the activity rated 0. The 'Intrusiveness' axis shows how intrusive the phone is for each activity
Weighted base: Respondents who own or have access to a smartphone (3,251)
Source: UK edition, Deloitte Global Mobile Consumer Survey, May–Jun 2016

Interesting term of digital education is related to supporting both of students and teachers for creating the future, digital skills and easy adaptation of technological devices that might surprise all the behaviors that people are used to do. New generation technology cannot develop without new generation livings.

[50]Deloitte, 2016, There's no place like phone: Consumer usage patterns in the era of peak smartphone Global Mobile Consumer Survey 2016: UK Cut, p.8

So what does it mean new generation livings? It is called as people who are similar to use new technologies with ease of adaptation and having fun to interest in new technologies and development of systems by these technologies. For a country, people must be developed before the systems so that they can involve in developing and maintaining the systems and solving the problems in an efficient way. Education is the basic but most significant stage of the development of people and countries. Digitalization in education systems must be challenging but it is never results with failure when it is supported for real development of people. Fallowing figure shows that how digital education systems are changed from traditional one with increased social and personal skills provided by technology and digitalization:

Figure 18: New Generation Education[51]



In the classroom, schools, most of digital activity shapes people's lives. Following figure explained that digitalization in education is not only adopting new technologies it is also socially and actively manipulating the habits both of social, personal and learning habits. Thanks to these digital activities, students meet their learning needs by using digital tools and more interested in learning, being active in the classrooms, and present their characters.

[51]Richard Straub&ElmarHusmann, 2017, Advances in Digital Education and Lifelong Learning, p.350

Figure 19: Social and Digital Learning[52]

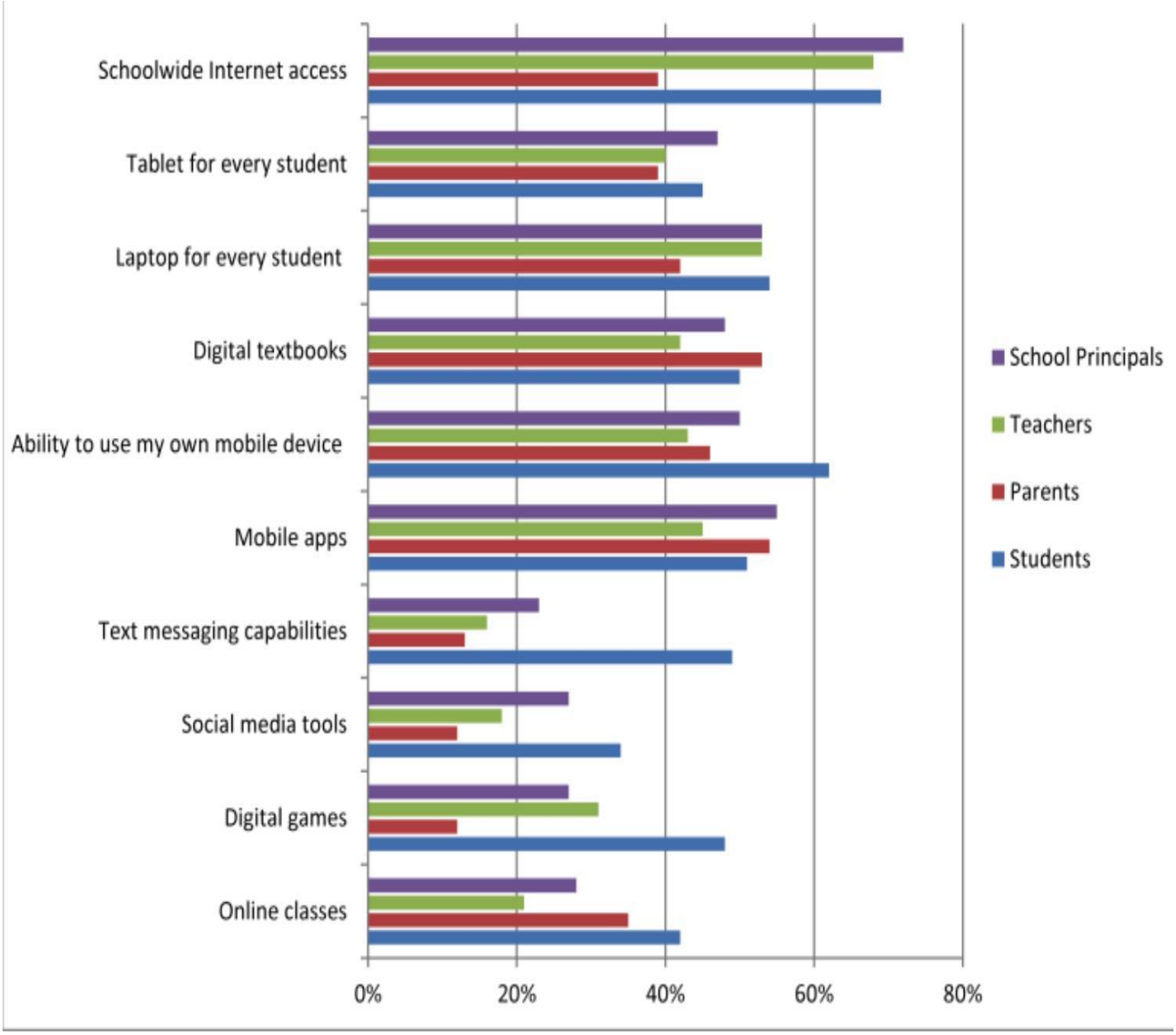
Digital Activity	Girls		Boys	
	Advanced Tech User	Average or Beginner Tech User	Advanced Tech User	Average or Beginner Tech User
Text with classmates	75%	73%	66%	60%
Take photos of assignments using mobile device	57%	49%	44%	35%
Find videos to help with homework	51%	41%	43%	32%
Use Facebook to collaborate on projects	43%	35%	33%	24%
Skype or iChat with classmates	36%	28%	33%	21%

When it is about vision of the digital education, artificial intelligence shows how important is technological improvement on education systems. Students have to share their skills and develop unique digital skills according to digitalization. Schools have to put principles according to digital regulations and create common vision for the future. Both of parents, students, teachers, have to know that their behaviors affect the technological development and shared digital vision of firstly the school then the future.

Critical issue is personal life have to be separated from professional life. It is harder when digitalization is not used properly in the content of principles and rules. Wide perspectives and ethics should be explained well, when it is called especially in education.

[52]Project Tomorrow, 2014, The New Digital Learning Playbook: Understanding the Spectrum of Students' Activities and Aspirations, p.28

Figure 20: Digital Learning Visions[53]



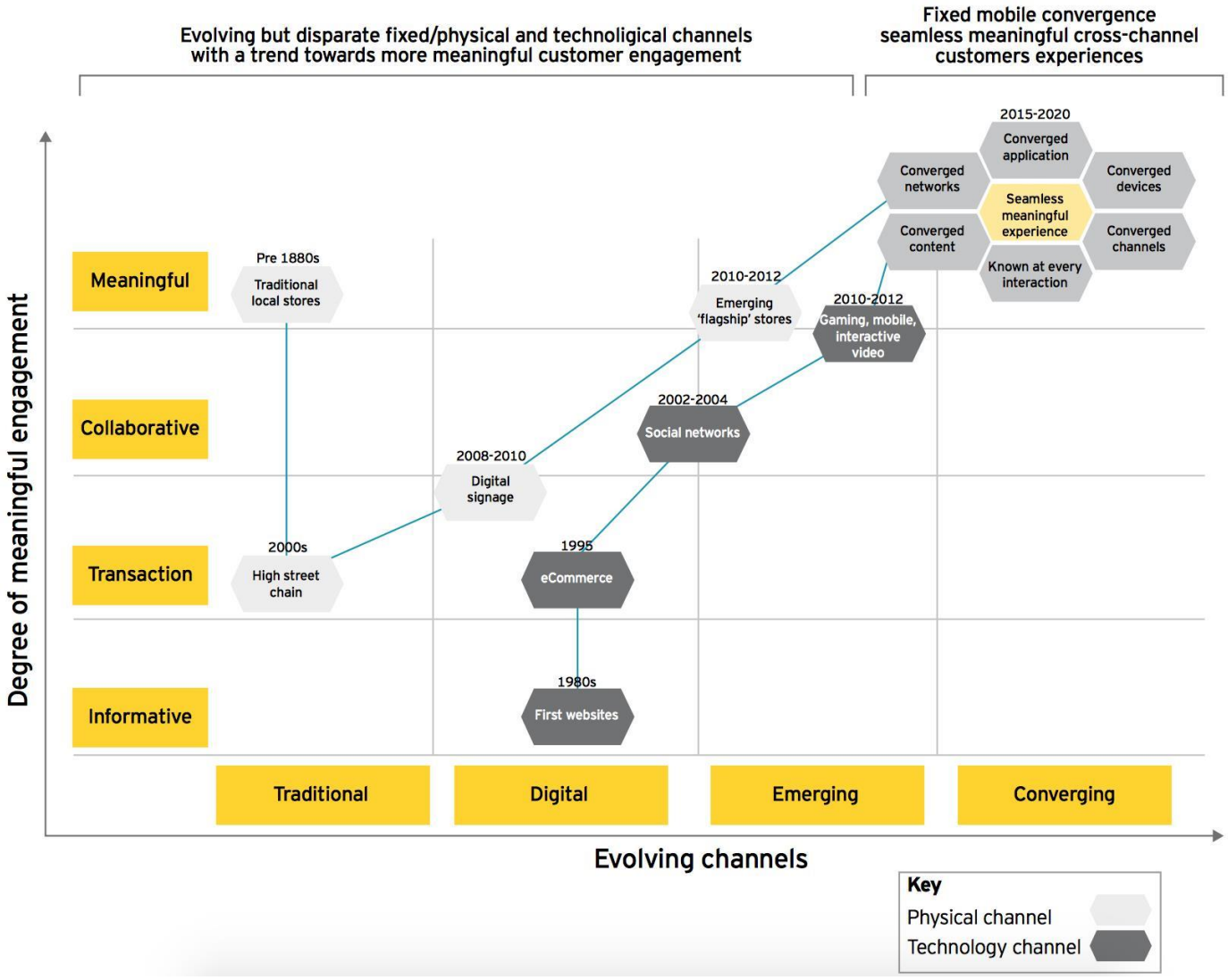
In addition to digital education, consumer behavior must be changed by the digitalization. Digital companies creates digital channels to add value to their customers, deliver systems to provide better experience overall.

For example, web based retailers present their mobile applications to create better customer experience and being more digital channels.

[53]Project Tomorrow, 2014, The New Digital Learning Playbook: Understanding the Spectrum of Students' Activities and Aspirations, p.86

A big technology company Apple, uses the mobile Point of Sale terminals to add the convenience of ‘click to pay’ to their physical shopping experience and provide customers with an email receipt from the POS terminal. Other companies which are in competition by the meaning of digitalization must be engaged with the digital models to be incorporation with the technology and adaptation. These digital channels help faster and easier feedbacks from the customers.

Figure 21: Digitalization in Consumer Behavior[54]



[54]EY, 2016, The digitisation of everything: How organisations must adapt to changing consumer behaviour, p.3

A structured approach to planning transformation must be applied to the system because challenge must be increase by the digitalization. So that new generation technology requirements can be developed in the right conditions. Following figure from Ernst & Young Digital Diagnostic Model and Approach (Source: Ernst & Young model) shows digital maturity using major dimensions: customers, suppliers and partners, investors, employees and leadership.

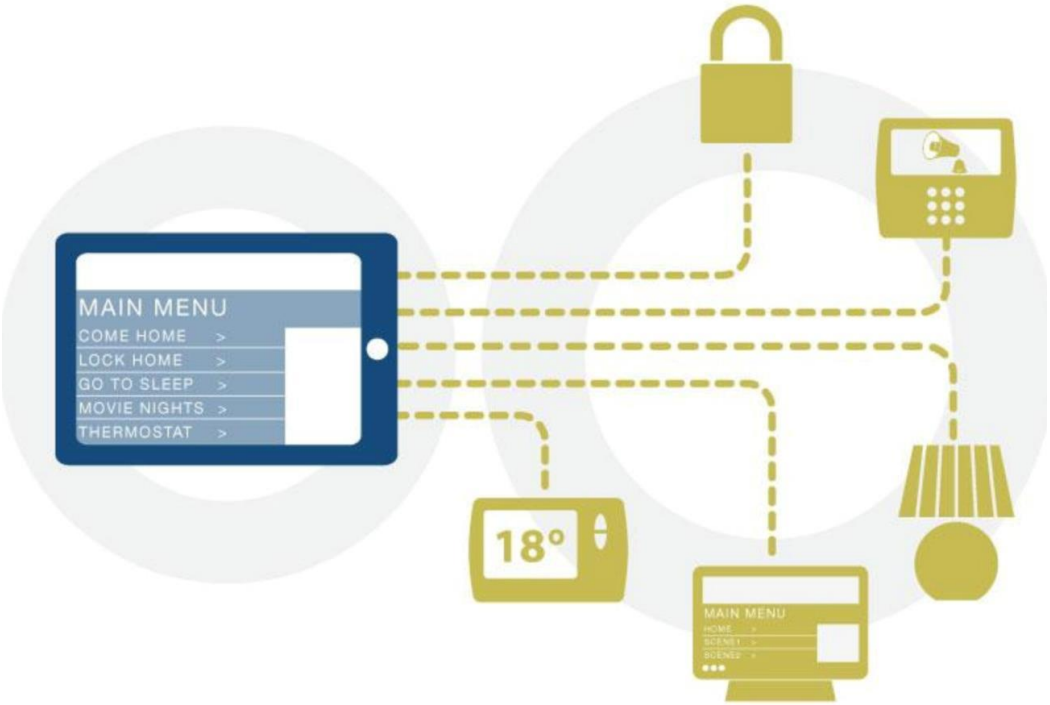
Figure 22: Digital Company & Consumer Behavior Strategy[55]

[55]EY, 2016, The digitisation of everything: How organisations must adapt to changing consumer behaviour, p.18

Another interesting social personal channel sub-unit is smart home technology. It is defined as "*What if all the devices in your life could connect to the Internet? Not just computers and smartphones, but everything: clocks, speakers, lights, door bells, cameras, windows, window blinds, hot water heaters, appliances, cooking utensils, you name it. And what if those devices could all communicate, send you information, and take your commands? It's not science fiction; it's the Internet of Things (IoT), and it's a key component of home automation and smart homes*".[56]

Smart home systems works with devices like Z-Wave, ZigBee, Lutron Clear Connect, Kidde, Bluetooth, and Wi-Fi etc. It is called as digital, new generation future. That includes just about everything in the smart home spectrum, for example from Philips Hue lighting and the Netgear Arlo camera, to Google Home. It must be user friendly, wide-range supported by the other systems.

Figure 23: Digital- Smart Home Systems[57]



[56]Eric Griffith, 2017, The Internet of Things lets you automate your home and monitor it from afar. Ready to dive in?, para.2
[57]Eric Griffith, 2017, The Internet of Things lets you automate your home and monitor it from afar. Ready to dive in?, para.18

According to smart home systems, thanks to digitalization and the technology, people can control lights, electrical outlets, fans, shades, drapes, irrigation, thermostats, security systems, door locks and more. Depending on the system selected, people can control your home from a wireless key fob on the couch, a wall-mounted keypad in a bedroom or via Internet connected smart devices such as smart phone, tablets, computer from anytime and anywhere in the world.[58]

[58]John Sciacca, 2014, Smarten up your Dumb House with Z-WAVE Automation, p.6

3. FINANCE AND DIGITALISATION

Finance and Digitalisation includes following units which are explained in this part:

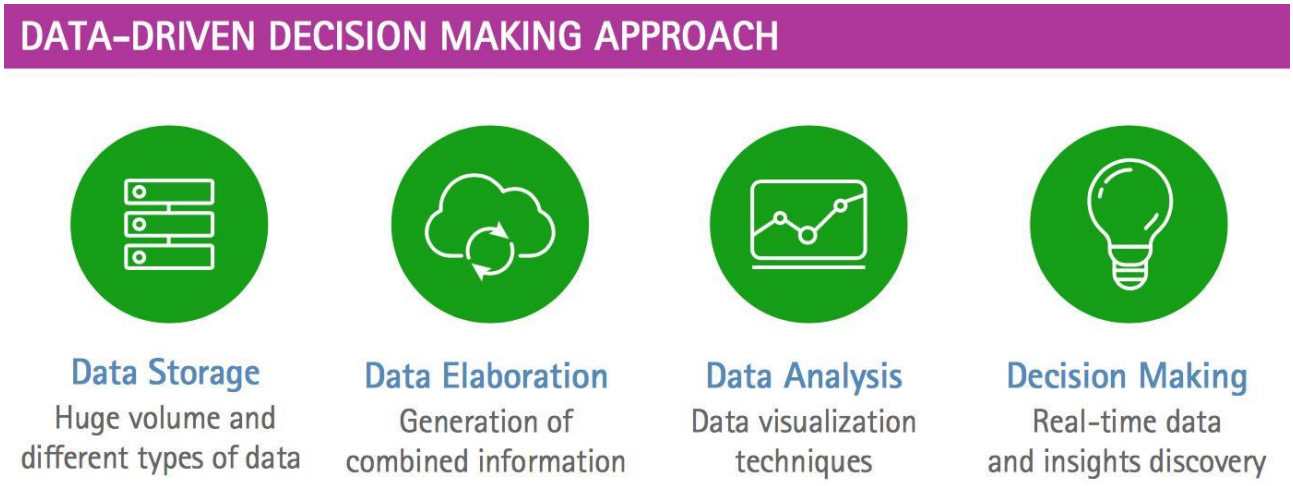
- New Generation Technology in Finance
- Digital Economy
- Digital Banking

3.1 NEW GENERATION TECHNOLOGY IN FINANCE

New generation technology proved that technology in finance changes the world. Of course firstly financial service providers affected such as 2008 economic crisis, 2014 technology revolution etc. According to Accenture, *Exploring Next Generation Financial Services*, it is explained as: "*The adoption of advanced technologies and capabilities to extract insights and add value from newly available data is bringing change to leadership roles within financial services firms.*"[59]Moreover they stated benefits that new generation technology provided in finance sector as: data-driven decision making, discovering new business opportunities, enhanced productivity and efficiency, risk and regulatory management.

Following figure shows how data-driven decision making create benefits for the financial services firms:

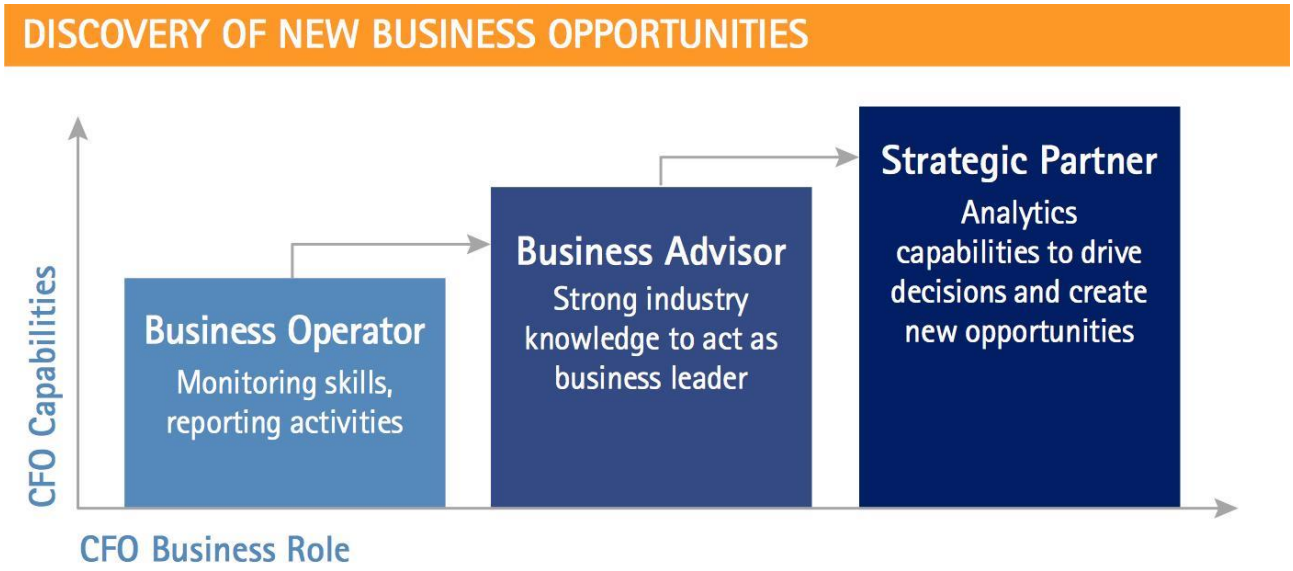
Figure 24: Data Driven Decision Making for Financial Services[60]



[59]Accenture, 2016, Exploring Next Generation Financial Services, p.4
[60]Accenture, 2016, Exploring Next Generation Financial Services, p.8

According to data driven decision making approach, financial service providers must have to data storage systems to protect and use the data. In addition, data elaboration is a must to integrate multi-platforms systems. Moreover, data analysis shows outstanding results of digitalization in finance so the decision making for the next generation competitive.

Figure 25: Business Opportunities for Financial Services[61]

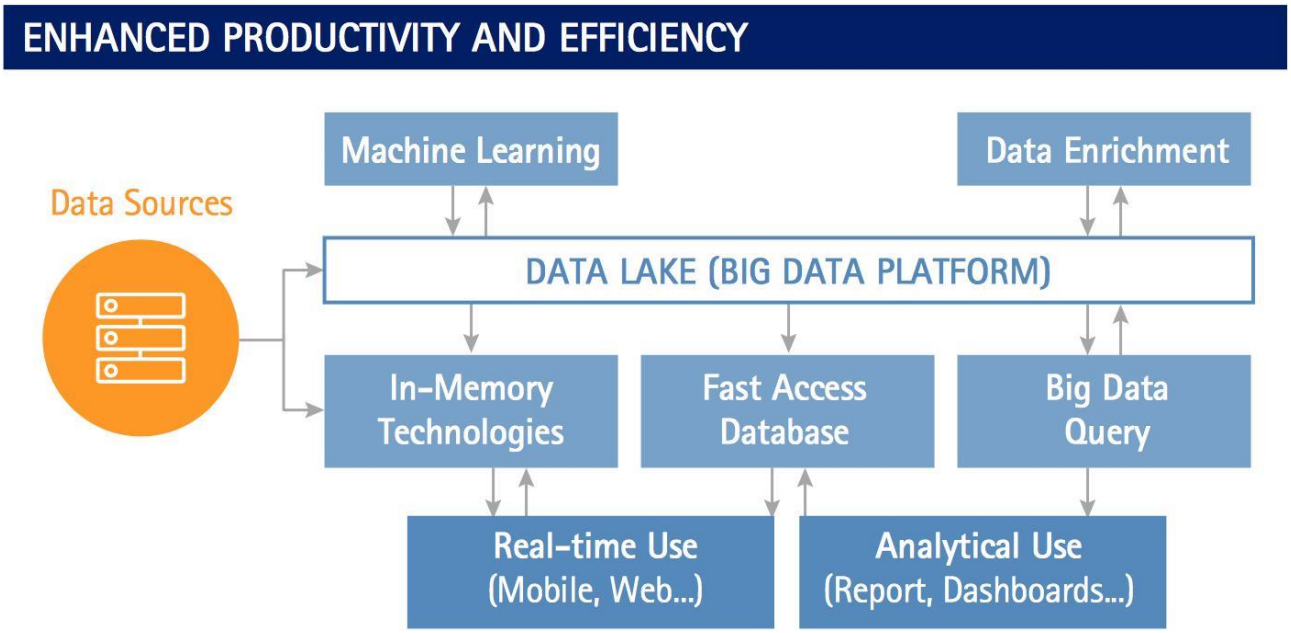


According to new generation technology effects on finance, another benefit is creating new opportunities for business. New generation technology constitutes world-wide range functions for financial service providers. Creating new opportunities for business infers controlling, monitoring and planning for these functions.

Business leaders, such as CFO, CTO, GM, shareholders, etc., obliged to think about new business opportunities to create high level profit to the company. New generation technology impacts the company greatly in the mean of strategy and competitive level which displays differently in every sector such as distribution, production, social and personal channel that explained before.

[61] Accenture, 2016, Exploring Next Generation Financial Services, p.8

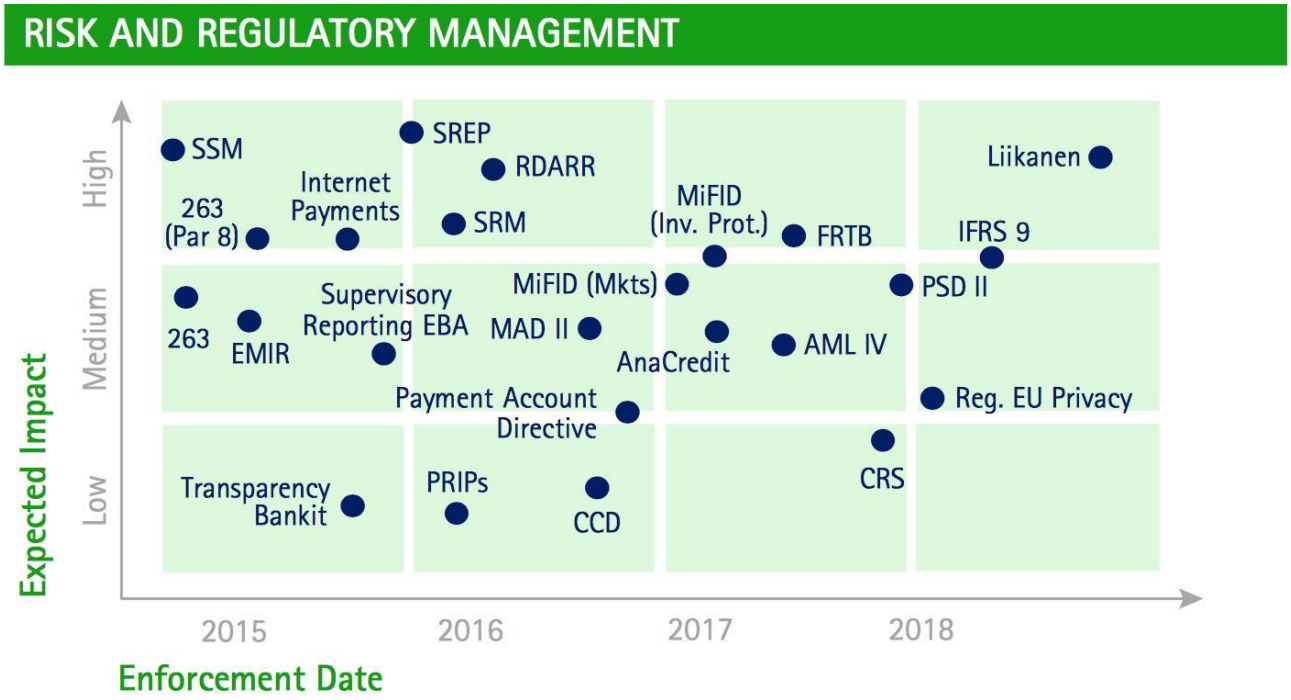
Figure 26: Enhanced Regularity and Efficiency[62]



According to enhanced productivity and efficiency model, new generation technology on finance changed the data model which used to transform the data,analyze the data, data accessibility, machine learning and data sources to create financial service provider models. This process is cardinal part of the financial services because data is heart of the finance that outputs the every transaction performed. So what is the financial data? According to Global Financial Data, Institute of Financial Service Providers, "*Financial data consists of pieces or sets of information related to the financial health of a business. The pieces of data are used by internal management to analyse business performance and determine whether tactics and strategies must be altered.People and organisations outside a business will also use financial data reported by the business to judge its credit worthiness, decide whether to invest in the business, and determine whether the business is complying with government regulations.*"[63] Briefly, this explanation proved why the data is the heart of the financial services.

[62]Accenture, 2016, Exploring Next Generation Financial Services, p.10
[63]Global Financial Data, Institute of Financial Service Providers, p.8

Figure 27: Risk and Regularity Management[64]



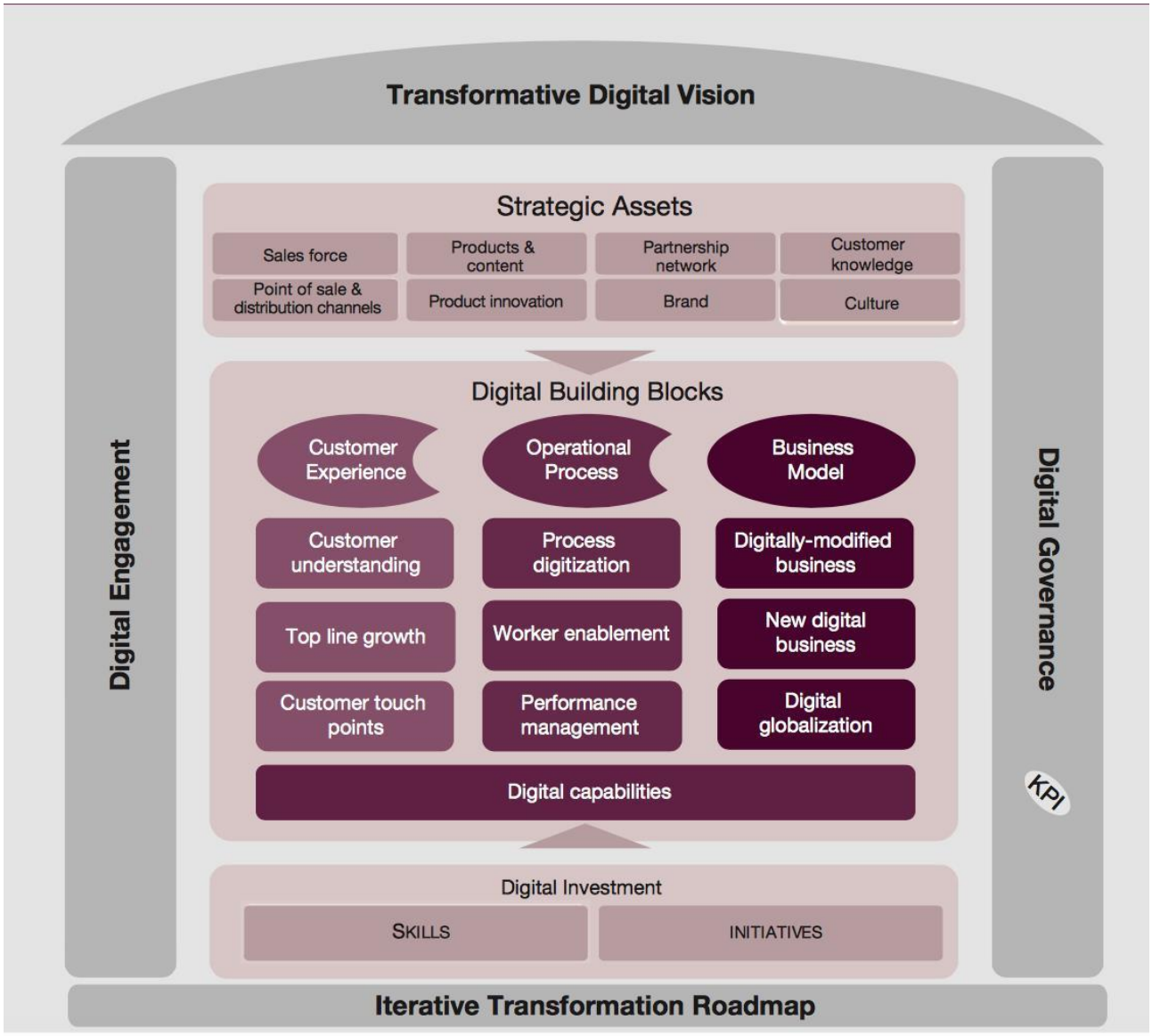
Data and information, leads regulatory reporting so that risks and regulations are well managed for business. Some of the data and information must be protected robustly so that regulations must be put in use for security. Financial service providers are responsible to protect the data and provide security of personal information. Every possible risks and security attacks are related to data of risks and regulatory. That's why new generation technology must be implemented by well-designed data models and security systems proper to regulatory.

[64] Accenture, 2016, Exploring Next Generation Financial Services, p.12

3.2 DIGITAL ECONOMY

Digital economy is new generation technology effect on finance and governance. Digital economy is also explained as new generation technology which leads growth opportunity. For example very specific categories are observed such as AI (artificial intelligence), new generation technology data (big data models, data analyzing, reporting, data risks, data automation), 3D printing, digital engineering, digital finance etc. Digital economy is the source of opportunities so that digital economy has a strategy and a management system.

Figure 28: Digital Economy Strategy: Digital Governance[65]

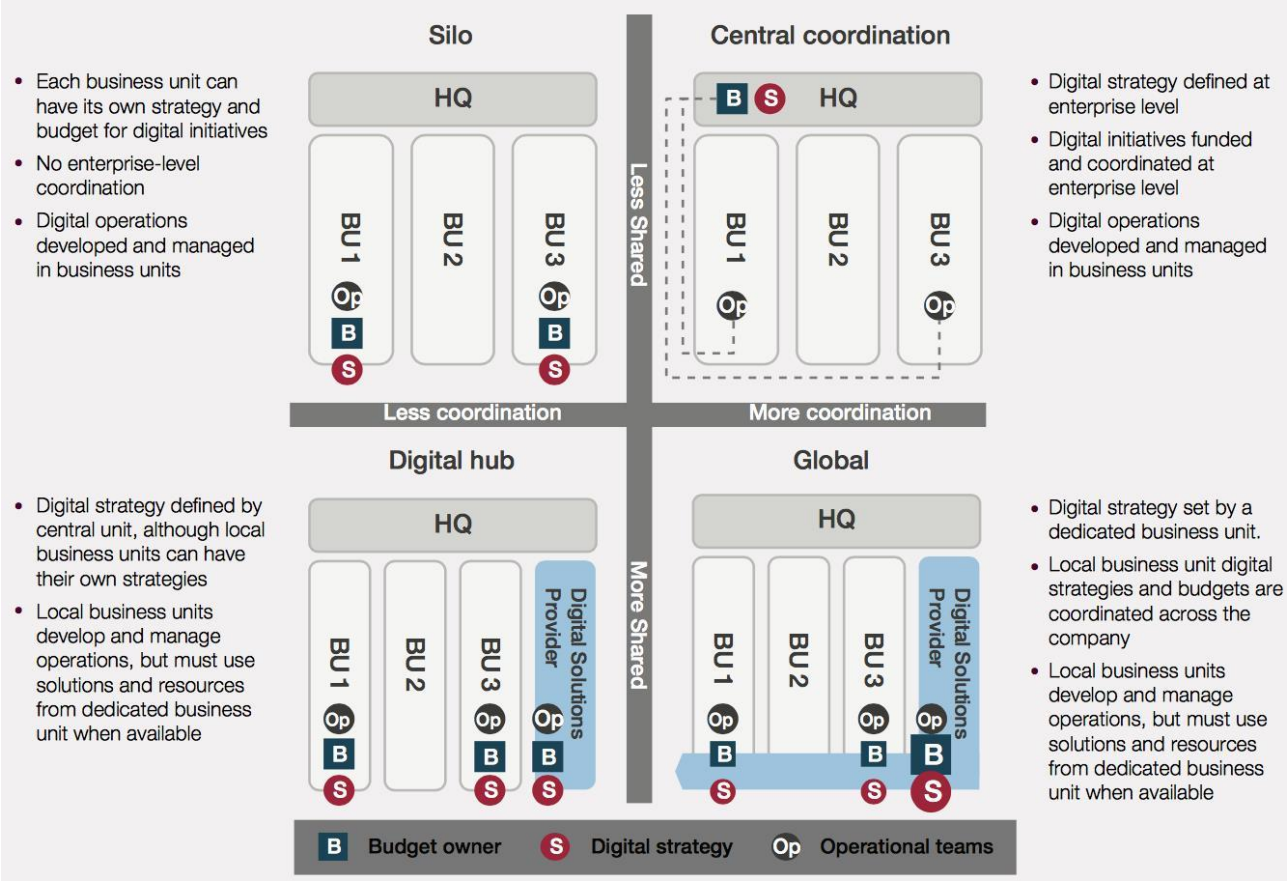


[65]MIT Center for Digital Business and Capgemini Consulting, 2011,DIGITAL TRANSFORMATION: A ROADMAP FOR BILLION-DOLLAR ORGANIZATIONS, p.47

Digital governance shaped every transaction performed in daily life. Digital governance explained by Lisa Welchman as: "*Digital governance is a discipline that focuses on establishing clear accountability for digital strategy, policy, and standards. A digital governance framework, when effectively designed and implemented, helps to streamline digital development and dampen debates around digital channel "ownership".*"[66]

Digital governance includes optimizing costs so that operations are effective and productive. In addition everything is online by the new generation technology and financial service providers and companies have to satisfy online needs of business shareholders, employees and end users which are customers and employees.

Figure 29: Strategy of Digital Governance[67]



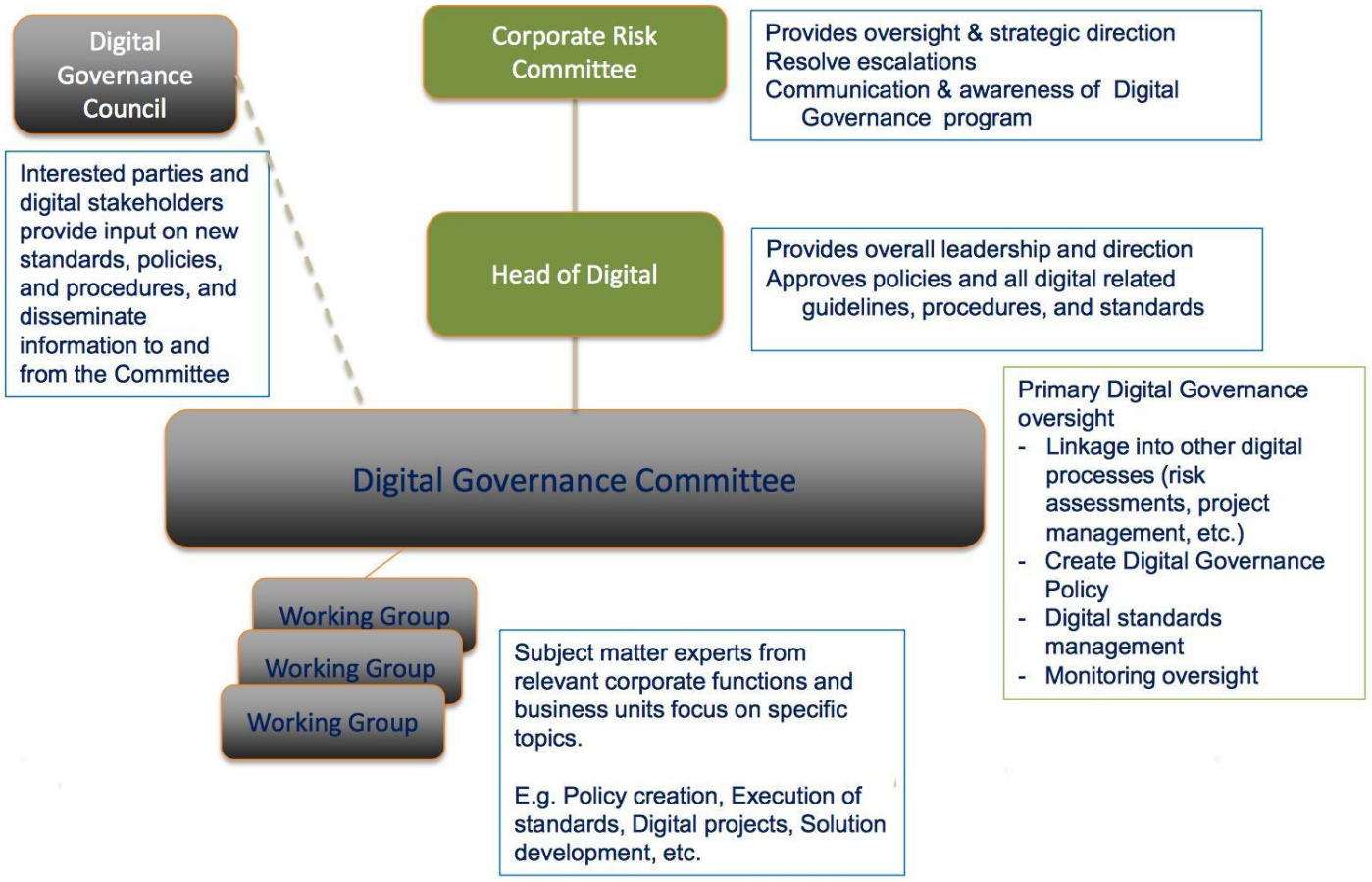
[66]Lisa Welchman, 2016, Managing Chaos: Digital Governance by Design

[67]MIT Center for Digital Business and Capgemini Consulting, 2011,DIGITAL TRANSFORMATION: A ROADMAP FOR BILLION-DOLLAR ORGANIZATIONS, p.54

Digital economy and digital governance is a challenge for companies because it requires digital management strategies to erase conflicted goals and replacing faults with right decision at the right time with new generation technology. Complex supply chain problems can be only sold by digital marketing and economic strategies by using smart devices and smart technologies which are the best solutions to have fast outcomes.

Following Figure shows how to implement digital governance strategy to survive with digital economy challenges. Committees and strategies are explained bellow:

Figure 30: Digital Governance Strategy[68]



[68]Stacy Wiedman, 2016, Building a Digital Governance Program, ISACA Geek Week p.16

According to digital governance strategy, there are digital standards which are coming from digital economy. Digital standards have four categories: Design, Content/publishing, Development and infrastructure, compliance.

- Design: Related to user experience, user interface, web design, copyrights and trademarks.
- Content/ Publishing: Related to brand, content management framework, language translation, domain management.
- Development / Infrastructure: Related to code standards for web, testing-release and change management, information security and digital architecture.
- Compliance: Related to privacy (GLBA- COPPA, ADA) industry specific audit rule, insurance, responsible for banking and financial services.

However, there are always risks for digital economy and governance strategies such as regulatory violation, legal violation, native public perception, customer dissatisfaction, customer liability, data breach, incorrect or inaccurate information, unavailability, etc.

Briefly, to cope with risks and profit for the company, digital economic strategies and digital governance roles must be specified for companies to survive their main role in the sector in terms of technological improvements and digitalization.

3.3 DIGITAL BANKING

As information technology is being larger by adding new features and opportunities on business of every sector, finance sector is affected by information technologies mostly. Finance sector faced with major changes during last 3 years. Improvements of technological developments changed business models and created new needs on finance sector, especially in banking sector[69].

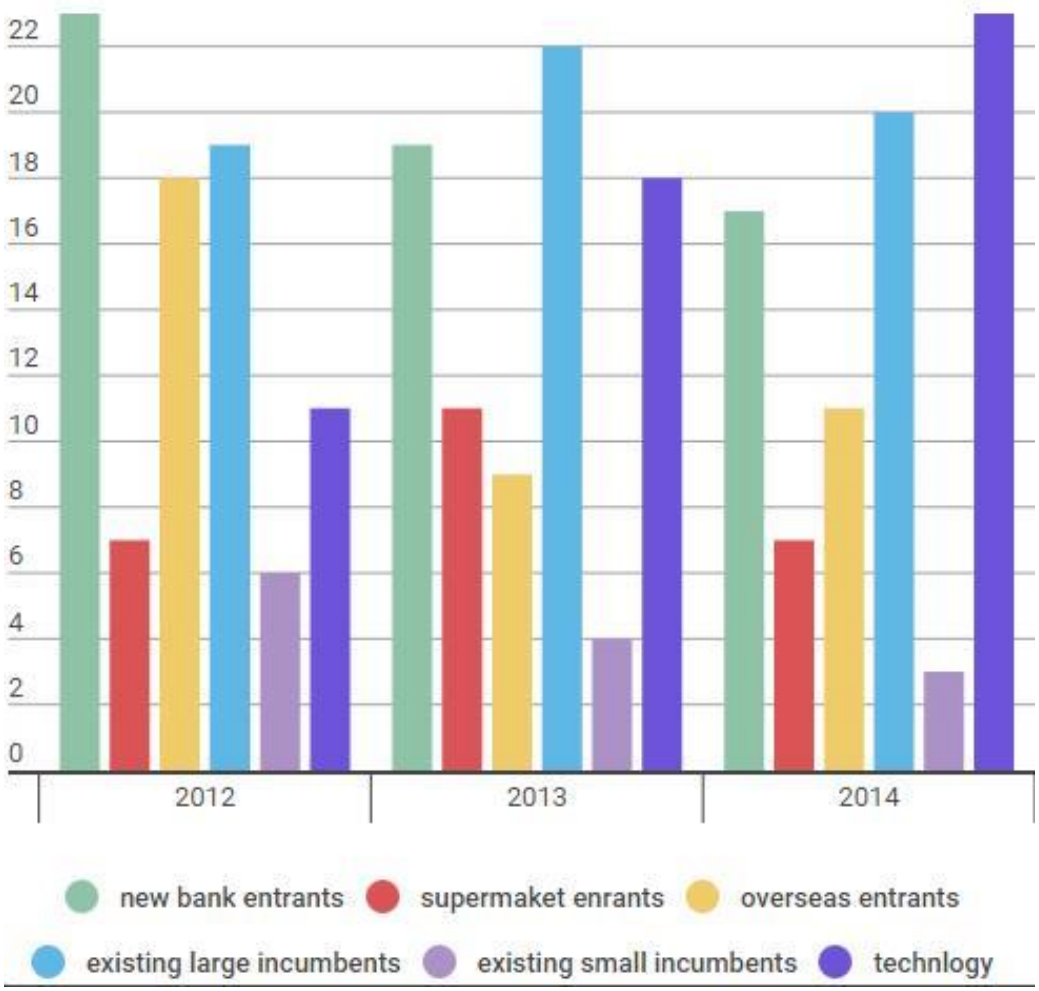
"The banking industry today is experiencing big changes, with banking becoming digital and more customers using mobile devices to conduct financial transactions."[70]So that finance sector changed and started to compete on digital banking branch. Banking sector added new values and opportunities for customers by electronic services and started to serve these features as mobile and internet banking.[71] For example, information technology provided 24 hour accessible banking systems to customers. Customers are able to access banking systems online today whenever and wherever they need. Moreover they do not have to use a computer, with smart phones, tablet PC's and mobile applications it became easier to make every transactions.[72] On the other side, financial institutions are not fast to adopt changes that information technology requires.

Customers always demand new features and new banking experiences with no time and no place conditions required. These changes are not easy for financial institution especially in banks, because it requires principal changes and improvements on digital banking systems. Risk is too crucial for banking business models for every change.[73]

[69]TommiLaukkanen, 2014, Business Process Management Journal, p.788
[70]Temenos, 2015, Microsoft Enable Application Innovation Report: Cusomer Solution Case Study
[71]Jonsson, S. and Gunnarsson, C., 2005, "Internet technology to achieve supply chain performance", Business Process Management Journal, Vol. 11 No. 4, pp. 403-17
[72]Coelho, F. and Easingwood, C., 2015, Journal of Financial Services Marketing, Vol. 8 No. 1, pp. 22-34
[73]AT Keaerney, 2013, Banking in a digital world- Digital Banking Journal, p.2

Following figure explains that information technologies have great impacts on finance sector, digital banking. Competitive segments of digital banking changed faster as soon as new opportunities in information technologies occurred. The figure proves that digital banking is very crucial today.

Figure 31: Finance Sector Competitive Threats by Yearly[74]



[74]Temenos, 2014, Microsoft customer success in the digital age, p.88

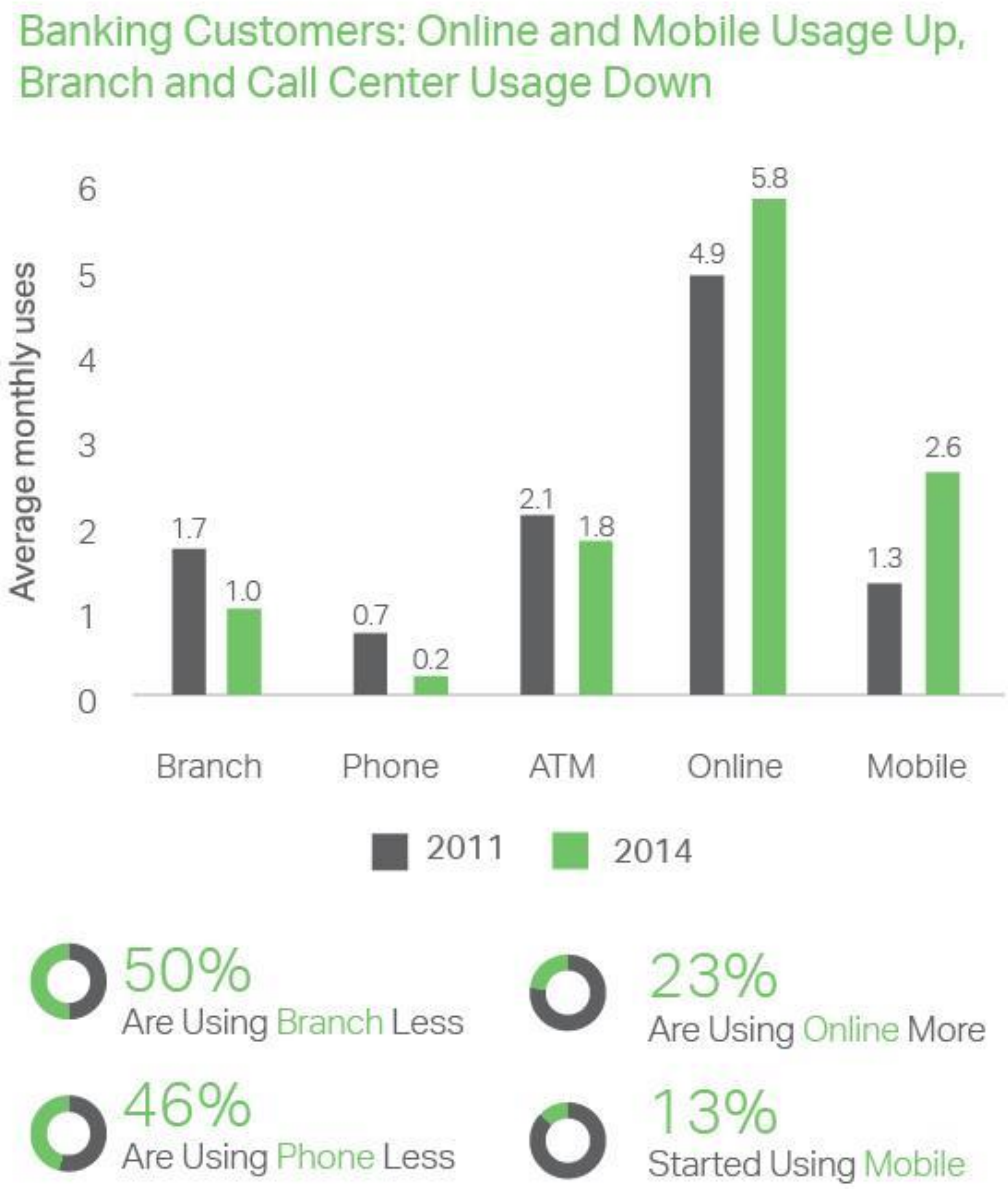
Challenges are not stable because technology keeps adding new features to system and mobile banking and mobile applications being a must for finance sector. Khawaja explained that "*Recent anecdotal evidence shows a dramatic shift in the behaviour of individuals wherein mobile phones are becoming the primary device for accessing many services such as news, videos, and more*."[75]

Mobile phones became primary need so that on both the internet and mobile banking segment started to require endless development.

However, digital banking segment survives with technological forces that affect whole business model of finance sector. In addition to crucial risks, problems are likely to increase on implementation of digital banking new models on old banking systems because digital banking usage is getting greater day by day. Following figure shows that usage of digital banking proved that traditional banking system will no longer survive in time and new features of digital banking have a great impact on finance sector.

[75]Khawaja Saeed, 2011, Understanding the Adoption of Mobile Banking Services: An Empirical Assessment, p1

Figure 32: Digital Banking Usage[76]



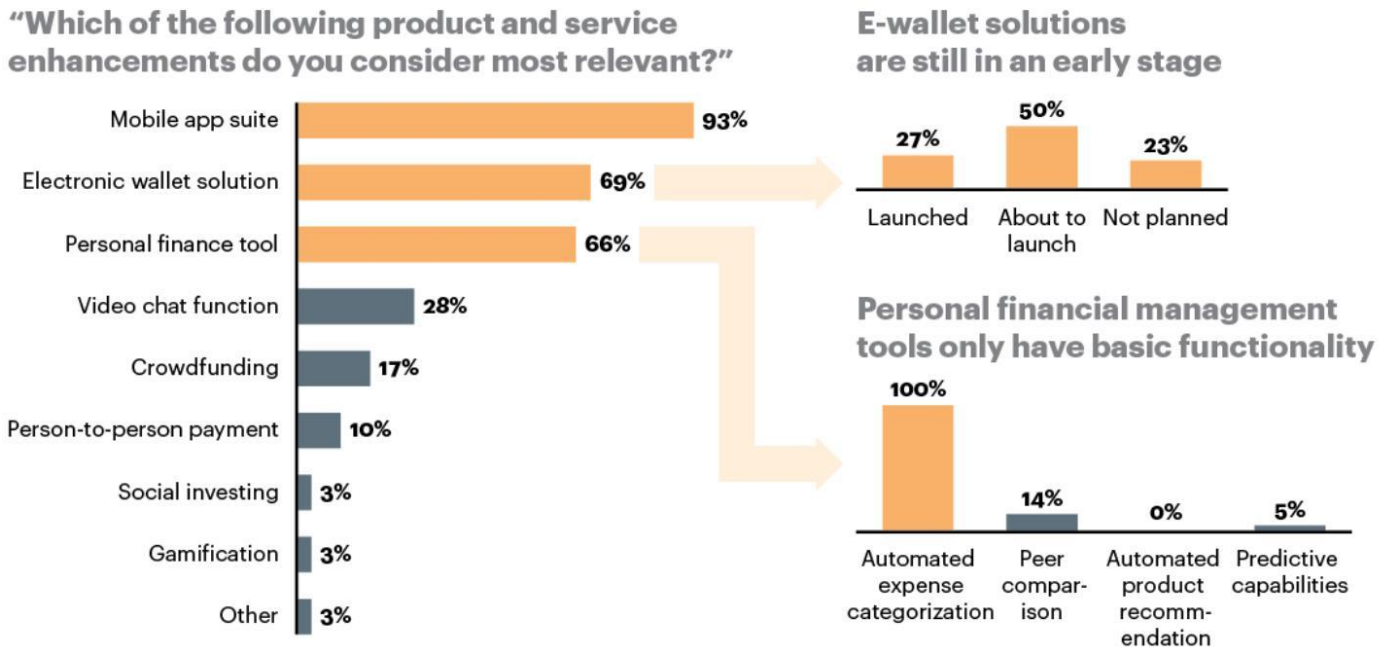
Problems on finance sector are not only technology relevant. One of the most essential arguments is about that digital banking and new features do not supply profit in a short time. On traditional banking business models, branches work for greater profit.

With technology based features, mobile and internet banking, profit is not first aim to achieve. Same search proves traditional banking systems are based on profits.

[76]Sean Williams, 2015, Business Journal, May

However digitalization does not let the traditional banking business model survive. Digitalization combats with traditional business model especially in finance, banking because bank branches should not be primarily responsible for profit and loss. Digitalization is the game changer, and put different rules in business. Competitiveness changed, world changed, and still digitalization shows continues development for the technology. Following figure shows how digitalization and new generation technology changed the digital banking by smart devices, new financial service providers; applications and all online transactions can be performed.

Figure 33: Digitalization and Digital Banking[77]



According to the hypothesis, there are too many factors that affect the digital banking such as security, consumer behavior (especially culture), complexity, compatibility, e-service quality, software quality etc. Limitations of digitalization should be considered.[78]

[77]Waleed Al-Ghaith, Louis Sanzogni, Kuldeep Sandhu, 2010 Factors Influencing the Adaptation and Usage, p.81
[78]Waleed Al-Ghaith, Louis Sanzogni, Kuldeep Sandhu, 2010 Factors Influencing the Adaptation and Usage, p.76

To understand how mobile and internet banking finance sector all factors should be analyzed and eliminated carefully. This research aims to explain these factors and find out effects of mobile and internet banking on finance sector, finally prove that digital banking improves finance sector.

A few years ago, traditional banking was the primary business model of finance sector. Technology forces the baking systems and financial business models for essential changes. Banks have to choose changes to survive in new modern business lifecycle. According to ZahirBokhari (Banking Leader, Deloitte UK), banks have to compete by technology and new futures in modern financial business sector.[79]

On the journal, it is explained that *new technology*created*new banking system*and added new features to old system by improving electronic financial services such as payments, loans, credit cards etc.

According to T. Sreenivas, on his book it is explained that old banking system was holistic but with digital banking it became personal banking.[80] His study shows that not only increasing in population makes the finance sector growth, wide development of technology affects it greater than all other factors.

On the other hand, Megan Durisin explained digital banking positive effects on finance sector on Business Insider Journal.[81] She argued about security, fees, virtual ATM issues, customer services, deposits, personal preferences etc. Her study states that digital banking is new segment but changed whole of the traditional banking business model and new age is improving finance sector.

[79]Deloitte, 2014, p.1- p.5, Banking disrupted, How Technology is Threatening the European Retail Banking Model
[80]T. Sreenivas, 2006, Banking Sector and Human Resources, Changing Scenario, p.46, p52
[81]Megan Durisini, 2013, Business Insider Journal, p.3

In addition, Nhat Nguyen stated that digital banking improves finance sector because digital banking includes new features of technology such as time saving, free usage, secure transactions etc.[82]Key concepts of digital banking given bellow:

- Smart Phones: technology feature added, connectivity and computing devices.
- Operating Systems: Software that can manage and control electronic devices especially smart phones.
- Applications: High level programmed software that run on specific operating systems.
- Mobil Banking: Banking system that users are allowed to access by using electronic devices.
- M-Payments: Allow users to do transactions related payments instead of carrying cash.
- Remote Deposit Capture (RDC): Service that allow users to scan or capture images and send to bank.

According to Nhat Nguyen, new banking processes play major role on changing banking systems. As new concepts (explained as key concepts) are added, finance sector have to be improved to survive new conditions of technology.

[82]Nhat Nguyen, 2014, Potential of developing and using mobile banking apps in Vietnam, p.657

4. EXPLANATION OF DIGITALISATION ON FINANCE BY COUNTRY COMPARISON

To explain digitalization on finance statistical operations are performed and as an output country comparison according to statistical operations following sub units are explained:

- Strategy: Collection of the data
- Data Analysis
- Descriptive Statistics
- Explore

4.1. STRATEGY: COLLECTION OF THE DATA

As technology usage increases in every sector, it is being harder to measure effects of technology especially on both business and technical systems. Banking systems are complex structures comprise of high level business processes and fundamental technical processes.

In this research, to understand effects of technology on banking sector, correlation analysis method is used. To understand years and customer habits, descriptive analysis method is used.

Yearly, especially periodically, reported data is used to show how countries' banking operations were affected. These data is collected from TBB (TürkiyeBankalarBirliği) for Turkey and for other countries it is collected from Bank for International Settlements (BIS) as banks' yearly financial reports.

Yearly, technology indexes of countries are collected from **http://stats.oecd.org**. To decide which indicator must be used was one of the most important parameter of this study. As an indicator "Main Science and Technology Indicators" is selected.

According to collected date, years are given between 2010 and 2015. Every year is divided into 4 terms (ex: Q1, Q2, Q3, Q4). There are countries and segmented bank data according to these terms. This study contains 11 countries' data for past 15 years. These are: AU:Australia, AT:Austria, BE:Belgium, BR:Brazil, CA:Canada, DK:Denmark, DE:Germany, SE:Sweden, TR:Turkey, GB:United Kingdom, US:United States. All sectors were chosen for every country, to understand technology and cash amount of countries' relation, the correlation analysis method. These countries' segmented bank data includes these subtitles' data:

- A:All sectors,
- I:Banks, related offices,
- B:Banks, total,
- N:Non-banks, total,
- U:Unallocated by sector.

In addition, base with all sectors cross-border operations and local operations are observed too.

Data gathered for this study will be visualized and processed with statistical techniques for future work.

4.2. DATA ANALYSIS

According to collected data, (explained in methodology part) for past 15 years, as total of terms and includes all sectors transactions Turkey includes the lowest numbers. However Germany includes the highest numbers. Descriptive statistical values shows the differences and comparison of the data, following figure include countries' all branches in terms of descriptive analysis procedure:

Output1:Descriptive Analysis by Countries in terms of Banking[83]

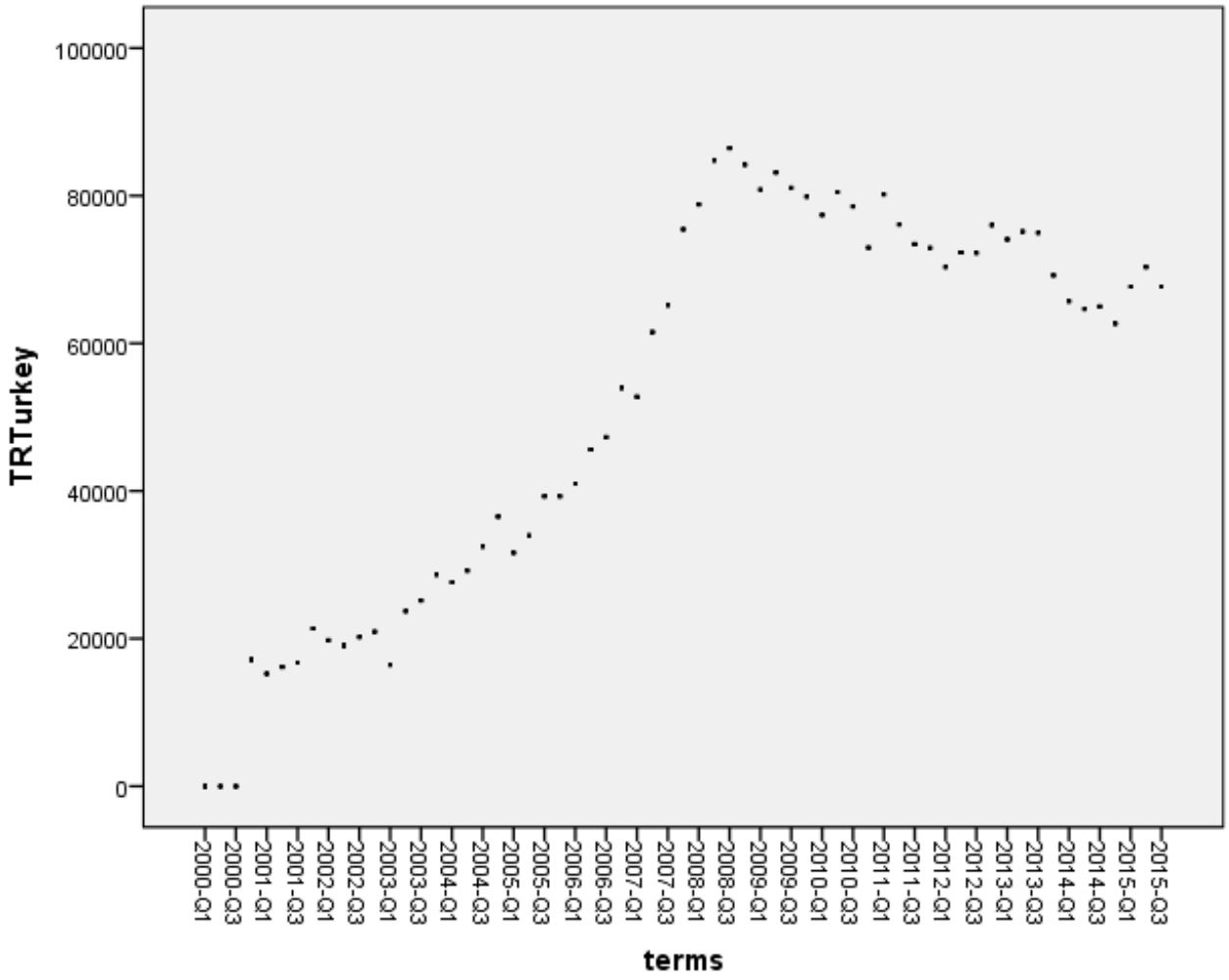
	N	Range	Minimum	Maximum	Mean
TRTurkey	63	86459	0	86459	52268,26
BRBrazil	63	306461	0	306461	124183,07
DKDenmark	63	239694	76247	315941	187481,05
ATAustria	63	351778	62670	414448	223576,43
AUAustralia	63	524319	36077	560396	268960,56
SESweden	63	960201	98663	1058864	534526,00
CACanada	63	790333	236114	1026447	606728,23
BEBelgium	63	1248918	353432	1602350	691675,05
USUnitedStates	63	3718532	1131223	4849755	3083814,86
GBUnitedKingdom	63	10415836	740287	11156123	4439866,55
DEGermany	63	7803758	2077564	9881322	5117861,68
Valid N (listwise)	63				

[83]Data source is taken from BIS, figure is output from SPSS

In addition to descriptive analysis procedure, Box Plot Stem Leaf procedure makes easier to understand the distribution of the data and visualize them. Moreover, that procedure shows the extreme and outlier values of the data with distribution line.

To understand differences between countries by years clearly on this research, Box Plot Stem Leaf Histogram is given bellow (as an example, according to following Figures the difference of development in banking sector between Turkey and Germany is given):

Output 2: Box Plot Stem Leaf Histogram- Turkey[84]



[84]Data source is taken from BIS, figure is output from SPSS

Output 3: Box Plot Stem Leaf Histogram- Germany[85]

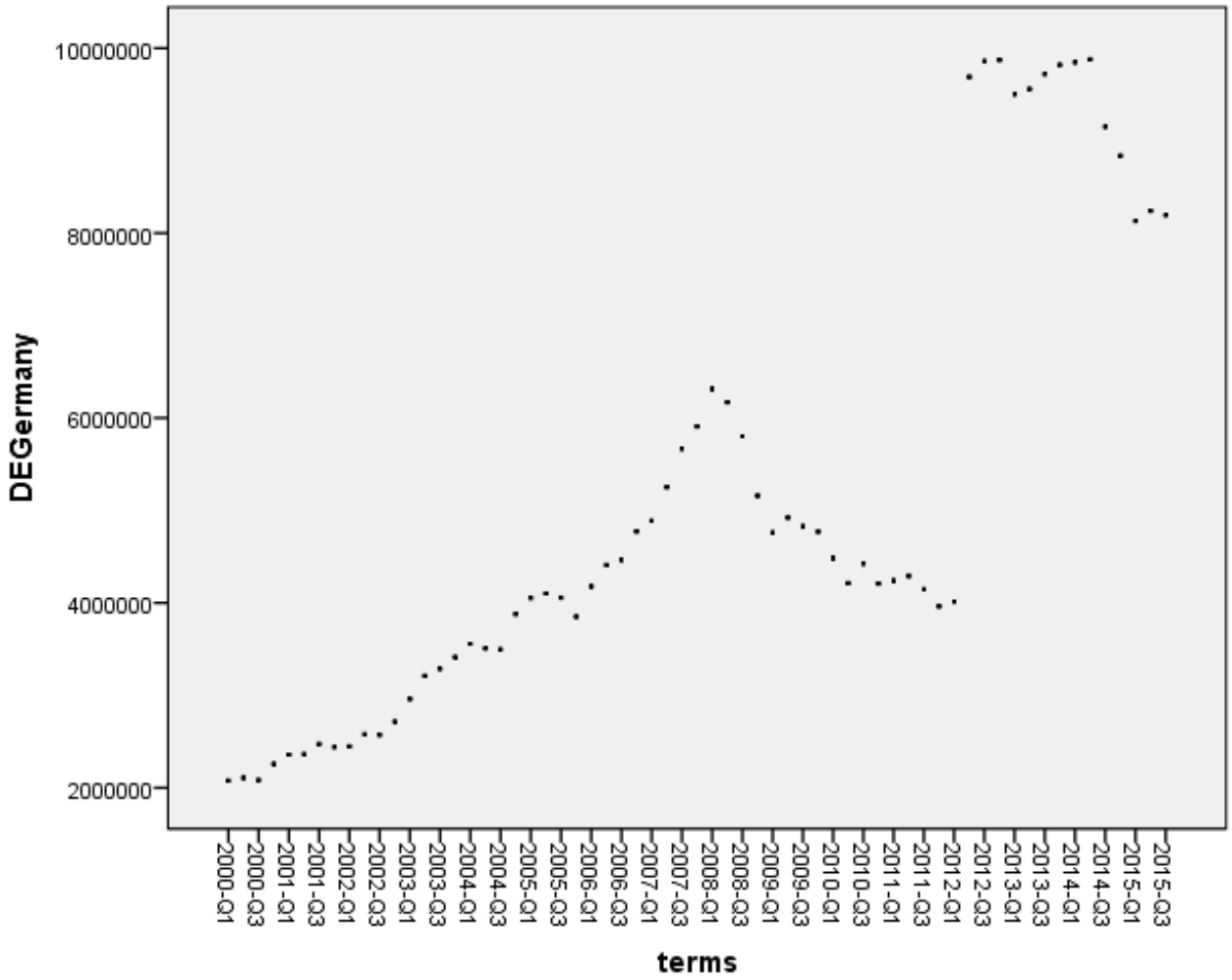


Figure 33 and Figure 34 unroll the digitalization impact on finance. 2008 is the critical year for the banks and countries because of financial crisis. Histograms exhibit the financial crisis with outlier values.

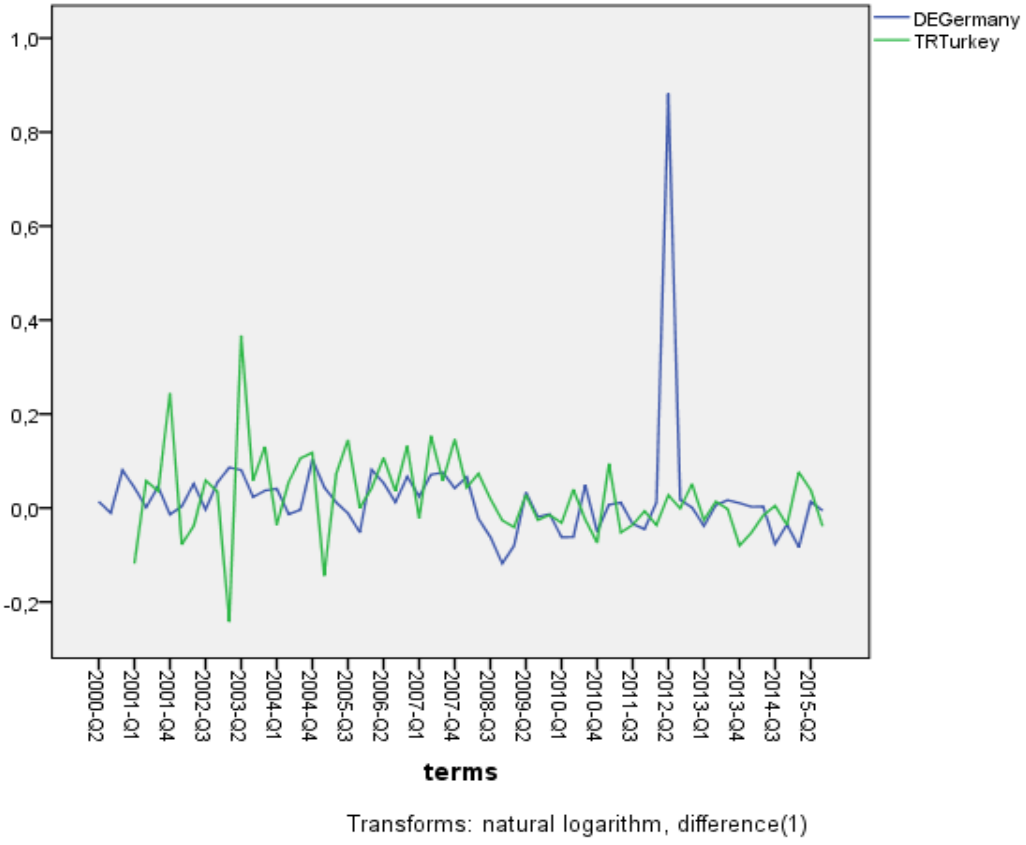
According to outlier values, it is easier to see that Germany was ready for digitalization after 2008 crisis. Financial experts explained that histogram as Germany prepared their investments according to digitalization and technological challenges so that their investments were much more than their incomes. That is why their money transactionswere so low.

[85]Data source is taken from BIS, figure is output from SPSS

After 2012 Q1 term, their incomes and profits exceeds their costs and depicted the reason which they were so high level country in the scale. Turkey was lower than Germany, because of the wrong strategy of the financial technologies and digital economy and governance planning which are explained in the Digital Economy part.

In addition to these Figures, factor analysis is done and difference between Germany and Turkey is shown by natural algorithm technique:

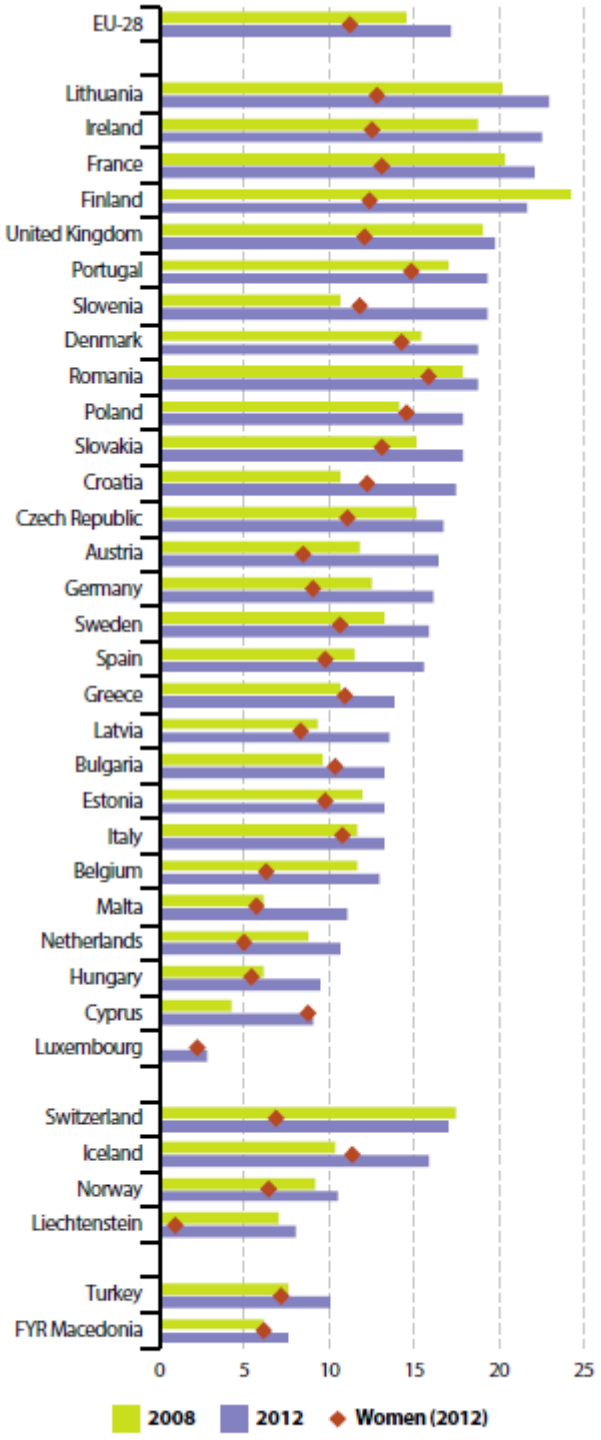
Output 4: Comparison between Germany and Turkey[86]



To understand technological effects on banking sector, technological development of countries should be analyzed. Following data interprets a Figure that explains why Germany represents higher performance on digital banking sector than Turkey and why Turkey has the lowest numbers. Technology development by countries data shows that Germany is higher level than Turkey:

[86] Data source is taken from BIS, figure is output from SPSS

Figure 34: Technology development by countries[87]



(*) 2011 data (instead of 2012) for FR; definition differs for IT (2008) and EU-28 (2012).

[87] Difference technology source: http://ec.europa.eu/eurostat/statistics-explained/index.php/Europe_2020_indicators_-_research_and_development

4.2.1 DESCRIPTIVE STATISTICS

According to SPSS, the Descriptive Statistic, option produces a set list of descriptive statistics: mean, confidence interval for the mean (default 95% CI), 5% trimmed mean, median, variance, standard deviation, minimum, maximum, range, interquartile range (IQR), skewness, kurtosis, and standard errors for the mean, skewness and kurtosis.

To analyze and make meaningful outputs from the complex data, descriptive statistical method is applied. Results are explained at the end of the “output” figures.

The data- cash amount from the countries- is summarized briefly and difference between countries are shown.

The Frequencies procedure can produce summary measures for categorical variables in the form of frequency tables, bar charts, or pie charts. Each country has their own frequency graph at this study.

Output 5: Descriptive Statistics of Countries

	N	Minimum	Maximum	Mean	Std. Deviation
USUnitedStates	63	1879012,000	5730662,000	4183582,97800	1238079,194069
GBUnitedKingdom	63	1384717,000	6214934,000	3766387,05559	1382383,068947
DEGermany	63	761381,000	2018548,000	1426760,23483	351228,677790
FRFrance	63	477778,000	2158736,000	1370683,72598	504480,915199
ITItaly	63	453780,000	1445378,000	831645,27856	259373,850959
IEIreland	63	161136,000	1374122,000	657601,76405	345653,726141
ESSpain	63	162285,000	1267369,000	636133,28397	321018,820409
CHSwitzerland	63	342216,000	1051297,000	599812,15775	153482,668636
BEBelgium	63	200729,000	748163,000	415064,65576	128695,563229
SESweden	63	104922,000	383036,058	254786,16517	90361,748220
ATAustria	63	91062,000	343320,000	204496,32002	65233,825601
PTPortugal	63	67516,000	334470,000	184127,06662	71865,393448
FIFinland	63	35520,000	264336,110	137113,75241	73865,399802
GRGreece	63	45503,228	250812,000	127013,73592	59303,091401
TRTurkey	63	35401,000	193109,897	112614,03232	57896,283397
RURussia	63	31891,000	209686,000	111549,01563	57045,822218
MXMexico	63	54810,000	129408,133	91141,84410	26113,765347
SASaudiArabia	63	19144,000	91383,578	55520,84386	28199,754456
CYCyprus	63	7368,000	109314,000	40029,17867	29835,716002

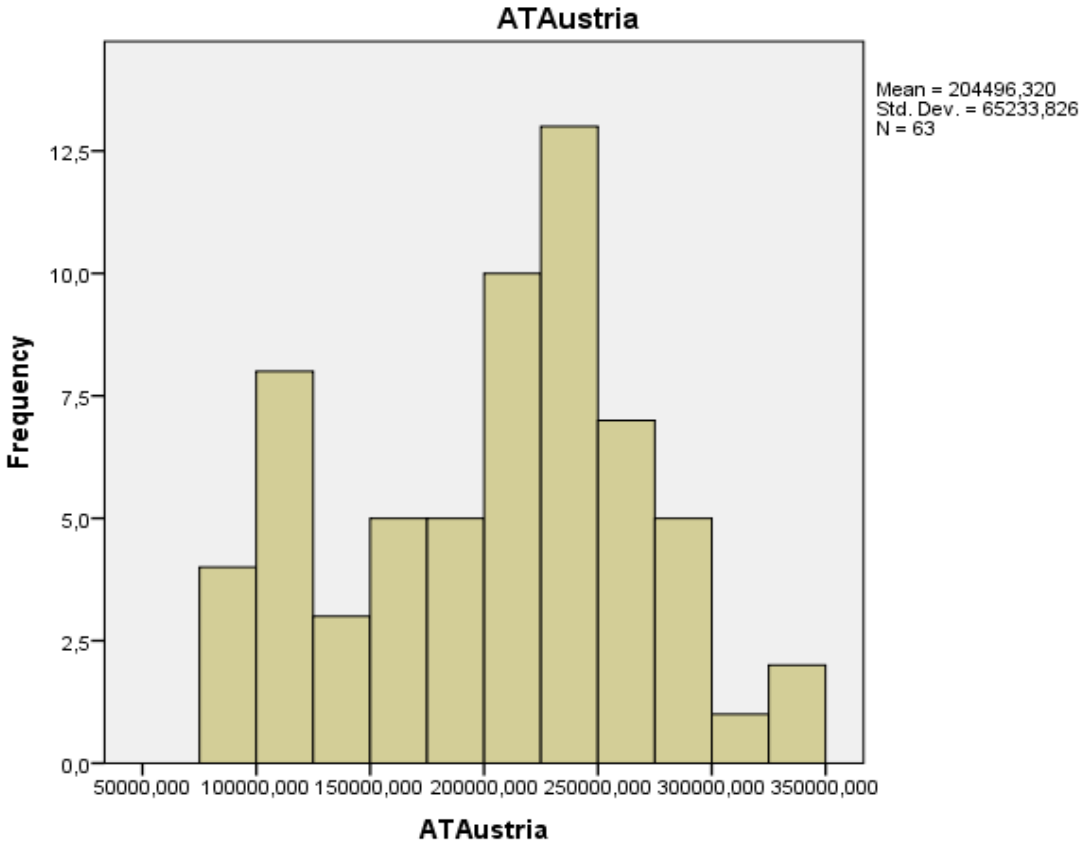
COColombia	63	8296,000	29348,028	14776,76456	6392,136281
IRIran	63	3585,437	27616,000	14518,85463	7980,523003
UAUkraine	63	635,000	38120,000	13186,93965	11270,582742
EGEgypt	63	6531,000	22564,000	12820,70252	4770,495538
EEEstonia	63	974,000	21142,000	9185,44363	6075,842444
KPNorthKorea	63	44,943	494,000	195,81811	138,819621
Valid N (listwise)	63				

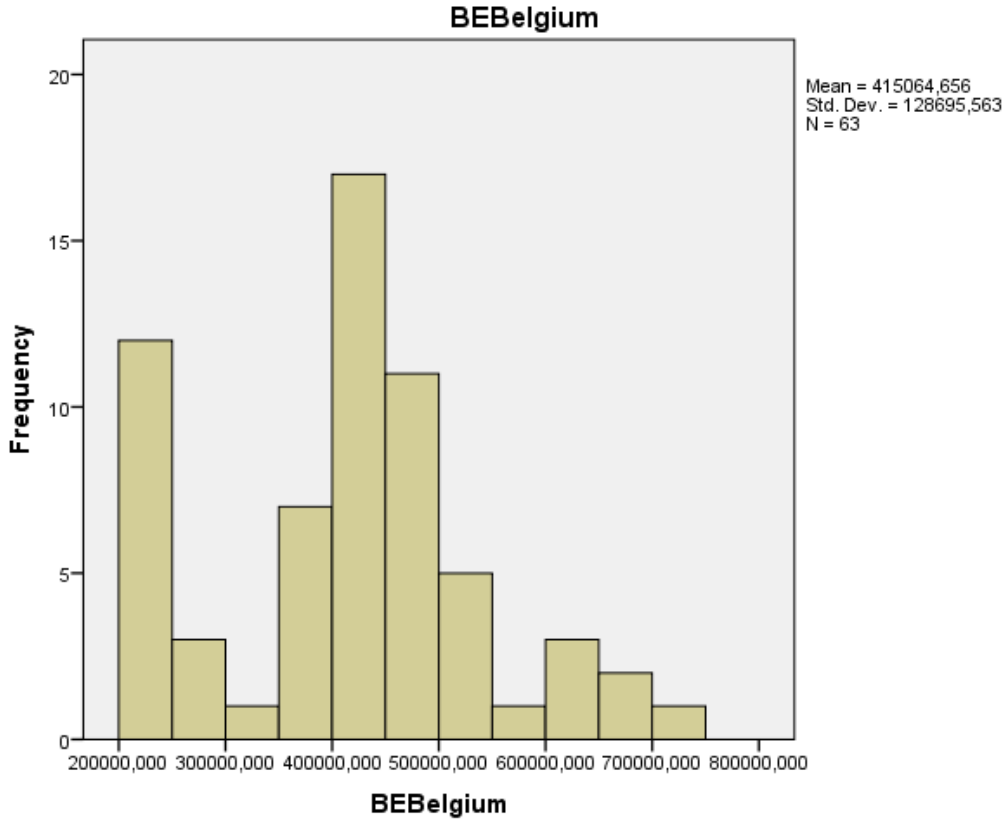
There are 25 countries. There is no invalid value.

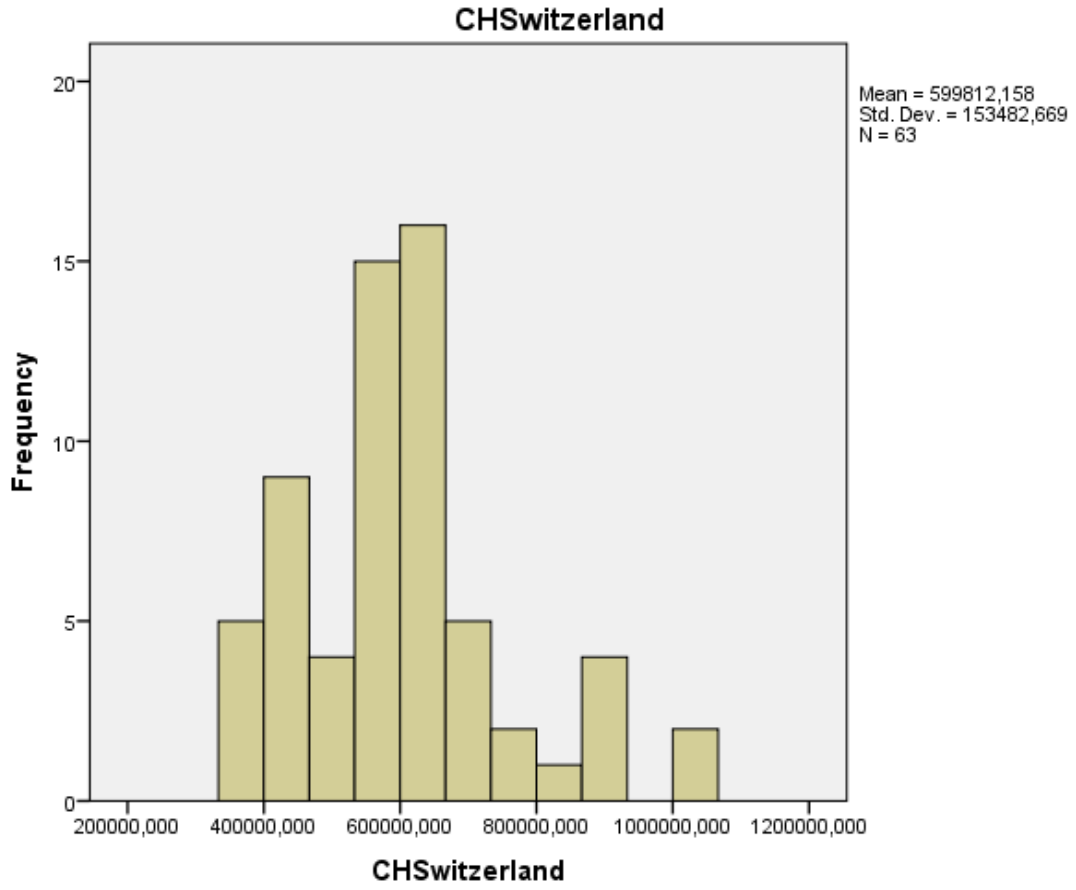
According to data, maximum mean of cash in overall sector is in United States, minimum is in North Korea.

Outlier and extreme values can be observed on frequency Figures which are given below:

Output 6: Frequency Outputs of Countries






CHSwitzerland
Mean = 599812,158
Std. Dev. = 153482,669
N = 63
Frequency
0
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10
15
20
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400000,000
600000,000
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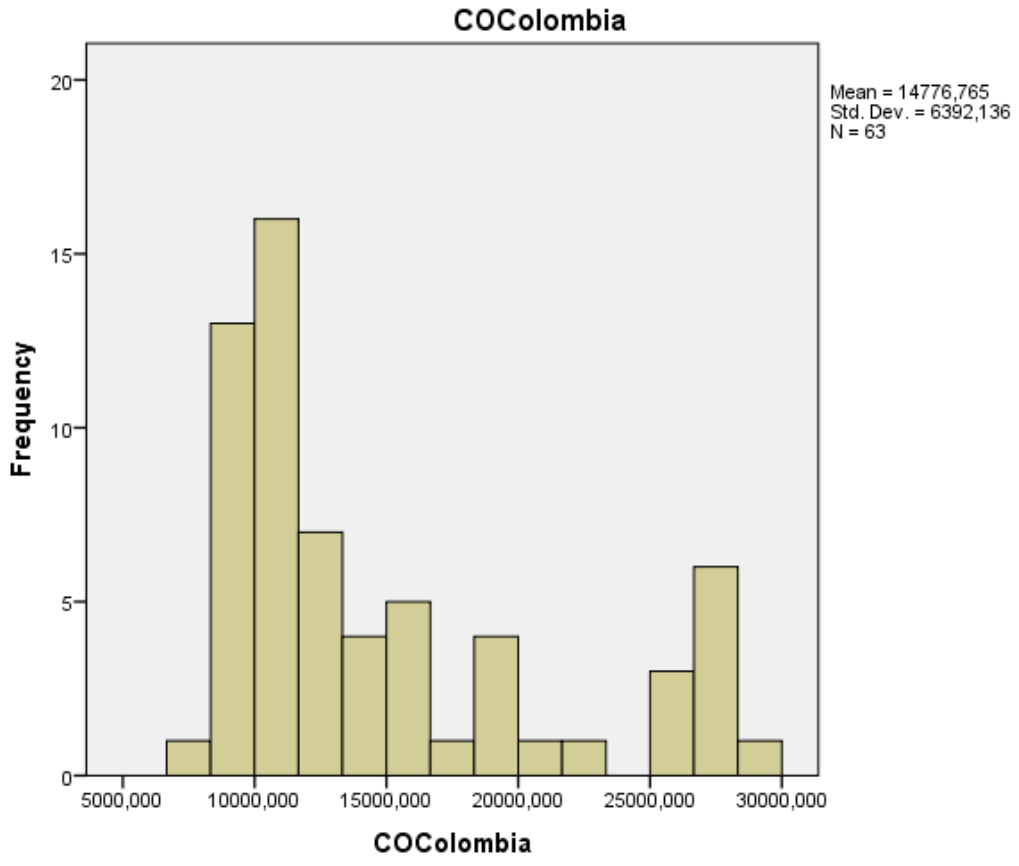
CHSwitzerland


COColombia
Mean = 14776,765
Std. Dev. = 6392,136
N = 63
Frequency
0
5
10
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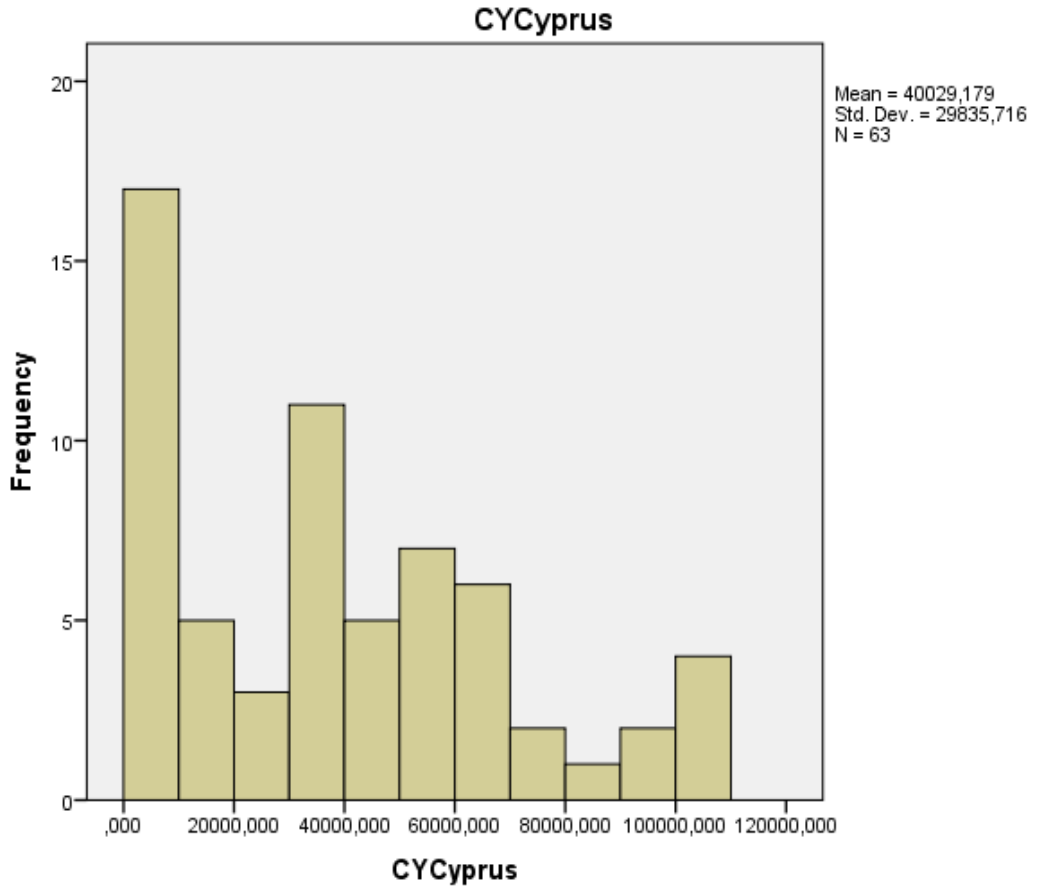
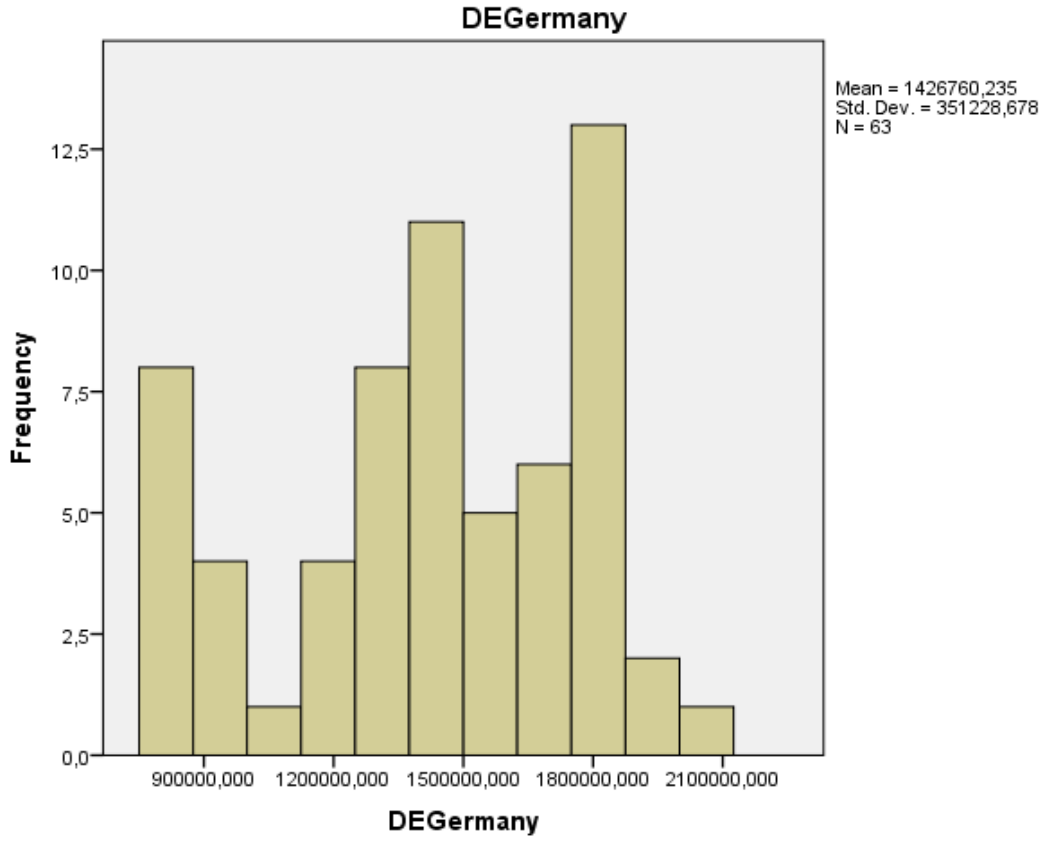
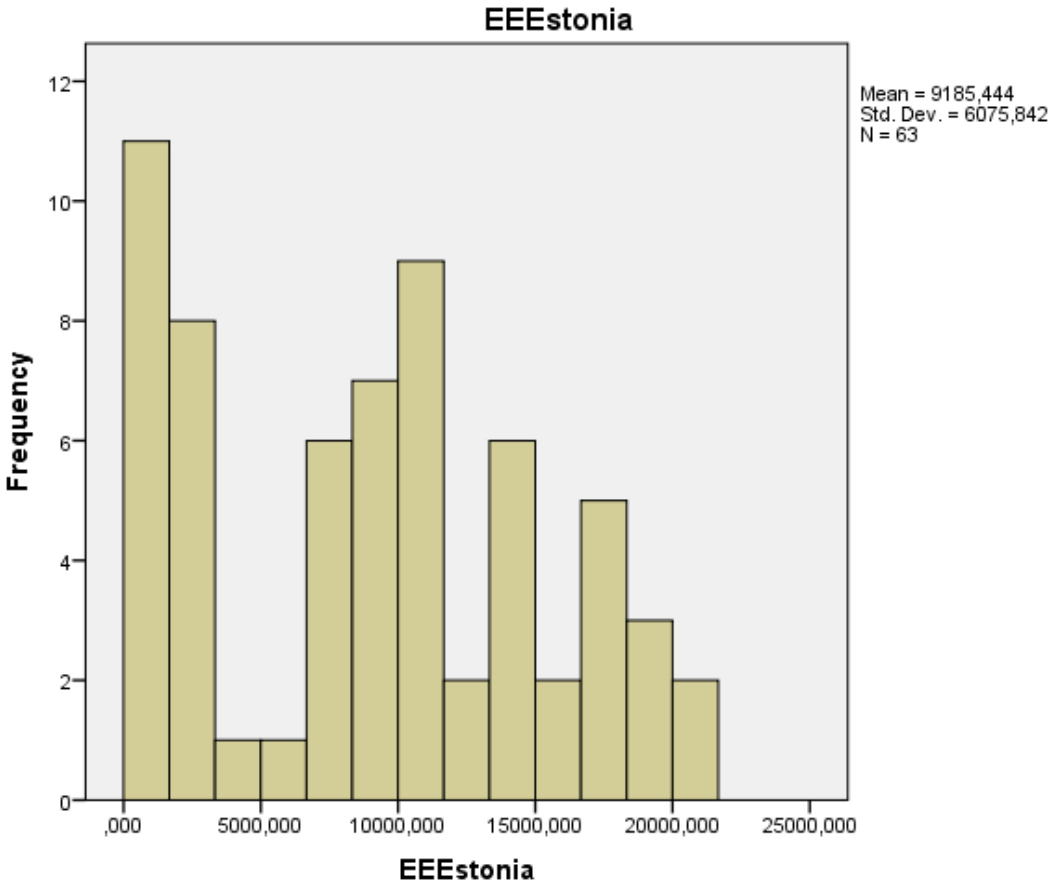
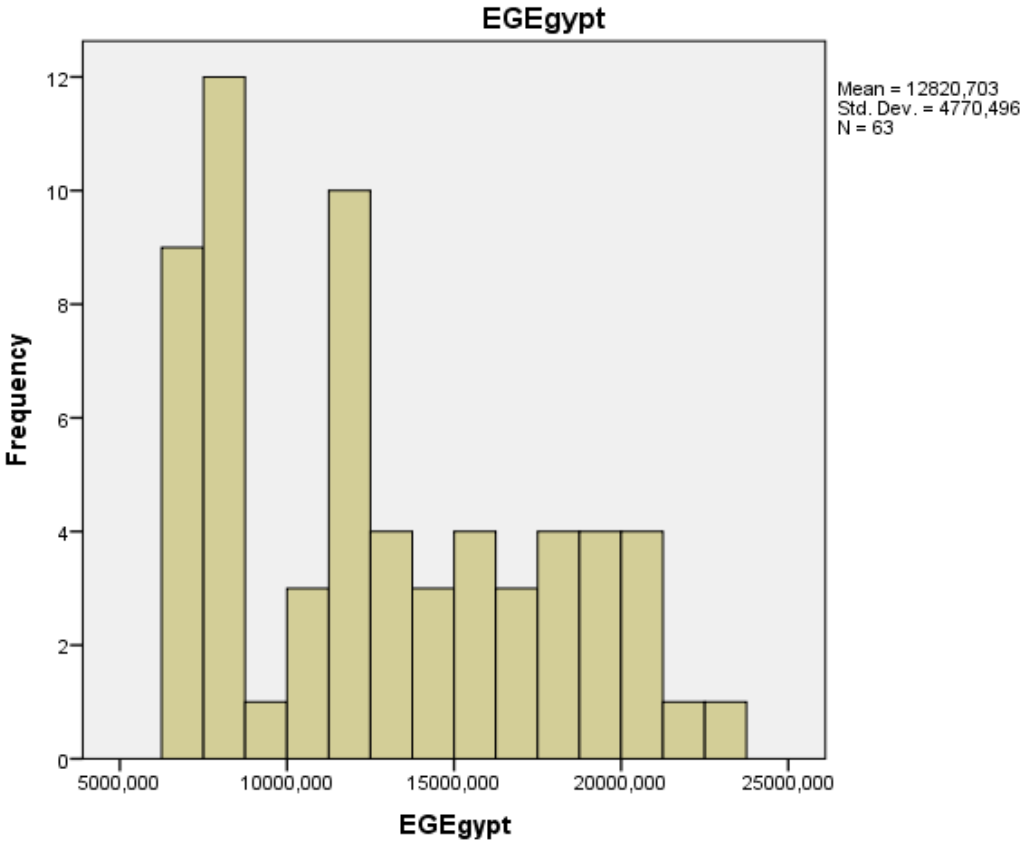
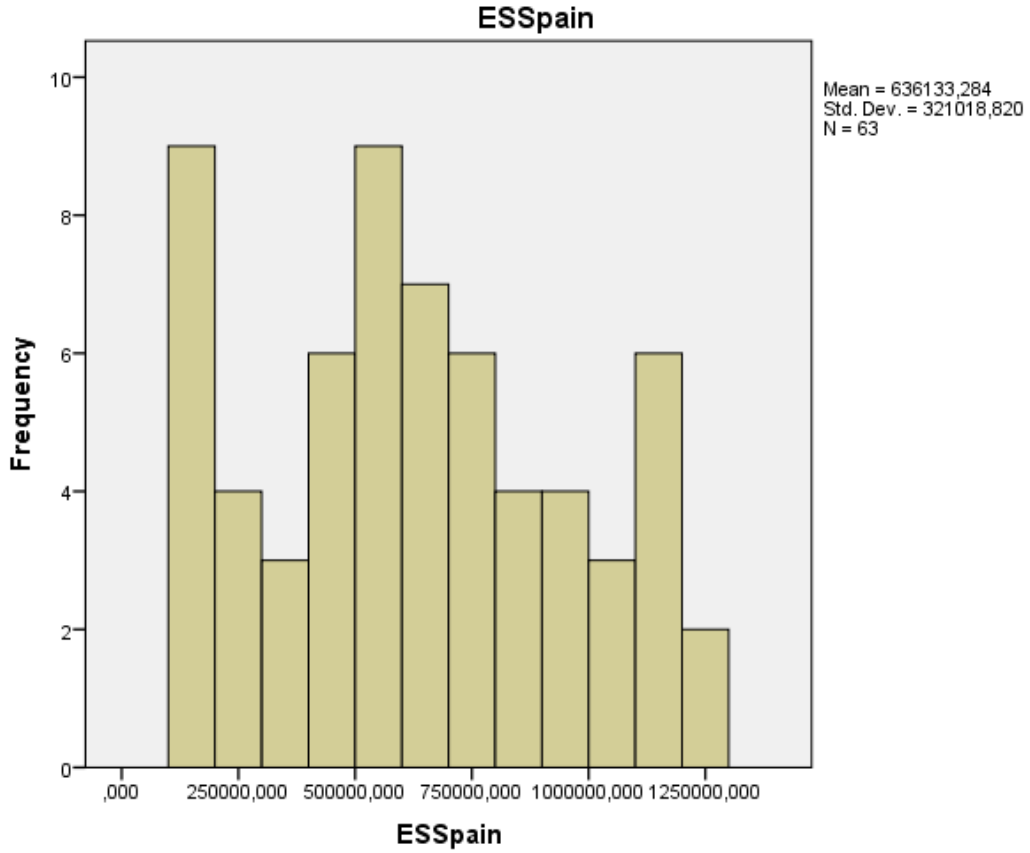
20
5000,000
10000,000
15000,000
20000,000
25000,000
30000,000
COColombia

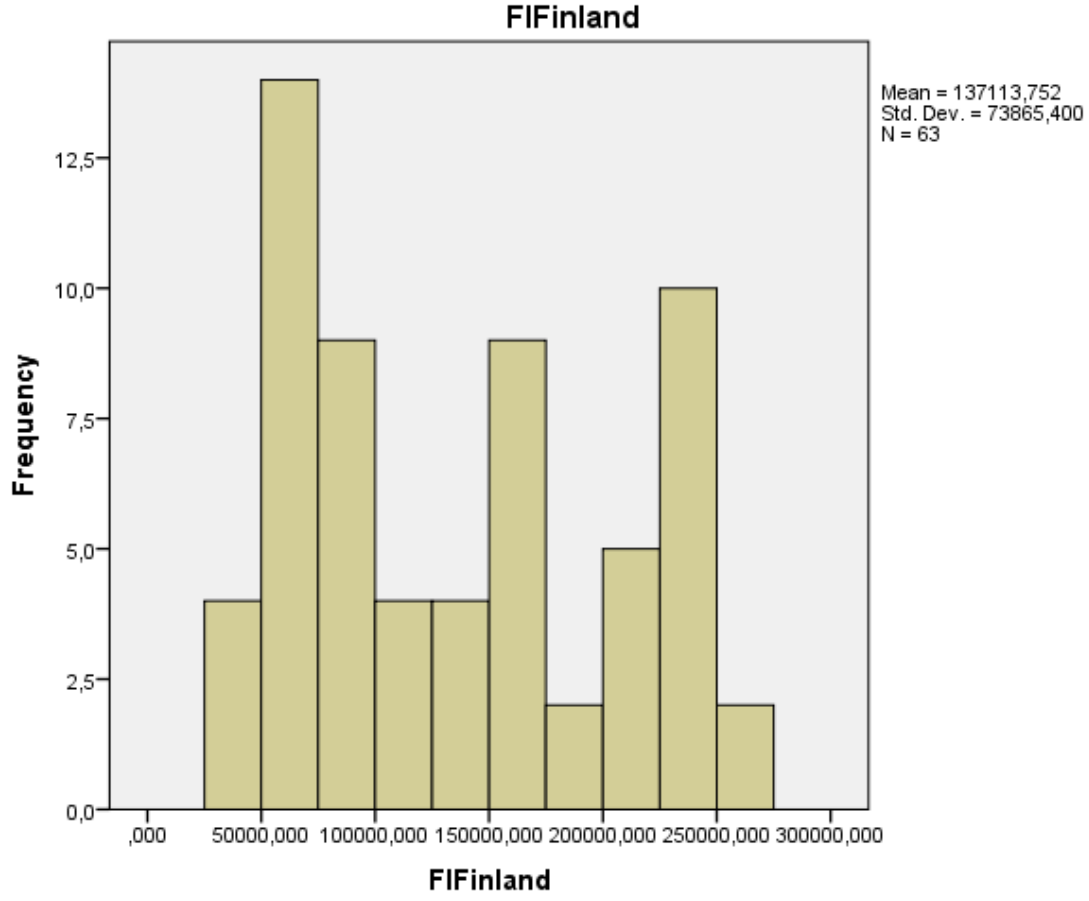

CYCyprus
Mean = 40029,179
Std. Dev. = 29835,716
N = 63
Frequency
20
15
10
5
0
,000
20000,000
40000,000
60000,000
80000,000
100000,000
120000,000
CYCyprus

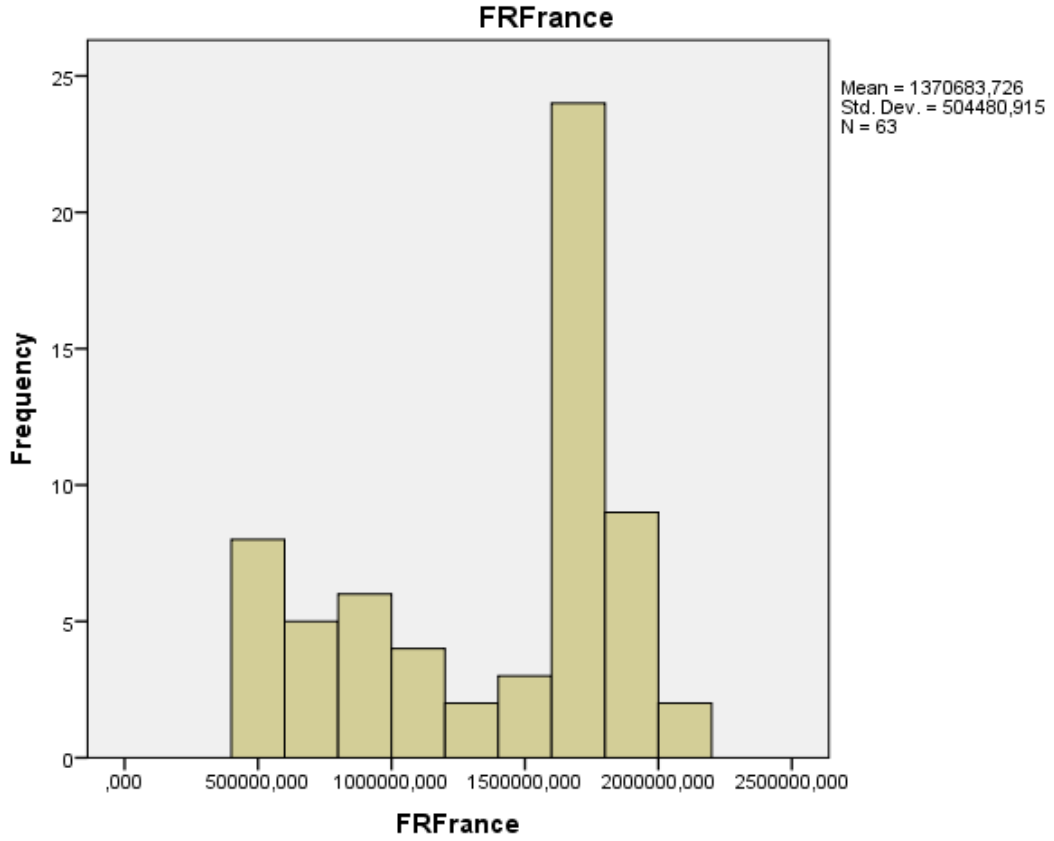

DEGermany
Mean = 1426760,235
Std. Dev. = 351228,678
N = 63
Frequency
12,5
10,0
7,5
5,0
2,5
0,0
900000,000
1200000,000
1500000,000
1800000,000
2100000,000
DEGermany

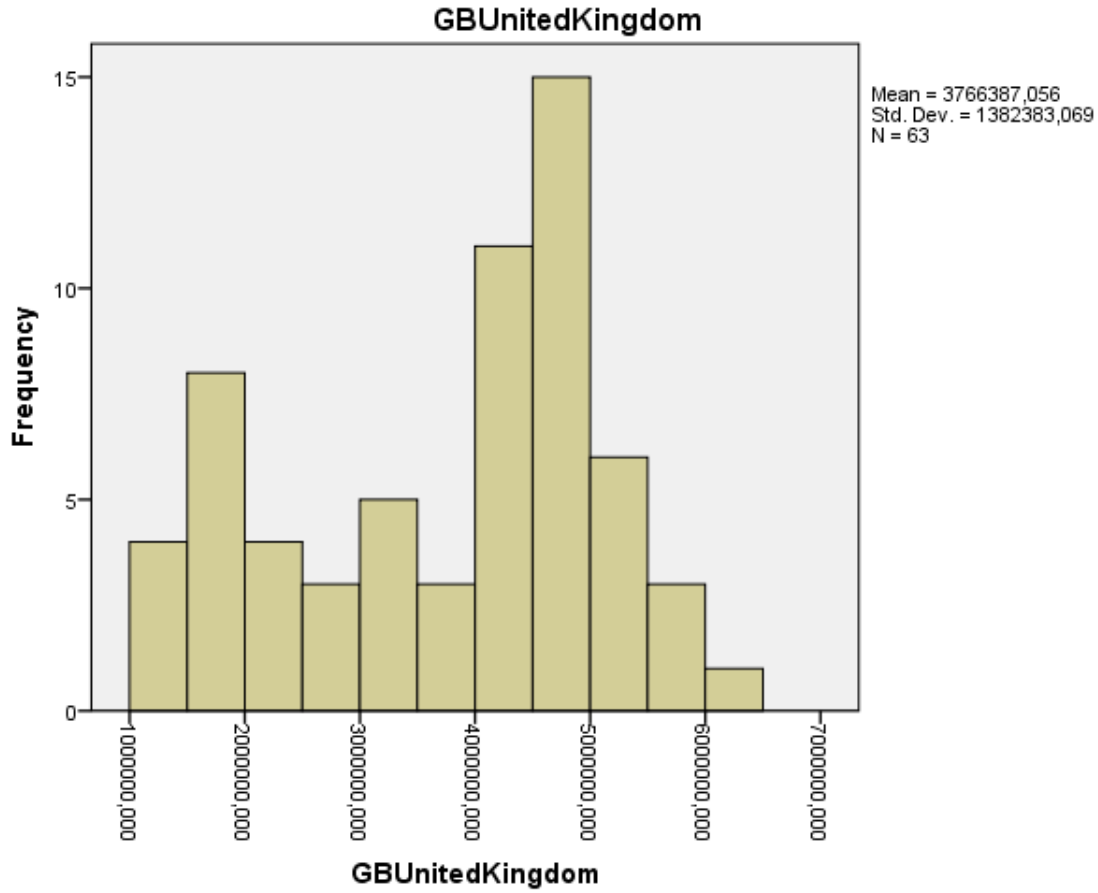

EEEstonia
Mean = 9185,444
Std. Dev. = 6075,842
N = 63
Frequency
0
2
4
6
8
10
12
,000
5000,000
10000,000
15000,000
20000,000
25000,000
EEEstonia

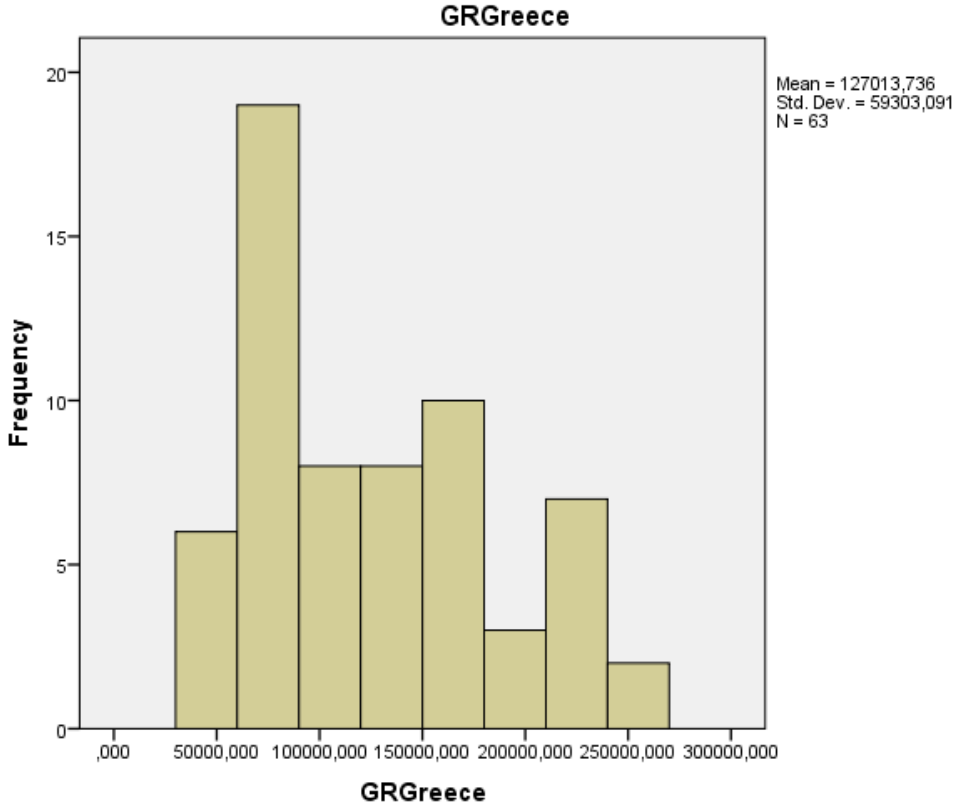

EGEgypt
Mean = 12820,703
Std. Dev. = 4770,496
N = 63
Frequency
0
2
4
6
8
10
12
5000,000
10000,000
15000,000
20000,000
25000,000
EGEgypt

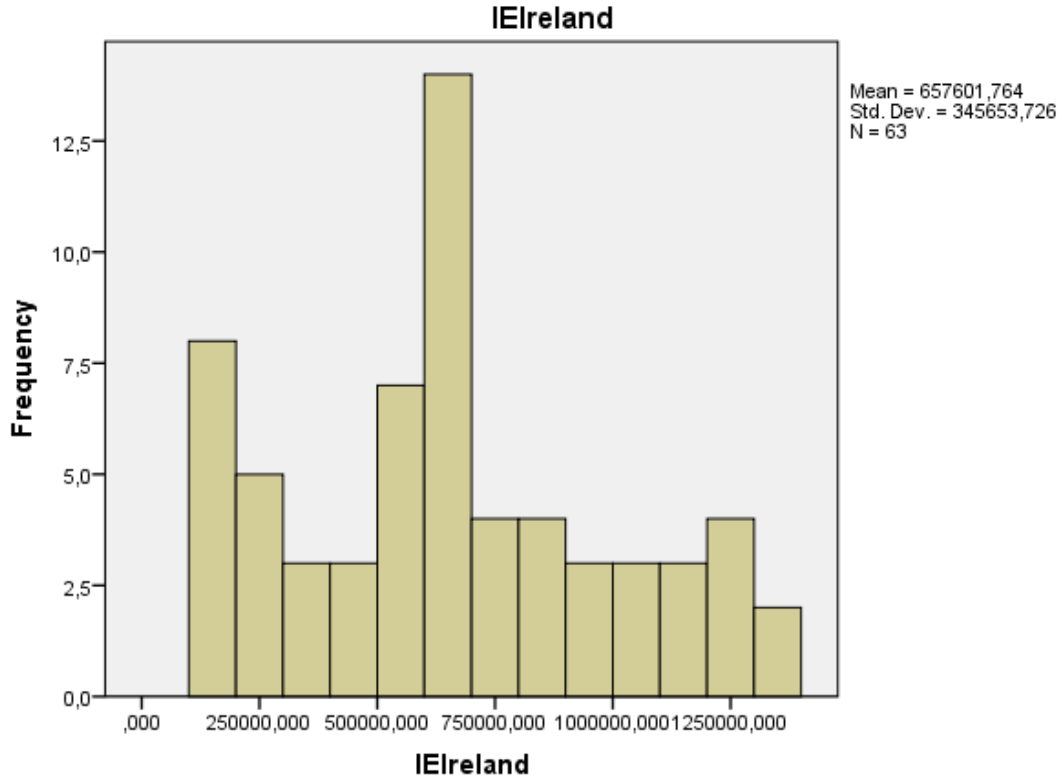

ESSpain
Mean = 636133,284
Std. Dev. = 321018,820
N = 63
Frequency
10
8
6
4
2
0
,000
250000,000
500000,000
750000,000
1000000,000
1250000,000
ESSpain

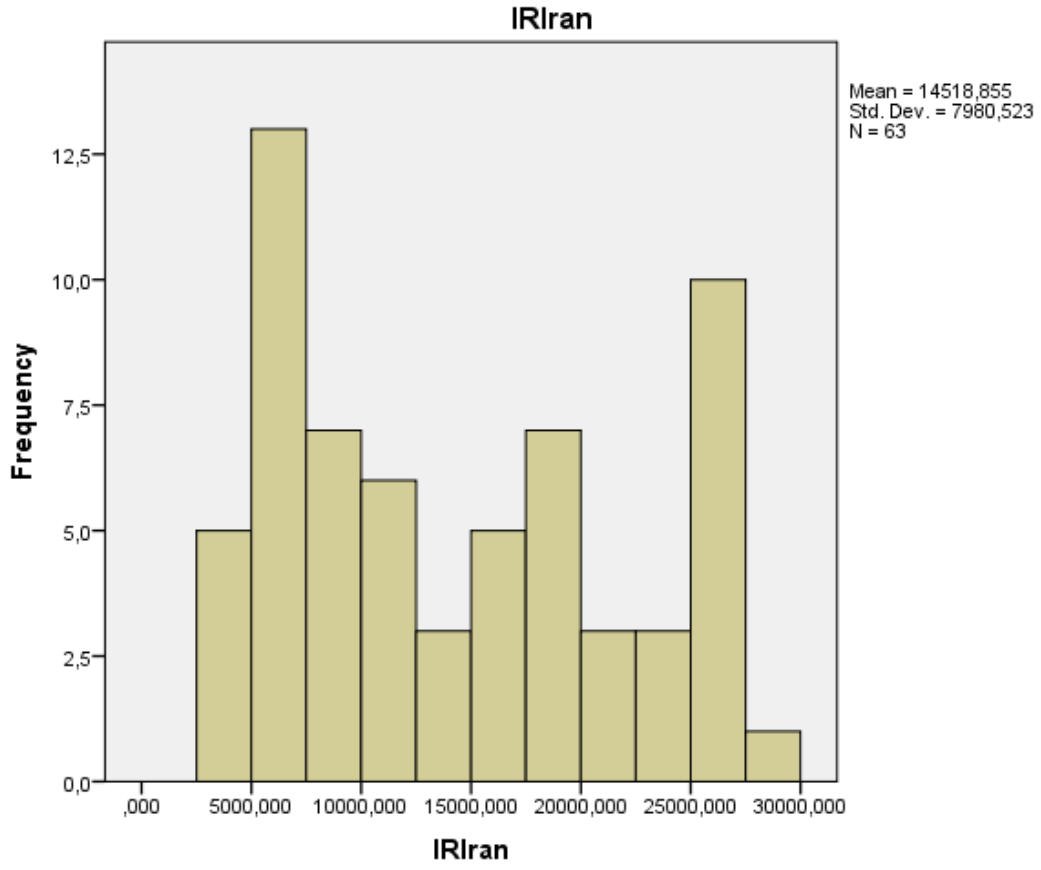

FIFinland
Mean = 137113,752
Std. Dev. = 73865,400
N = 63
Frequency
12,5
10,0
7,5
5,0
2,5
0,0
,000
50000,000
100000,000
150000,000
200000,000
250000,000
300000,000
FIFinland

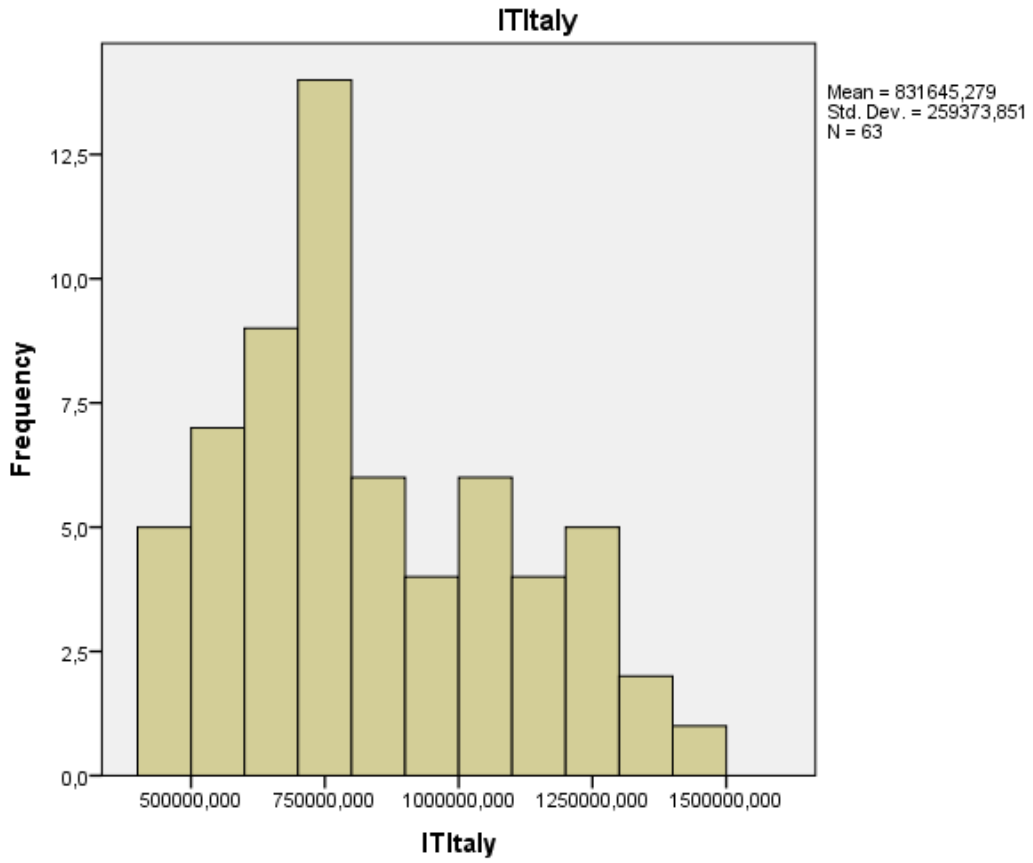

FRFrance
Mean = 1370683,726
Std. Dev. = 504480,915
N = 63
Frequency
25
20
15
10
5
0
,000
500000,000
1000000,000
1500000,000
2000000,000
2500000,000
FRFrance

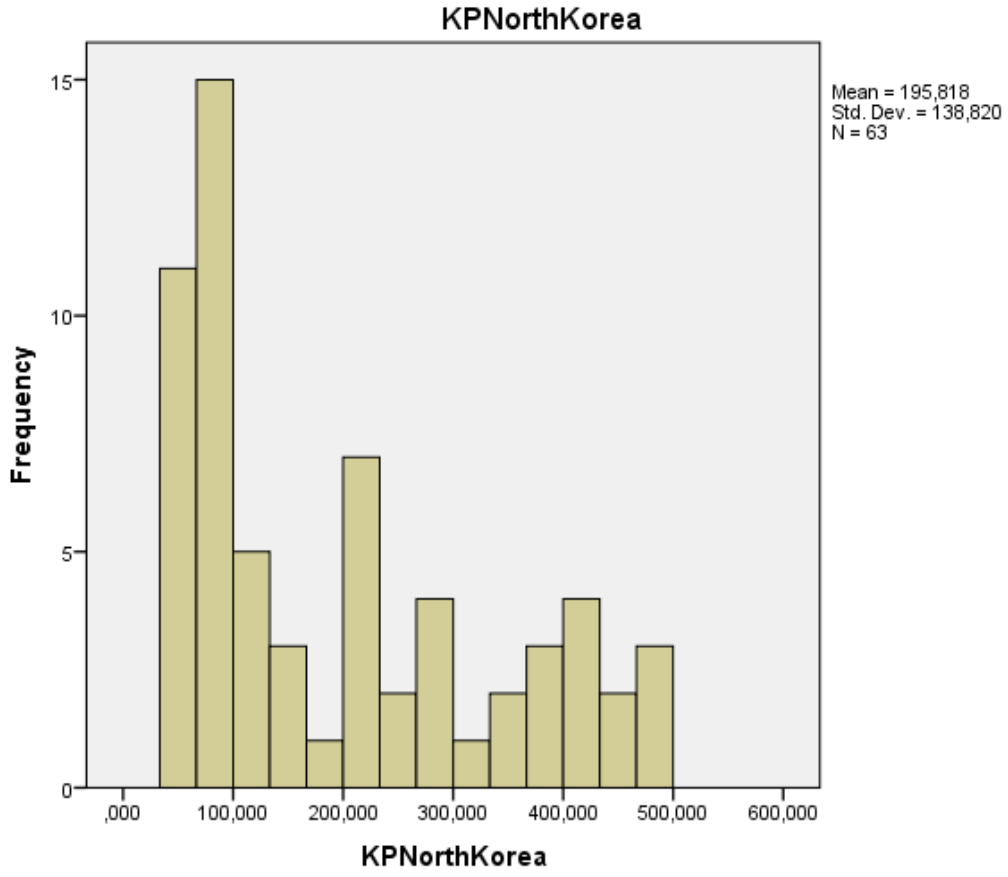

GBUnitedKingdom
Mean = 3766387,056
Std. Dev. = 1382383,069
N = 63
Frequency
15
10
5
0
1000000,000
2000000,000
3000000,000
4000000,000
5000000,000
6000000,000
7000000,000
GBUnitedKingdom

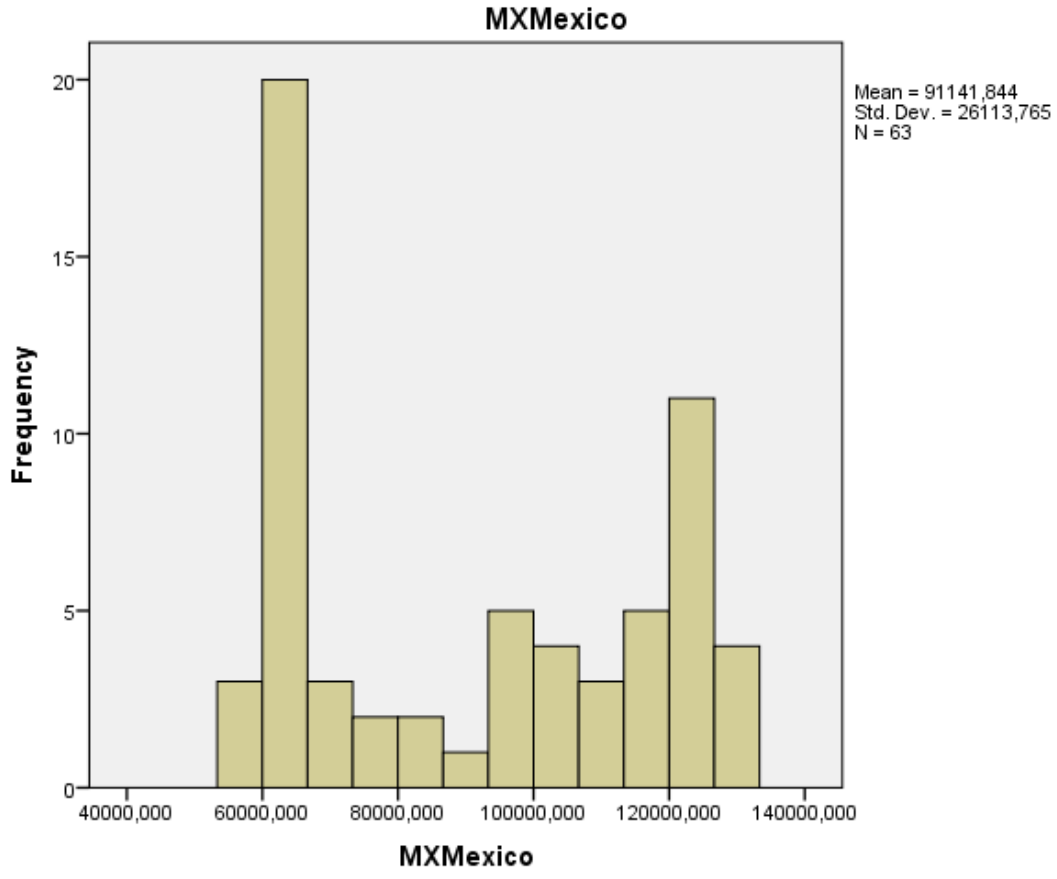

GRGreece
Mean = 127013,736
Std. Dev. = 59303,091
N = 63
Frequency
20
15
10
5
0
,000
50000,000
100000,000
150000,000
200000,000
250000,000
300000,000
GRGreece

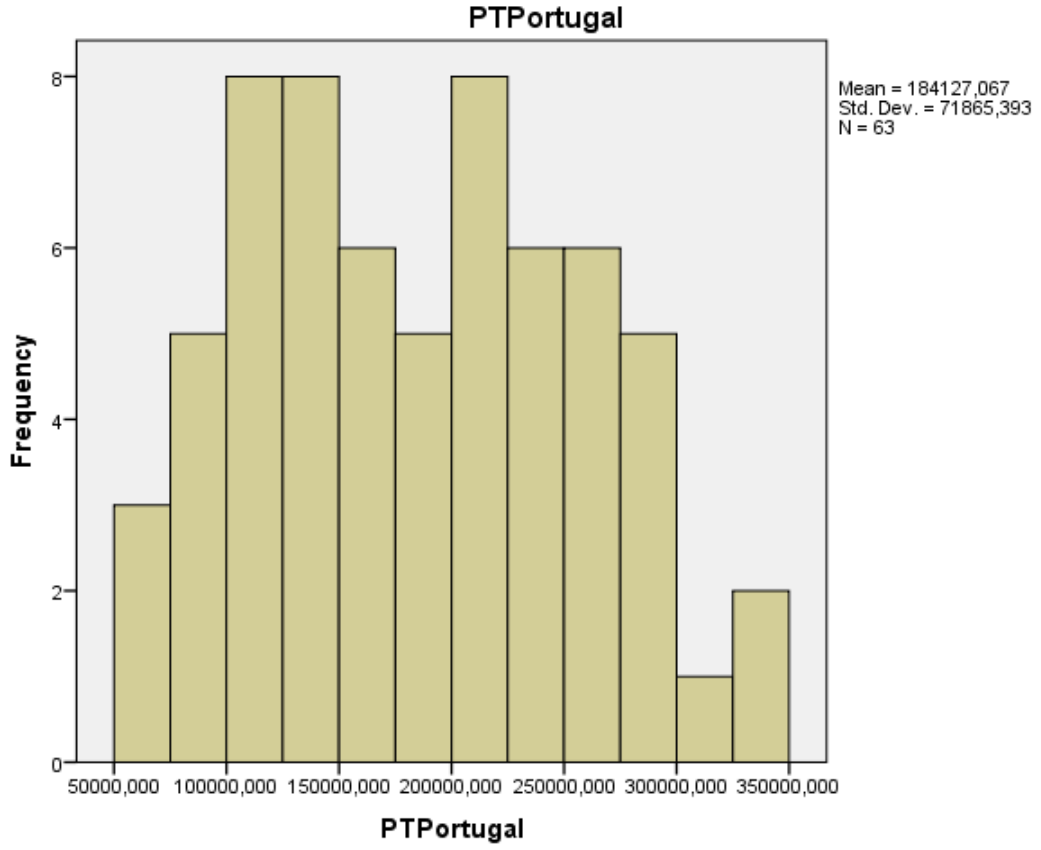

lElreland
Mean = 657601,764
Std. Dev. = 345653,726
N = 63
Frequency
12,5
10,0
7,5
5,0
2,5
0,0
,000
250000,000
500000,000
750000,000
1000000,000
1250000,000
lElreland

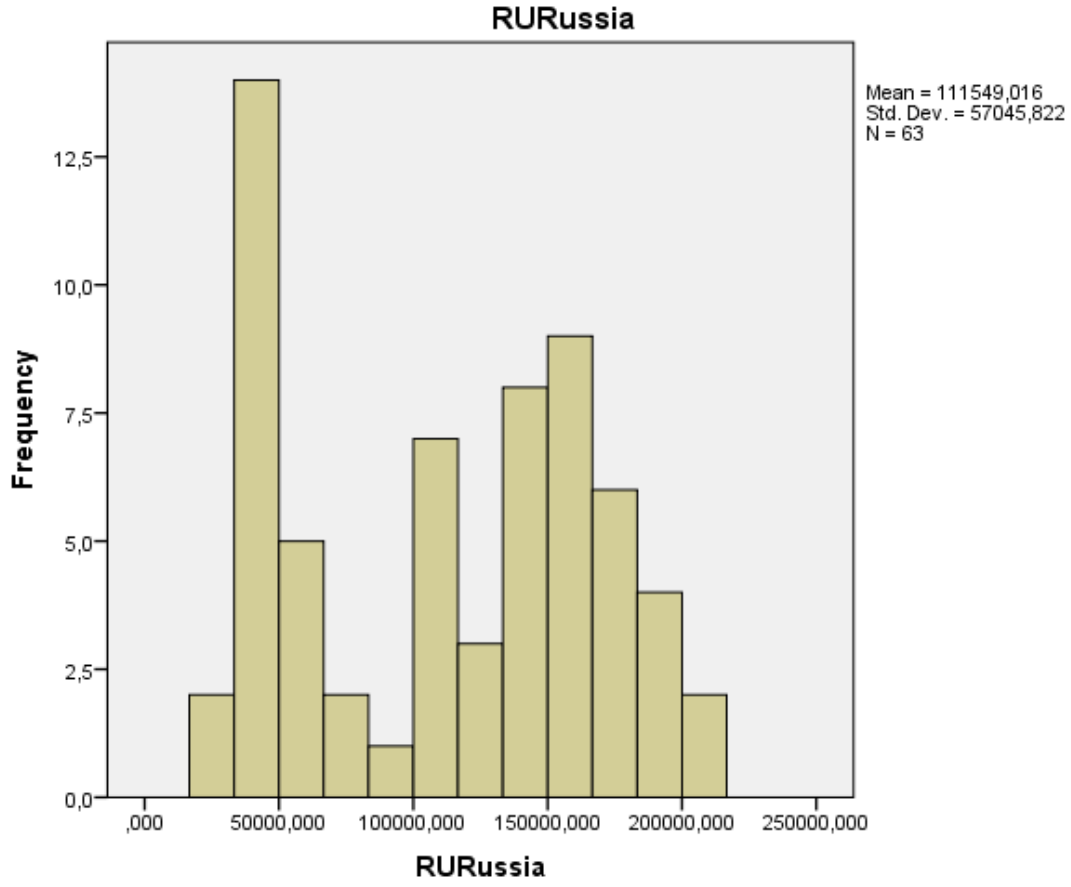

IRIran
Mean = 14518,855
Std. Dev. = 7980,523
N = 63
Frequency
12,5
10,0
7,5
5,0
2,5
0,0
,000
5000,000
10000,000
15000,000
20000,000
25000,000
30000,000
IRIran

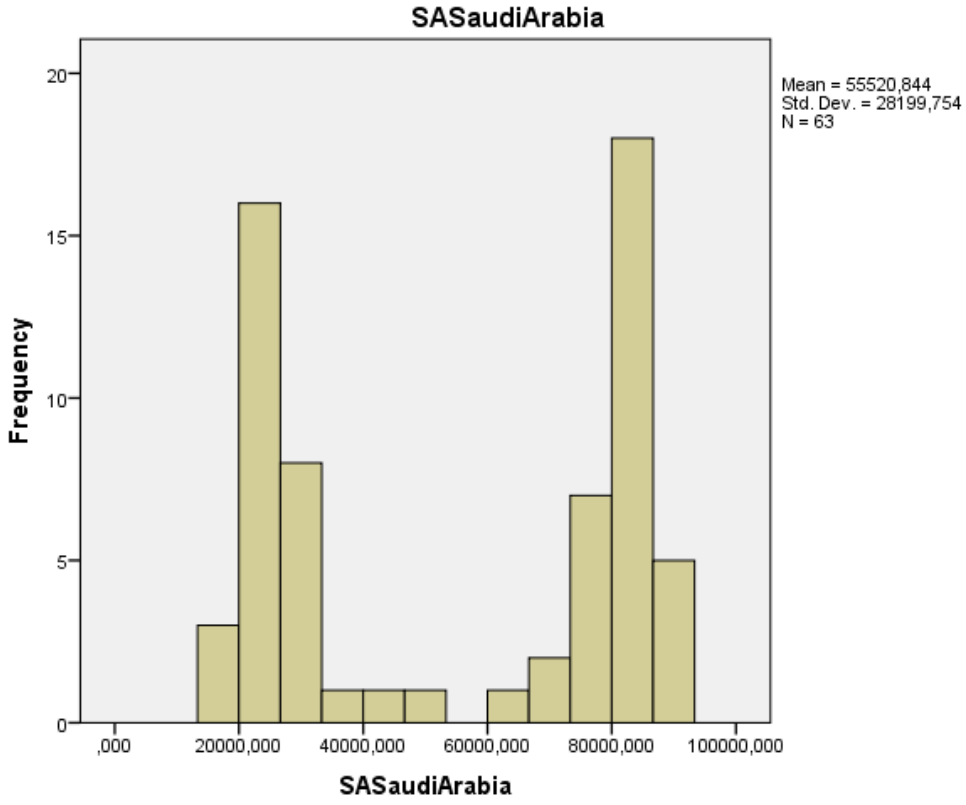

ITItaly
Mean = 831645,279
Std. Dev. = 259373,851
N = 63
Frequency
12,5
10,0
7,5
5,0
2,5
0,0
500000,000
750000,000
1000000,000
1250000,000
1500000,000
ITItaly

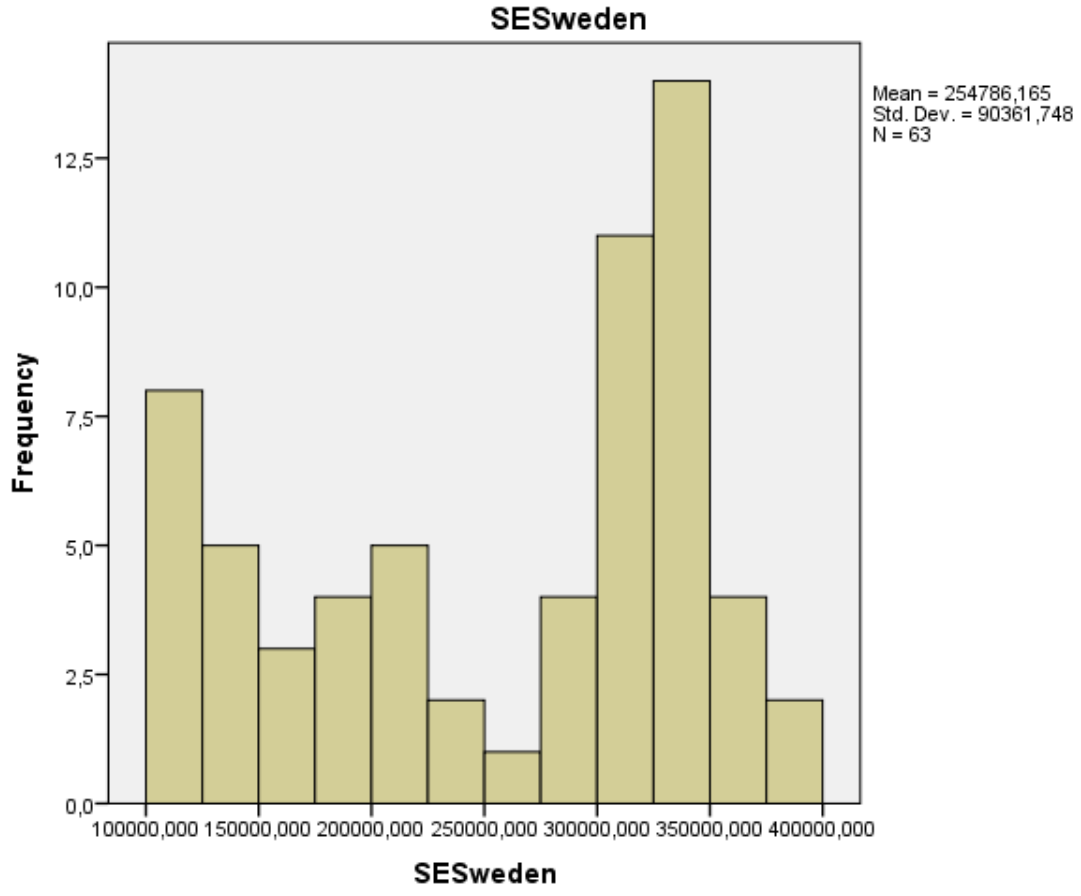

KPNorthKorea
Mean = 195,818
Std. Dev. = 138,820
N = 63
Frequency
15
10
5
0
,000
100,000
200,000
300,000
400,000
500,000
600,000
KPNorthKorea

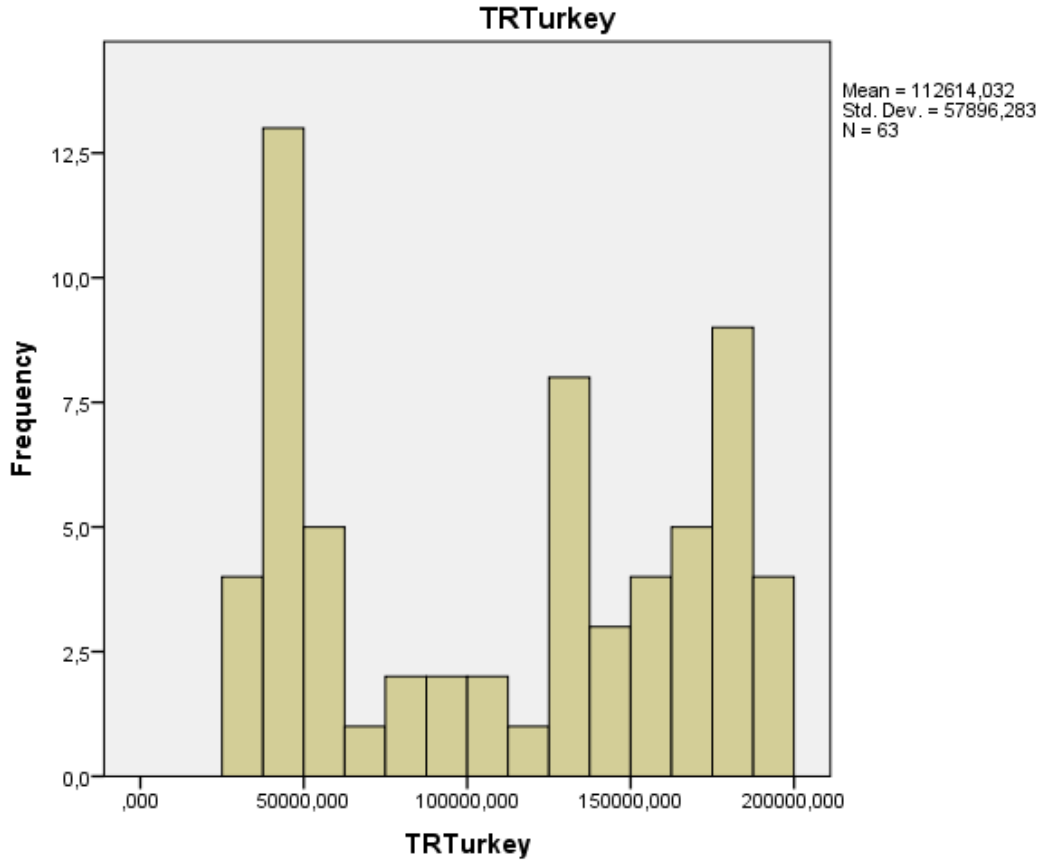

MXMexico
Mean = 91141,844
Std. Dev. = 26113,765
N = 63
Frequency
20
15
10
5
0
40000,000
60000,000
80000,000
100000,000
120000,000
140000,000
MXMexico

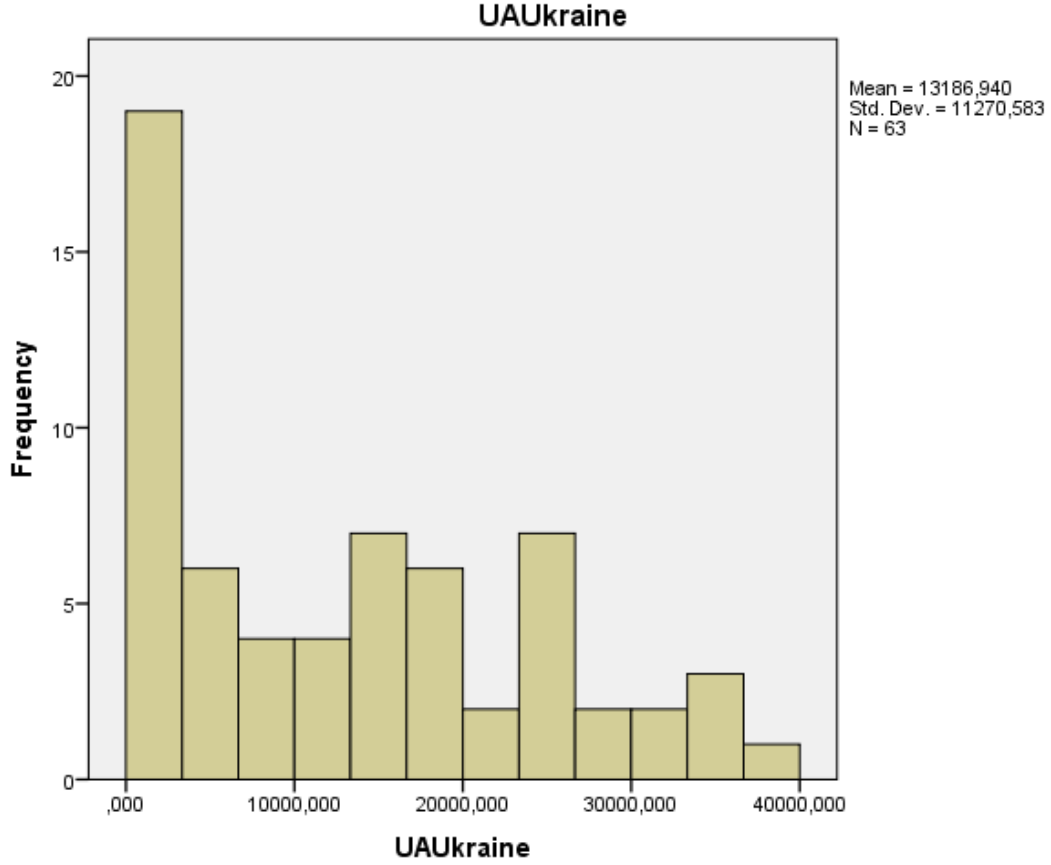

PTPortugal
Mean = 184127,067
Std. Dev. = 71865,393
N = 63
Frequency
0
2
4
6
8
50000,000
100000,000
150000,000
200000,000
250000,000
300000,000
350000,000
PTPortugal

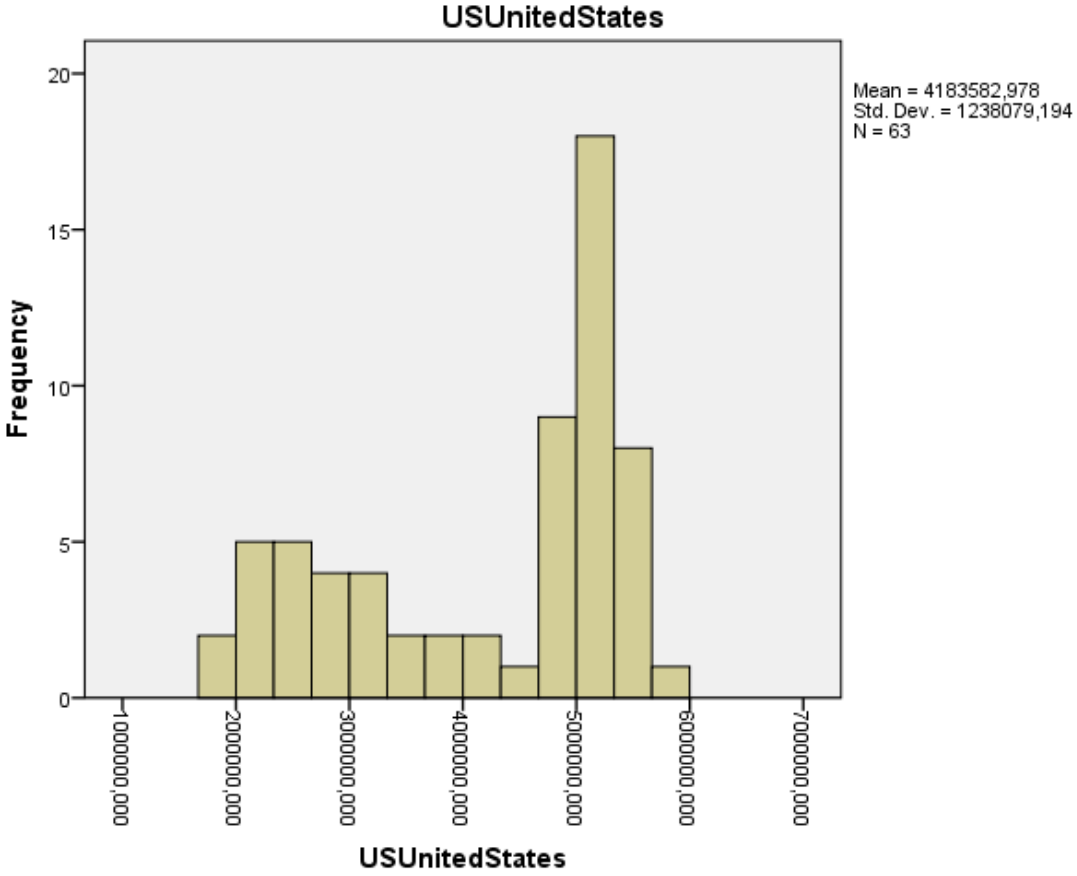

RURussia
Mean = 111549,016
Std. Dev. = 57045,822
N = 63
Frequency
0,0
2,5
5,0
7,5
10,0
12,5
,000
50000,000
100000,000
150000,000
200000,000
250000,000
RURussia


SASaudiArabia
Mean = 55520,844
Std. Dev. = 28199,754
N = 63
Frequency
20
15
10
5
0
,000
20000,000
40000,000
60000,000
80000,000
100000,000
SASaudiArabia


SESweden
Mean = 254786,165
Std. Dev. = 90361,748
N = 63
Frequency
12,5
10,0
7,5
5,0
2,5
0,0
100000,000
150000,000
200000,000
250000,000
300000,000
350000,000
400000,000
SESweden


TRTurkey
Mean = 112614,032
Std. Dev. = 57896,283
N = 63
Frequency
12,5
10,0
7,5
5,0
2,5
0,0
,000
50000,000
100000,000
150000,000
200000,000
TRTurkey


UAUkraine
Mean = 13186,940
Std. Dev. = 11270,583
N = 63
Frequency
20
15
10
5
0
,000
10000,000
20000,000
30000,000
40000,000
UAUkraine


USUnitedStates
Mean = 4183582,978
Std. Dev. = 1238079,194
N = 63
Frequency
20
15
10
5
0
1000000,000
2000000,000
3000000,000
4000000,000
5000000,000
6000000,000
7000000,000
USUnitedStates

Output 6: Customer Descriptive Statistics (Overall)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
opened	63	51,0	89,0	68,952	11,4799
solved	63	40,0	89,0	63,206	14,4414
Male	63	41,0	65,0	54,889	5,6486
oldpurchase	63	21,0	90,0	53,127	21,1626
newfeature	63	10,0	79,0	46,873	21,1626
Female	63	35,0	59,0	45,111	5,6486
University	63	26,0	50,0	39,683	7,0524
MSC	63	2,0	56,0	35,571	17,7152
HighSchool	63	1,0	72,0	24,587	19,4095
Valid N (listwise)	63				

Values are represented in %.

Opened system problems are higher than solved problems in overall.

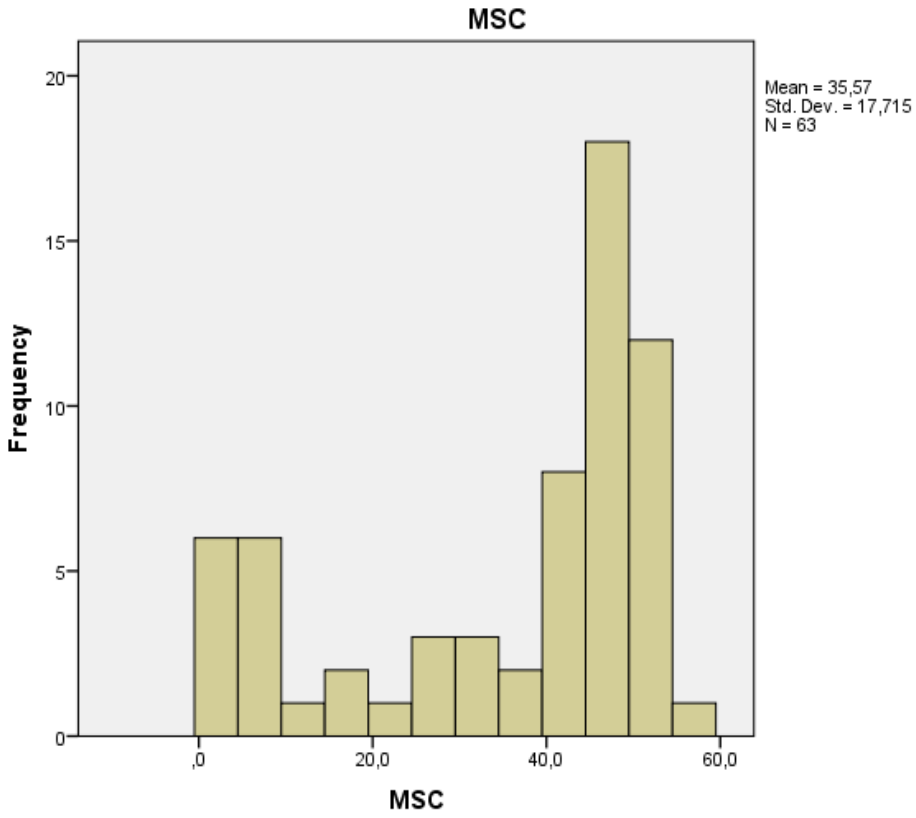
Male customers' numbers are greater than female customers in overall.

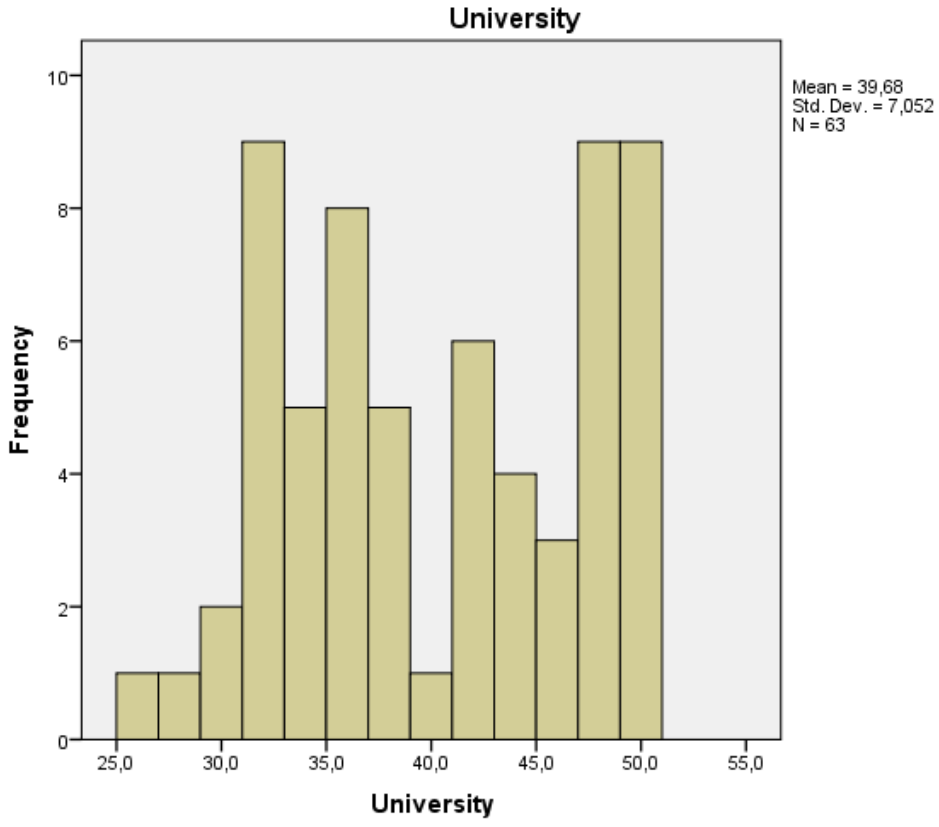
Old purchase demands are greater than new features demands on working system in overall.

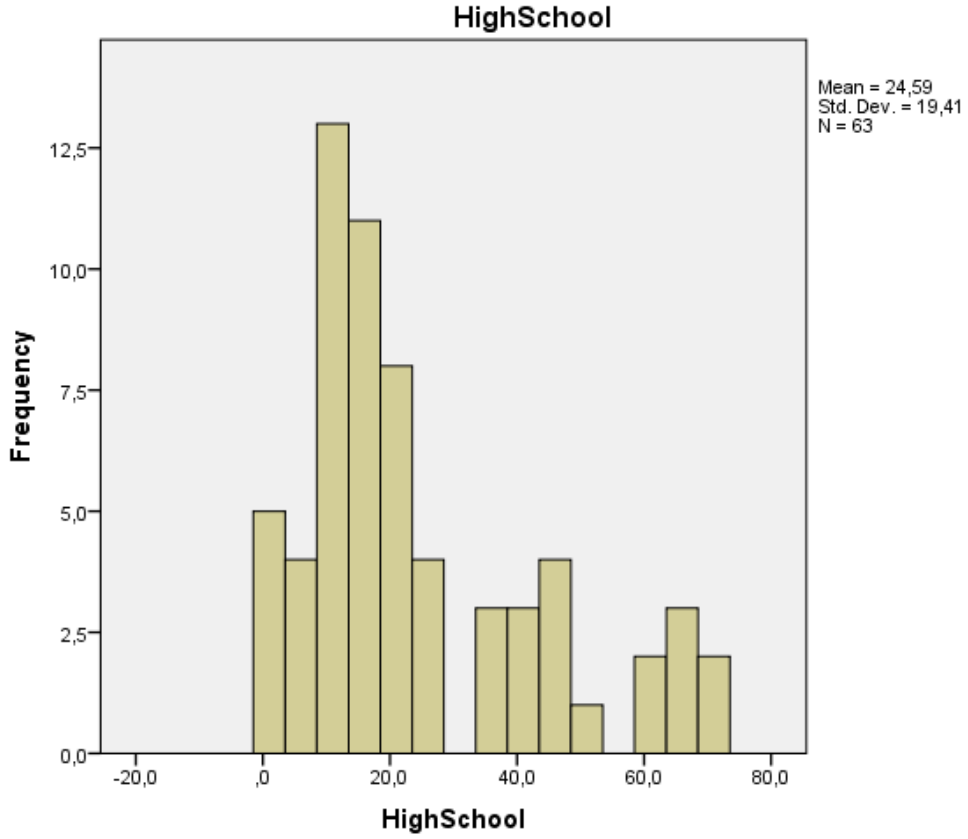
Banking sectors' customers' educational status is high level. Customers who have only high school degree are the lowest one. Customers who have University degree are greater than who have additional Master degree.

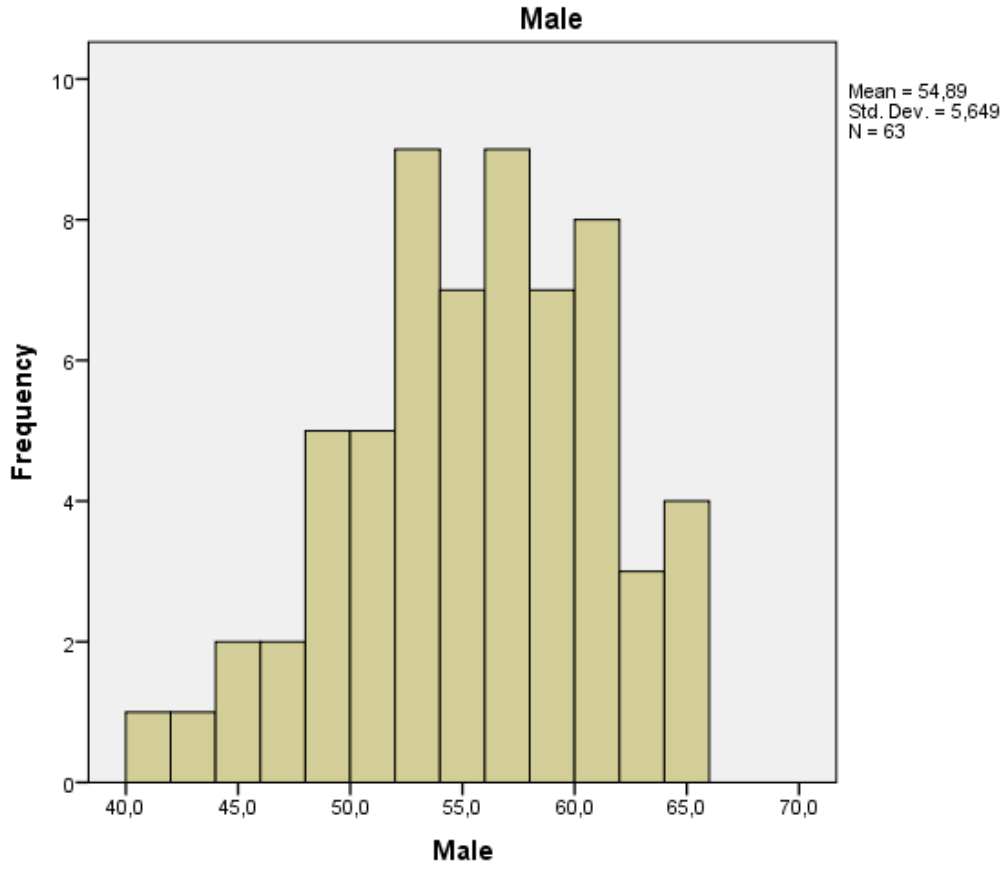
Outlier and extreme values can be observed on frequency Figures which are given below:

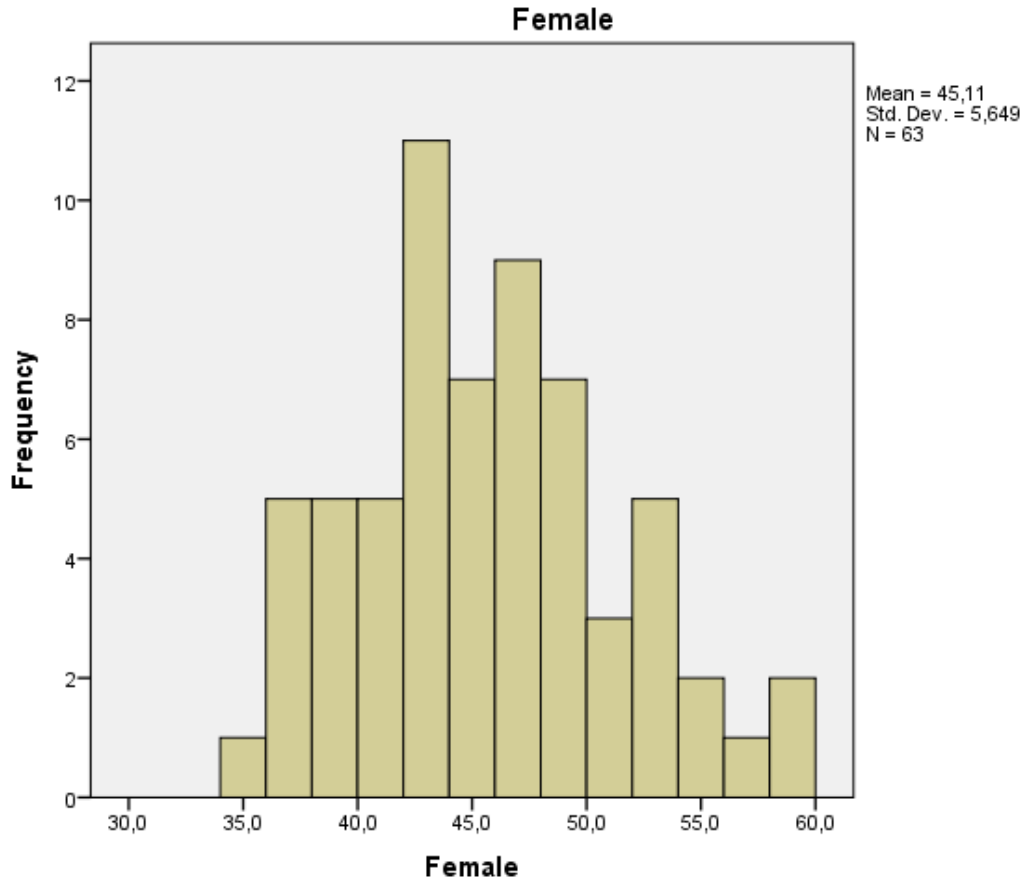
Output 7: Frequency Outputs of Customer Data

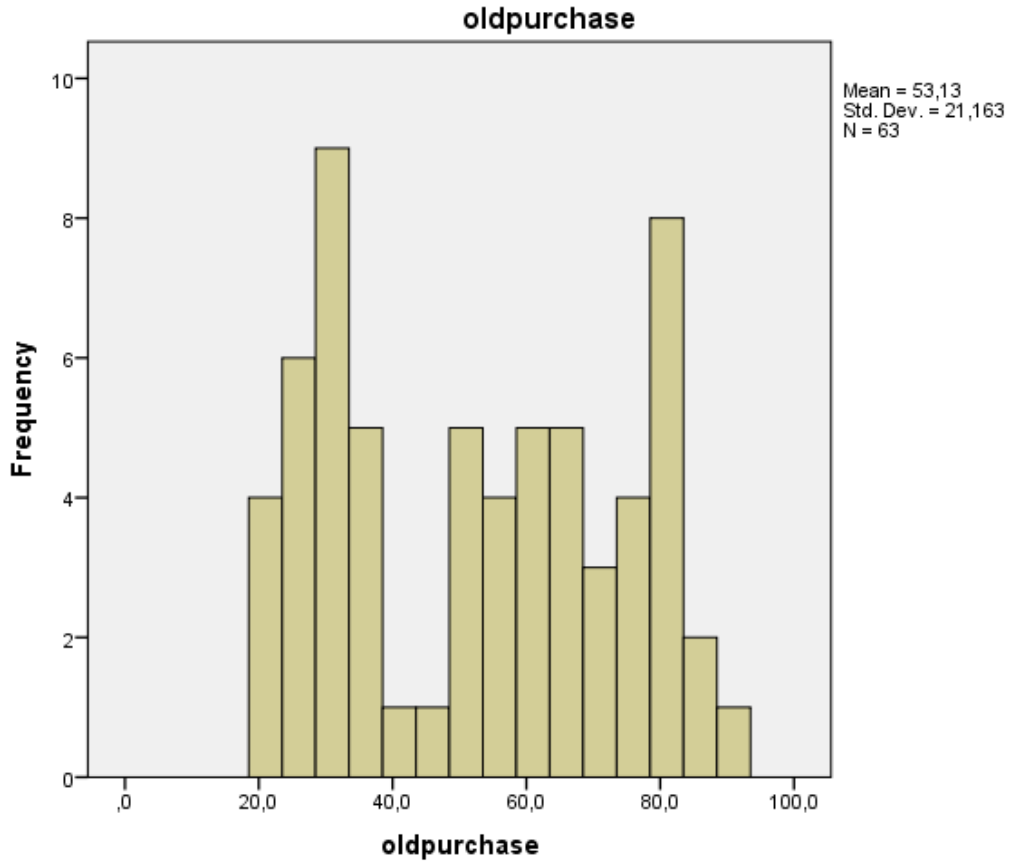


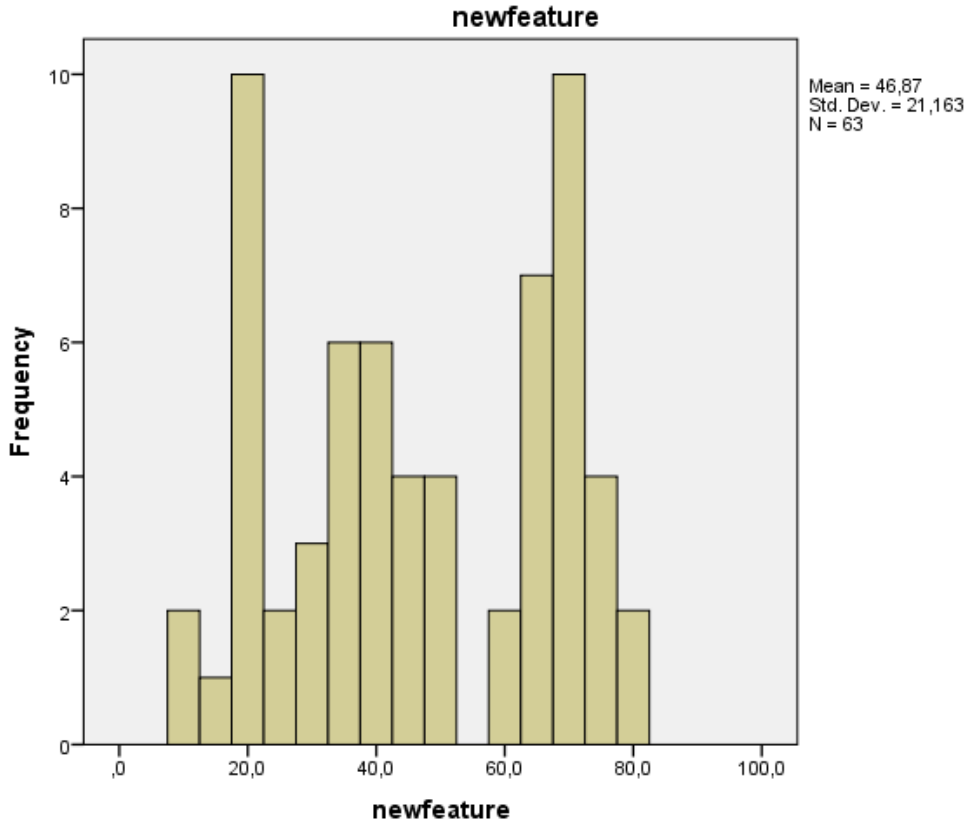


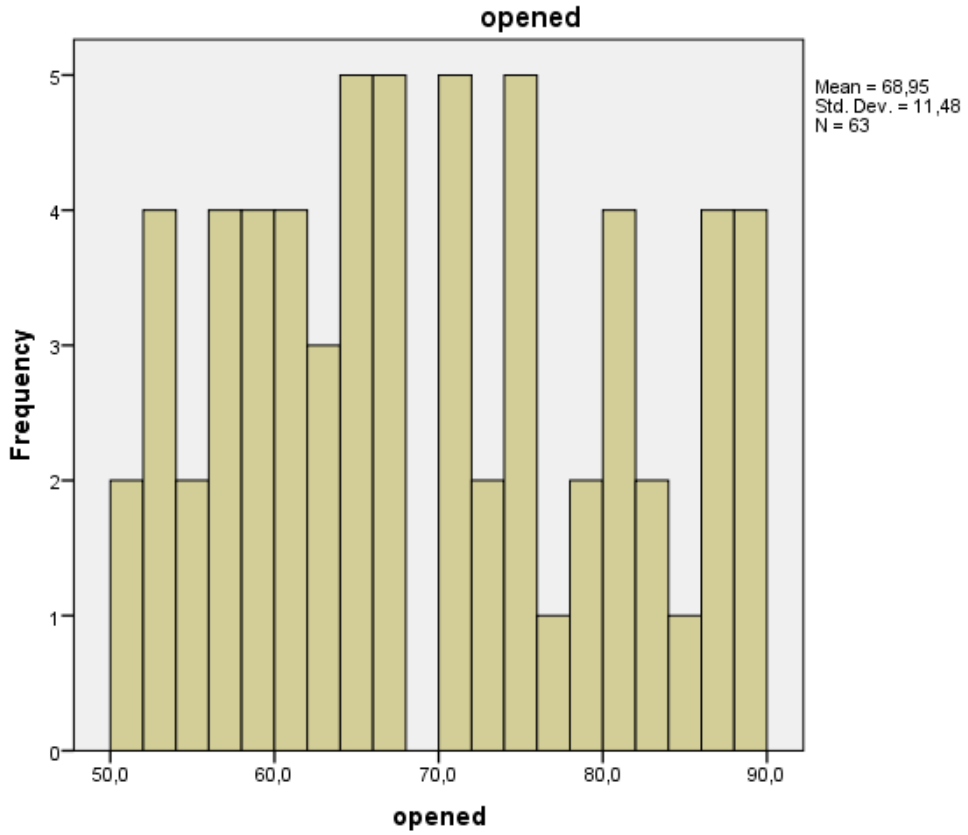

HighSchool
Mean = 24,59
Std. Dev. = 19,41
N = 63
Frequency
12,5
10,0
7,5
5,0
2,5
0,0
-20,0
,0
20,0
40,0
60,0
80,0
HighSchool

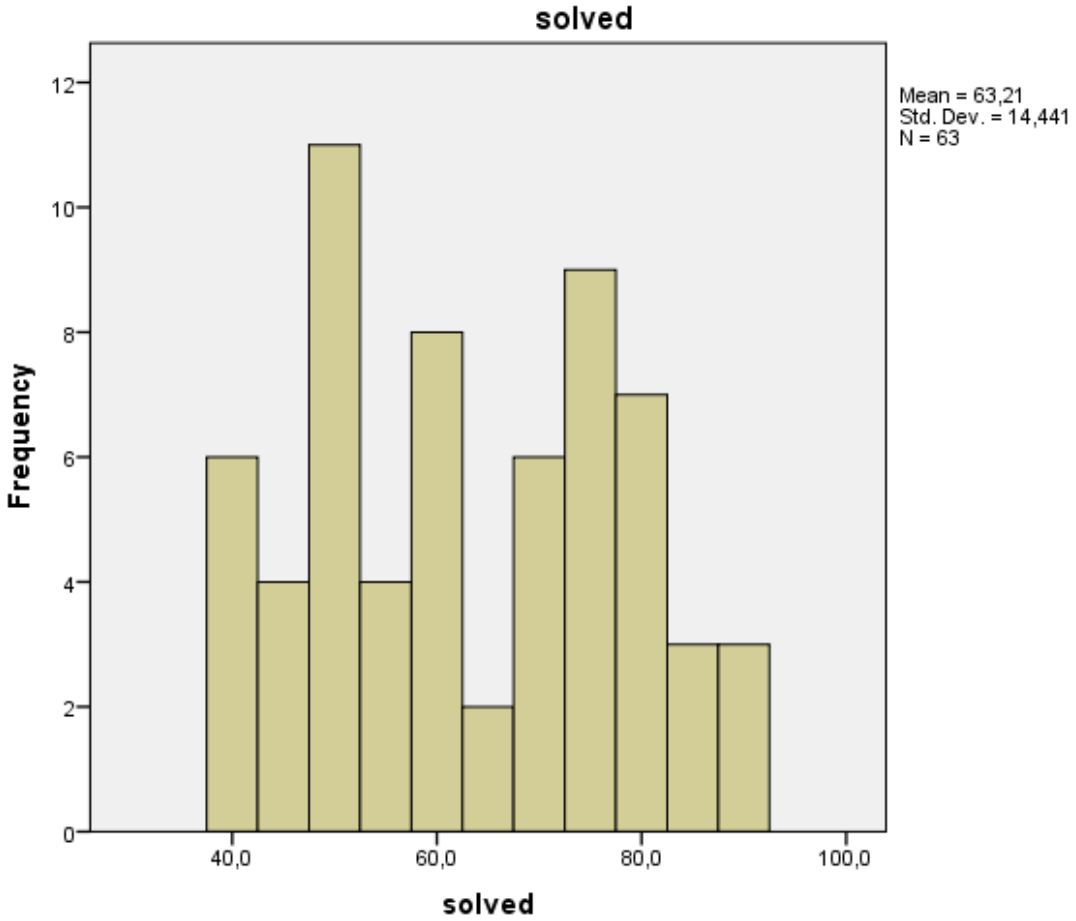

Male
Mean = 54,89
Std. Dev. = 5,649
N = 63
Frequency
10
8
6
4
2
0
40,0
45,0
50,0
55,0
60,0
65,0
70,0
Male


Female
Mean = 45,11
Std. Dev. = 5,649
N = 63
Frequency
0
2
4
6
8
10
12
30,0
35,0
40,0
45,0
50,0
55,0
60,0
Female


oldpurchase
Mean = 53,13
Std. Dev. = 21,163
N = 63
Frequency
0
2
4
6
8
10
,0
20,0
40,0
60,0
80,0
100,0
oldpurchase


newfeature
Mean = 46,87
Std. Dev. = 21,163
N = 63
Frequency
newfeature
0
2
4
6
8
10
,0
20,0
40,0
60,0
80,0
100,0


opened
Mean = 68,95
Std. Dev. = 11,48
N = 63
Frequency
opened
0
1
2
3
4
5
50,0
60,0
70,0
80,0
90,0


solved
Mean = 63,21
Std. Dev. = 14,441
N = 63
Frequency
0
2
4
6
8
10
12
40,0
60,0
80,0
100,0
solved

4.2.2 CORRELATION ANALYSIS

To understand if index of technology and country cash flow is related, correlation analysis technique is applied to the data. The method is used named Bivariate (Pearson) Correlation: correlation means exactly relation. Correlation generally describes the effect that two or more phenomena occur together and therefore they are linked. Many academic questions and theories investigate these relationships.

4.2.2.1 Correlation Analysis: Austria

H0: There is no relationship between Austria Cash Amount and Austria technology index.

H1: There isrelationship between Austria Cash Amount and Austria technology index.

ATAustria_A: shows cash amount of Austria

percentage_at: shows technology index of Austria

```
CORRELATIONS
  /VARIABLES=ATAustria_Apercentage_at
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
ATAustria_A	386697,32169	129414,529161	16
percentage_at	2,2731	,19598	16

This analysis shows the mean and standard deviation of two variables. In Austria, the mean of cash amount is 38.6697,32 while the technology index mean is 2,27.

Correlations

		ATAustria_A	percentage_at
ATAustria_A	Pearson Correlation	1	,909**
	Sig. (2-tailed)		**,000**
	N	16	16
percentage_at	Pearson Correlation	,909**	1
	Sig. (2-tailed)	**,000**	
	N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables.

According to the data, significanceis 0,0. This means that there is strong relationship between index and the cash amount in Austria.

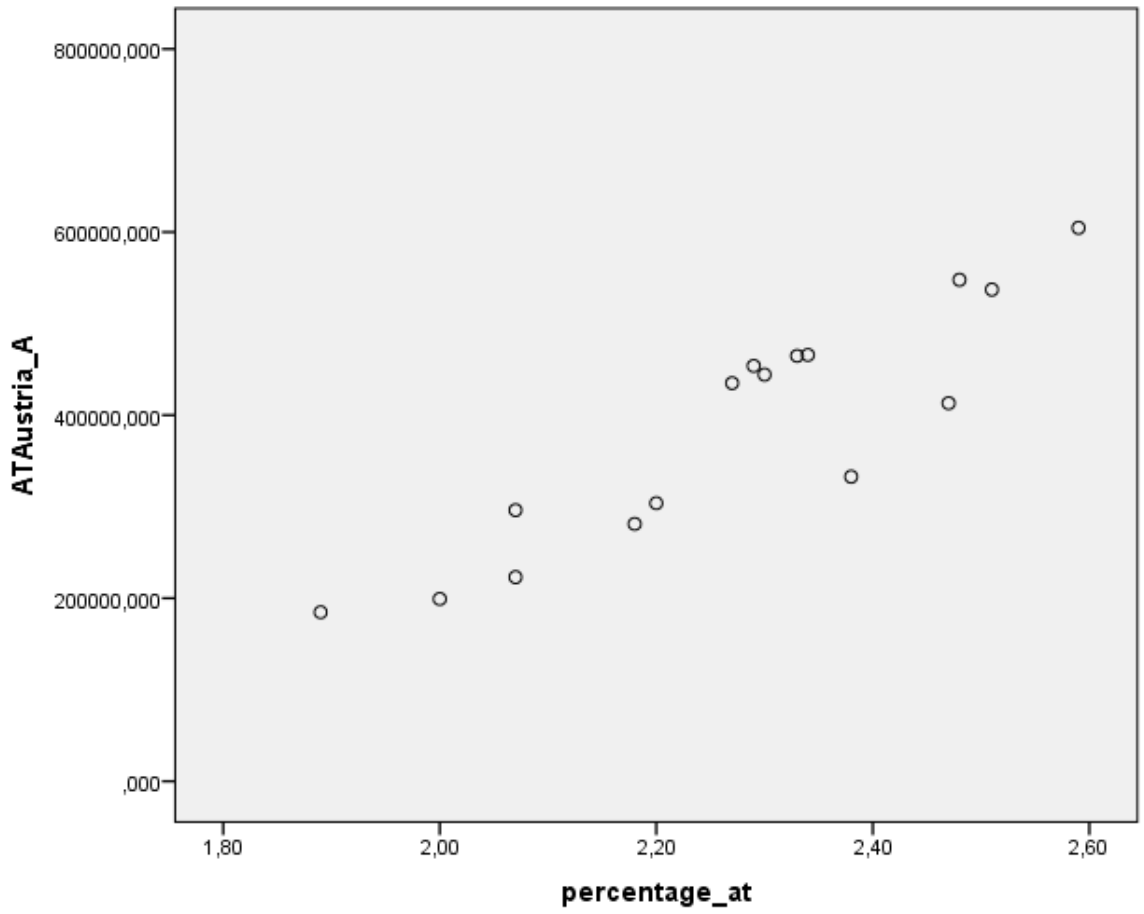
Moreover, Pearson Correlation is close to 1 (0,909).Thismeans that there is a strong relationship between two variables. This means that changes in one variable are strongly correlated with changes in the second variable.

Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_at WITH ATAustria_A
  /MISSING=LISTWISE.
```



4.2.2.2 Correlation Analysis: Belgium

H0: There is no relationship between Belgium Cash Amount and Belgium technology index.

H1: There is relationship between Belgium Cash Amount and Belgium technology index.

BEBelgium_A: shows cash amount of Belgium

percentage_be: shows technology index of Belgium

```
CORRELATIONS
  /VARIABLES=BEBelgium_Apercentage_be
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
BEBelgium_A	1733668,30788	659056,675000	16
percentage_be	1,9425	,48526	16

This analysis shows the mean and standard deviation of two variables. In Belgium, the mean of cash amount is 1.733.668,30 while the technology index mean is 1,94.

Correlations

		BEBelgium_A	percentage_be
BEBelgium_A	Pearson Correlation	1	,517*
	Sig. (2-tailed)		,040
	N	16	16
percentage_be	Pearson Correlation	,517*	1
	Sig. (2-tailed)	,040	
	N	16	16

*. Correlation is significant at the 0.05 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significanceis 0,040. This means that there is relationship between index and the cash amount in Belgium.

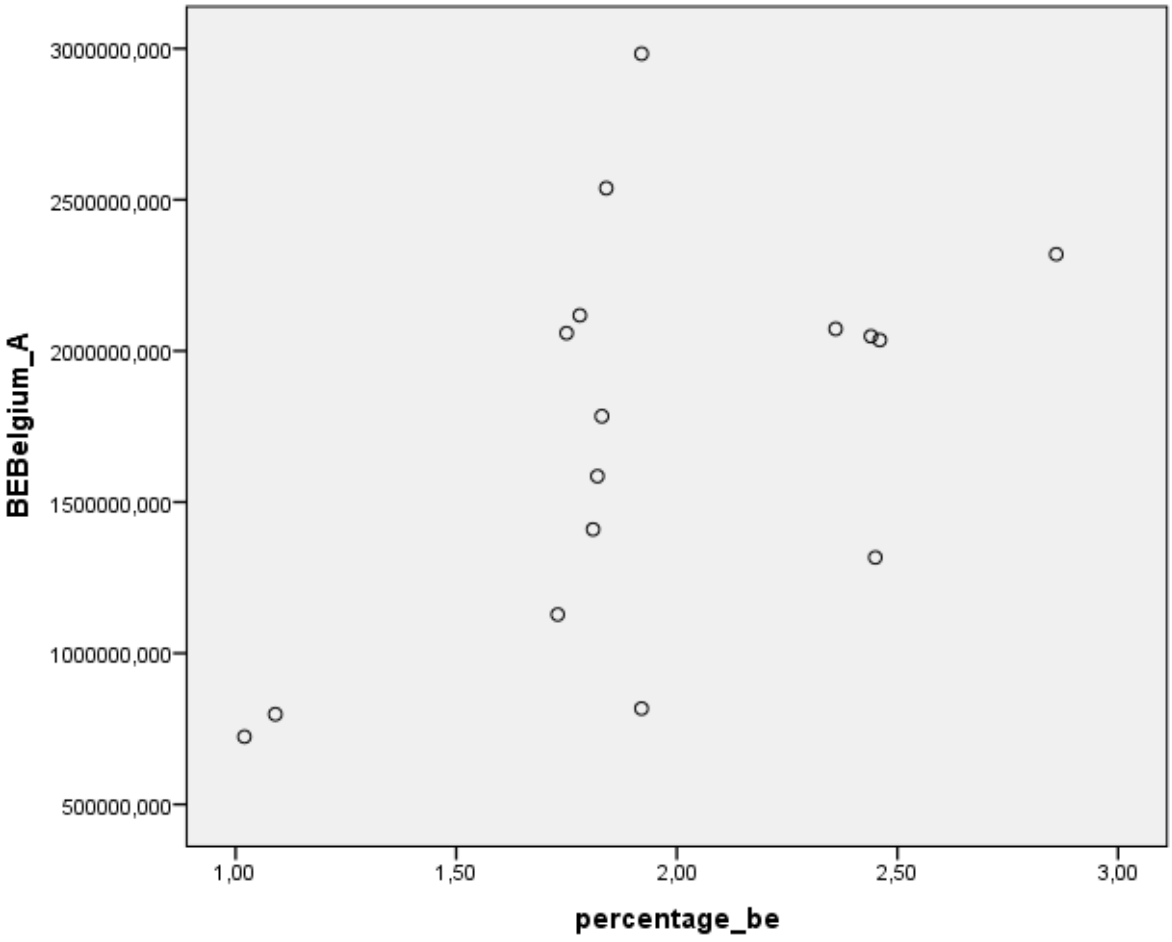
Moreover, Pearson Correlation is higher than 0,5 (0,517). This means that there is a relationship between two variables but it is not very strong relationship like Austria. This means anyway that changes in one variable are correlated with changes in the second variable.

Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_be WITH BEBelgium_A
  /MISSING=LISTWISE.
```



4.2.2.3 Correlation Analysis: Colombia

H0: There is no relationship between Colombia Cash Amount and Colombia technology index.

H1: There isrelationship between Colombia Cash Amount and Colombia technology index.

COColombia_A: shows cash amount of Colombia

percentage_co: shows technology index of Colombia

```
CORRELATIONS
  /VARIABLES=COColombia_Apercentage_co
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
COColombia_A	53233,03081	15680,389648	16
percentage_co	2,5519	,39333	16

This analysis shows the mean and standard deviation of two variables. In Colombia, the mean of cash amount is 53.233,03 while the technology index mean is 2,55.

Correlations

		COColombia_A	percentage_co
COColombia_A	Pearson Correlation	1	,909**
	Sig. (2-tailed)		,000
	N	16	16
percentage_co	Pearson Correlation	,909**	1
	Sig. (2-tailed)	,000	
	N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significanceis 0,000. This means that there is strong relationship between index and the cash amount in Colombia.

Moreover, Pearson Correlation is close to 1 (0,909). This means that there is a strong relationship between two variables but it is very strong relationship like Austria. This meansthat changes in one variable are correlated with changes in the second variable.

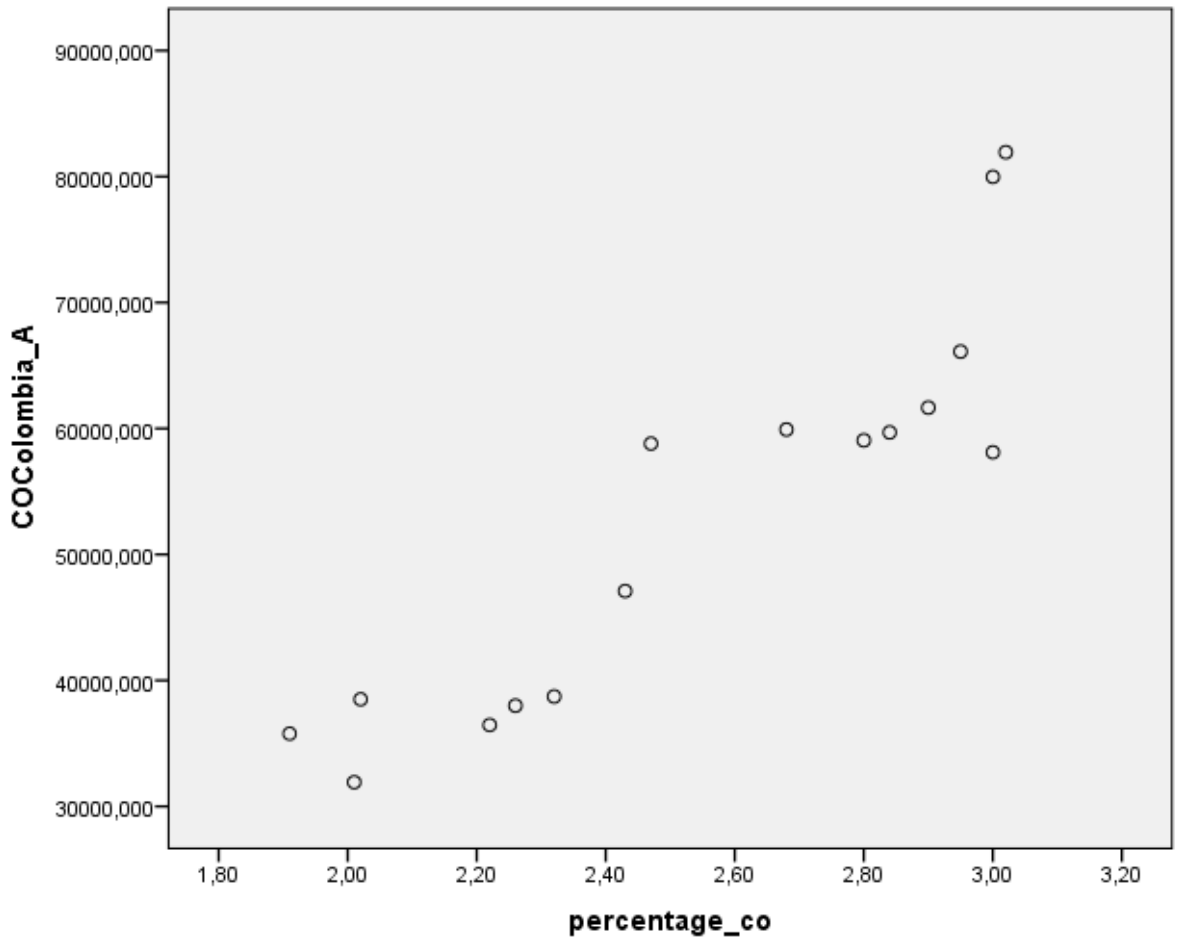
Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_co WITH COColombia_A
  /MISSING=LISTWISE.
```

Graph



4.2.2.4 Correlation Analysis: Cyprus

H0: There is no relationship between Cyprus Cash Amount and Cyprus technology index.

H1: There isrelationship between Cyprus Cash Amount and Cyprus technology index.

CYCyprus_A: shows cash amount of Cyprus

percentage_cy: shows technology index of Cyprus

```
CORRELATIONS
  /VARIABLES=CYCyprus_Apercentage_cy
```

Descriptive Statistics

	Mean	Std. Deviation	N
CYCyprus_A	127475,39056	69433,352473	16
percentage_cy	,4875	,09384	16

This analysis shows the mean and standard deviation of two variables. In Cyprus, the mean of cash amount is 12.747.539,056 while the technology index mean is 0,48.

Correlations

		CYCyprus_A	percentage_cy
CYCyprus_A	Pearson Correlation	1	,805**
	Sig. (2-tailed)		,000
	Sum of Squares and Cross-products	72314856534,060	78688,900
	Covariance	4820990435,604	5245,927
	N	16	16
percentage_cy	Pearson Correlation	,805**	1
	Sig. (2-tailed)	,000	
	Sum of Squares and Cross-products	78688,900	,132
	Covariance	5245,927	,009
	N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significance is 0,000. This means that there is strong relationship between index and the cash amount in Cyprus.

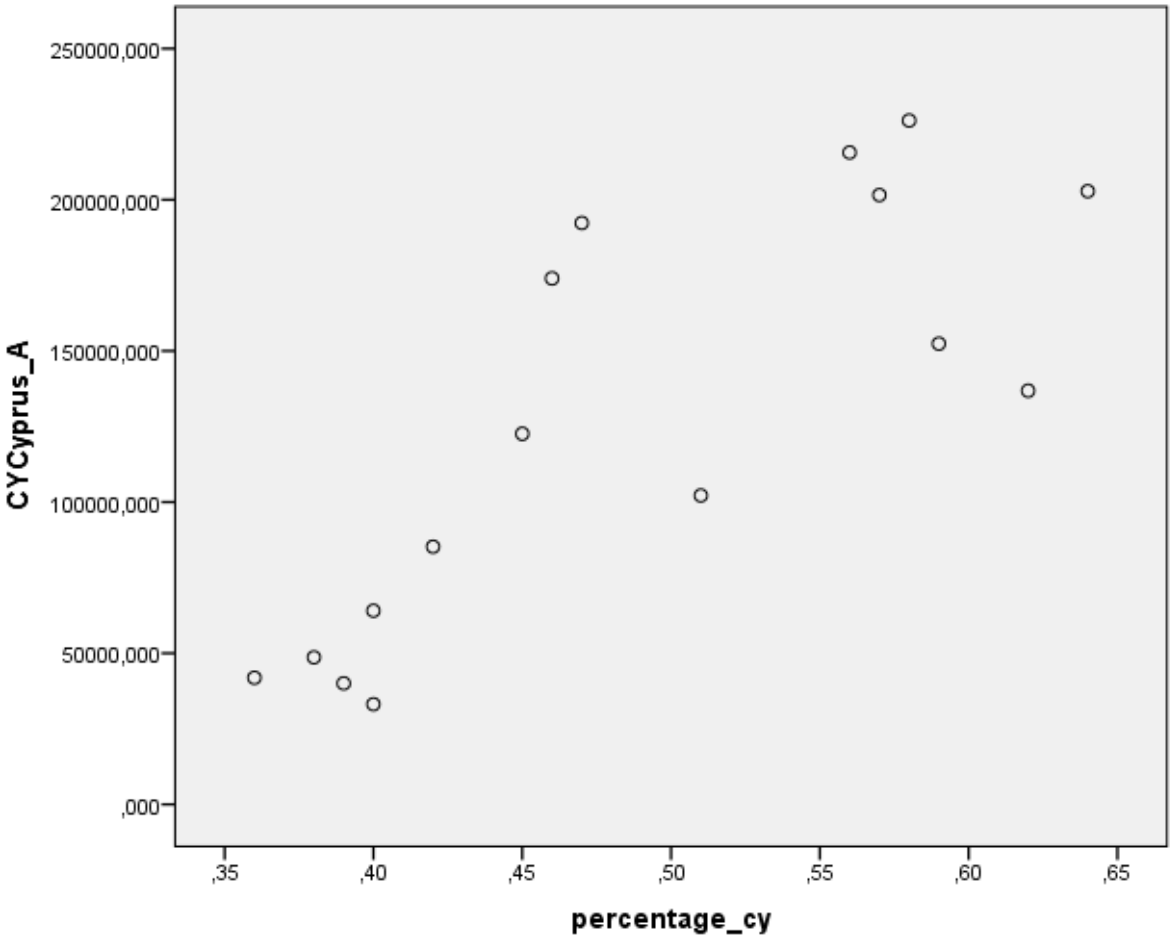
Moreover, Pearson Correlation is close to 1 (0,805). This means that there is a strong relationship between two variables but it is very strong relationship like Austria. This meansthat changes in one variable are correlated with changes in the second variable.

Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_cy WITH CYCyprus_A
  /MISSING=LISTWISE.
```



4.2.2.5 Correlation Analysis: Germany

H0: There is no relationship between Germany Cash Amount and Germany technology index.

H1: There is relationship between Germany Cash Amount and Germany technology index.

DEGermany_A: shows cash amount of Germany

percentage_de: shows technology index of Germany

```
CORRELATIONS
  /VARIABLES=DEGermany_Apercentage_de
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
DEGermany_A	5770395,84300	2181999,614192	16
percentage_de	2,6063	,19896	16

This analysis shows the mean and standard deviation of two variables. In Germany, the mean of cash amount is 57.7039.584,300while the technology index mean is 2,60.

Correlations

		DEGermany_A	percentage_de
DEGermany_A	Pearson Correlation	1	,606*
	Sig. (2-tailed)		,013
	Sum of Squares and Cross-products	71416834745032,880	3947562,916
	Covariance	4761122316335,525	263170,861
	N	16	16
percentage_de	Pearson Correlation	,606*	1
	Sig. (2-tailed)	,013	
	Sum of Squares and Cross-products	3947562,916	,594
	Covariance	263170,861	,040
	N	16	16

*. Correlation is significant at the 0.05 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significance is 0,013. This means that there is relationship but no it is not strong relationship between index and the cash amount in Germany.

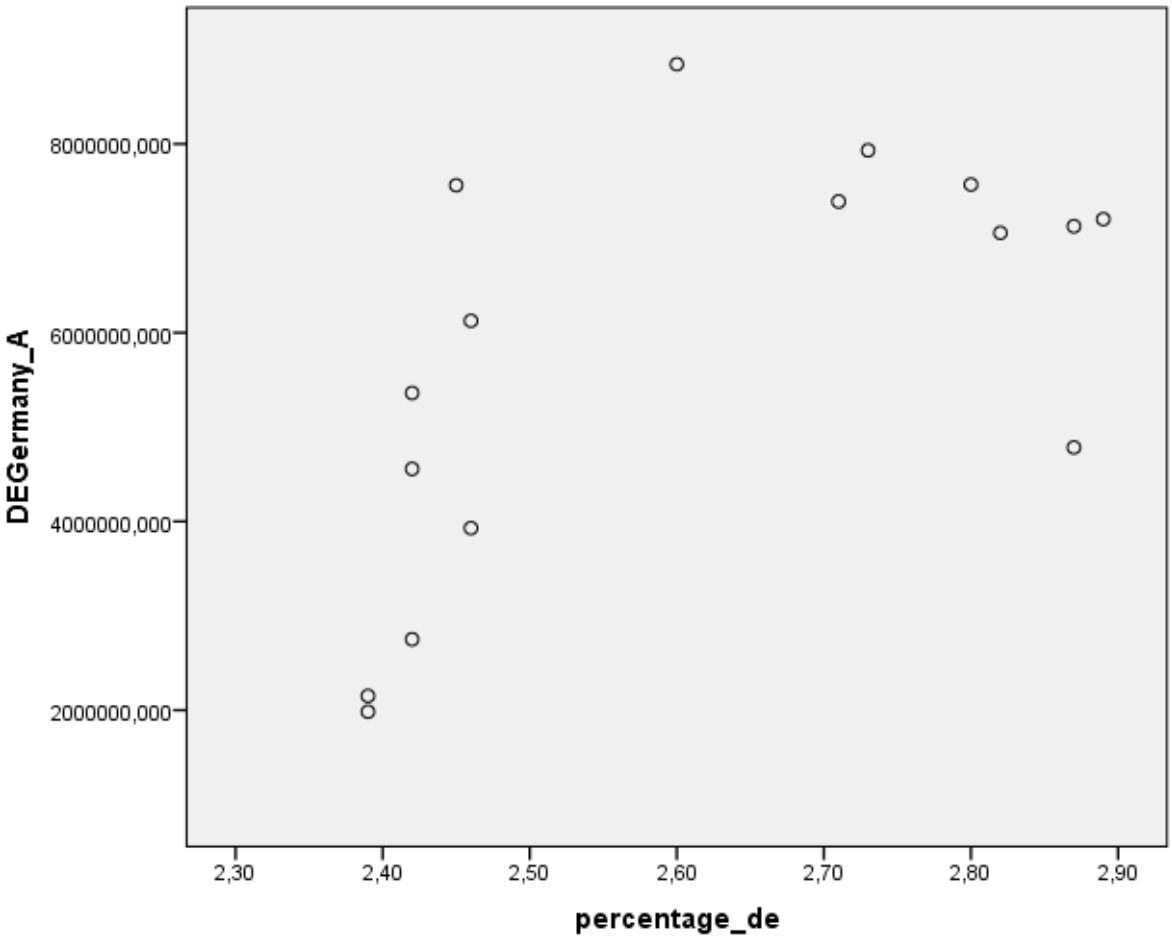
Moreover, Pearson Correlation is closer to 1 instead of 0 (0,606). This means that there is a relationship between two variables but it is not very strong relationship like Austria. This meansthat changes in one variable are correlated with changes in the second variable but change is very weak. Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_de WITH DEGermany_A
  /MISSING=LISTWISE.
```

Graph



4.2.2.6 Correlation Analysis: Estonia

H0: There is no relationship between Estonia Cash Amount and Estonia technology index.

H1: There is relationship between Estonia Cash Amount and Estonia technology index.

EEEstonia_A: shows cash amount of Estonia

percentage_ee: shows technology index of Estonia

```
CORRELATIONS
  /VARIABLES=EEEstonia_Apercentage_ee
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
EEEstonia_A	9395,54525	5240,562960	16
percentage_ee	1,2563	,50982	16

This analysis shows the mean and standard deviation of two variables. In Estonia, the mean of cash amount is 939.554,525 while the technology index mean is 1,25.

Correlations

		EEEstonia_A	percentage_ee
EEEstonia_A	Pearson Correlation	1	,818**
	Sig. (2-tailed)		,000
	Sum of Squares and Cross-products	411952502,106	32766,979
	Covariance	27463500,140	2184,465
	N	16	16
percentage_ee	Pearson Correlation	,818**	1
	Sig. (2-tailed)	,000	
	Sum of Squares and Cross-products	32766,979	3,899
	Covariance	2184,465	,260
	N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significance is 0,00. This means that there is strong relationship between index and the cash amount in Estonia.

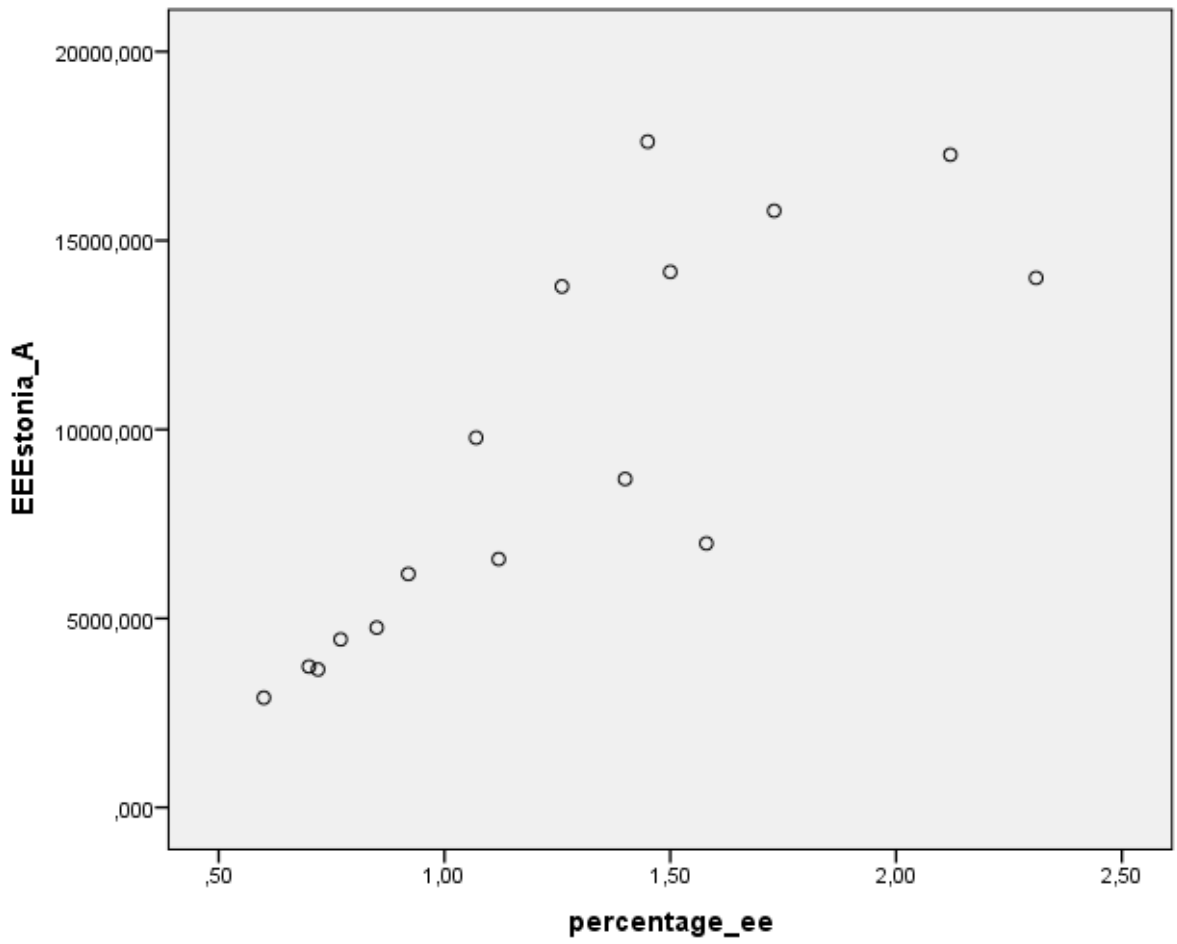
Moreover, Pearson Correlation is very close to 1(0,818). This means that there is a strong relationship between two variables. This meansthat changes in one variable are correlated with changes in the second variable.

Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_ee WITH EEEstonia_A
  /MISSING=LISTWISE.
```



4.2.2.7 Correlation Analysis: Spain

H0: There is no relationship between Estonia Cash Amount and Estonia technology index.

H1: There isrelationship between Estonia Cash Amount and Estonia technology index.

ESSpain_A: shows cash amount of Spain

percentage_es: shows technology index of Spain

```
CORRELATIONS
  /VARIABLES=ESSpain_Apercentage_es
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
ESSpain_A	890792,44075	353704,741114	16
percentage_es	1,1663	,16309	16

This analysis shows the mean and standard deviation of two variables. In Spain, the mean of cash amount is 89.079.244,075while the technology index mean is 1,16.

Correlations

		ESSpain_A	percentage_es
ESSpain_A	Pearson Correlation	1	,871**
	Sig. (2-tailed)		,000
	Sum of Squares and Cross-products	1876605658296,997	753876,245
	Covariance	125107043886,466	50258,416
	N	16	16
percentage_es	Pearson Correlation	,871**	1
	Sig. (2-tailed)	,000	
	Sum of Squares and Cross-products	753876,245	,399
	Covariance	50258,416	,027
	N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables.

According to the data, significance is 0,00. This means that there is strong relationship between index and the cash amount in Spain.

Moreover, Pearson Correlation is very close to 1 (0,871). This means that there is a strong relationship between two variables. This meansthat changes in one variable are correlated with changes in the second variable.

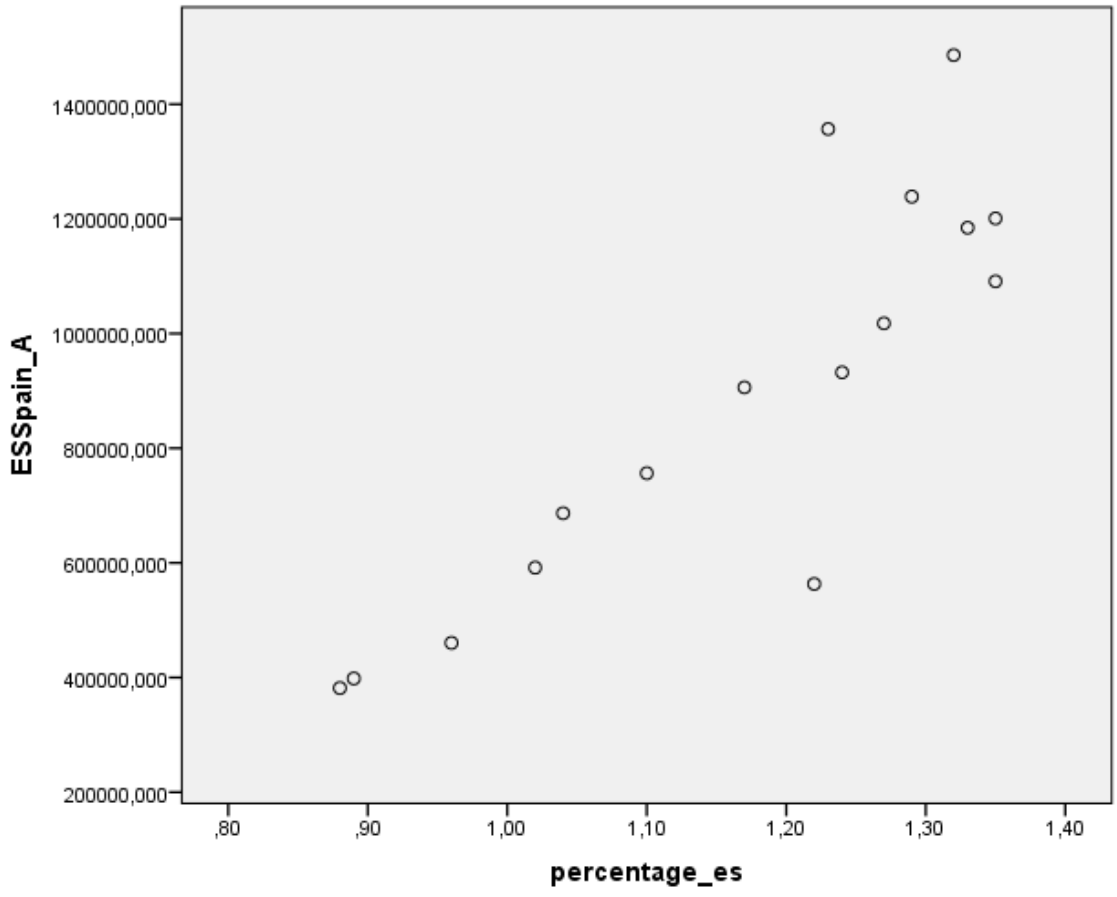
Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_es WITH ESSpain_A
  /MISSING=LISTWISE.
```

Graph



4.2.2.8 Correlation Analysis: Finland

H0: There is no relationship between FinlandCash Amount and Finlandtechnology index.

H1: There isrelationship between FinlandCash Amount and Finlandtechnology index.

FIFinland_A: shows cash amount of Finland

percentage_fi: shows technology index of Finland

```
CORRELATIONS
  /VARIABLES=FIFinland_Apercentage_fi
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
FIFinland_A	321117,02800	136687,208316	16
percentage_fi	3,3619	,21830	16

This analysis shows the mean and standard deviation of two variables. In Finland, the mean of cash amount is 32.111.702,800while the technology index mean is 3,36.

Correlations

		FIFinland_A	percentage_fi
FIFinland_A	Pearson Correlation	1	,519*
	Sig. (2-tailed)		,040
	Sum of Squares and Cross-products	280250893758,754	232098,292
	Covariance	18683392917,250	15473,219
	N	16	16
percentage_fi	Pearson Correlation	,519*	1
	Sig. (2-tailed)	,040	
	Sum of Squares and Cross-products	232098,292	,715
	Covariance	15473,219	,048
	N	16	16

*. Correlation is significant at the 0.05 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significance is 0,040. This means that there is no strong relationship between index and the cash amount in Finland.

Moreover, Pearson Correlation is closer to 1 instead of 0 (0,519). This means that there is a relationship but notstrong relationship between two variables. This meansthat changes in one variable are correlated with changes in the second variable but change is very weak.

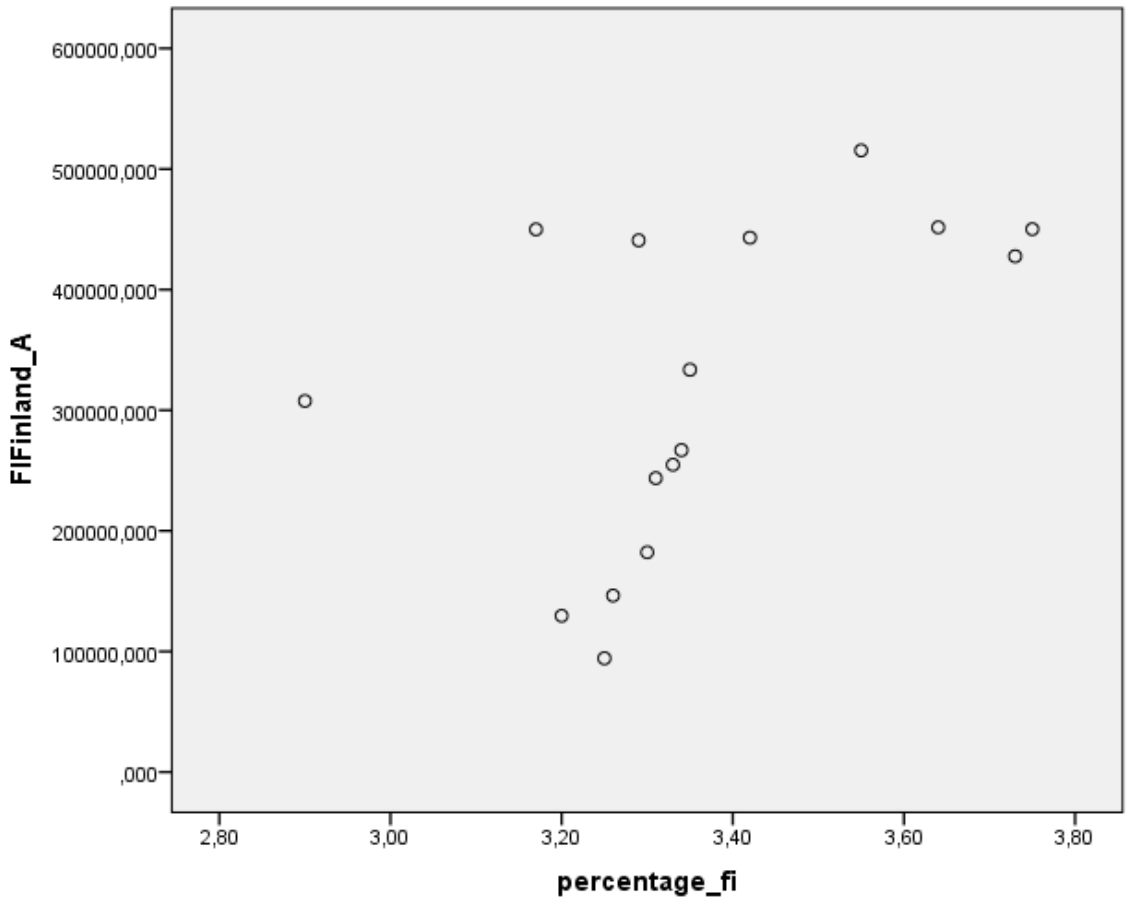
Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_fi WITH FIFinland_A
  /MISSING=LISTWISE.
```

Graph



4.2.2.9 Correlation Analysis: France

H0: There is no relationship between France Cash Amount and France technology index.

H1: There is relationship between France Cash Amount and France technology index.

FRFrance _A: shows cash amount of France

percentage_fr: shows technology index of France

```
CORRELATIONS
  /VARIABLES=FRFrance_Apercentage_fr
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
FRFrance_A	3639894,42125	1495634,204274	16
percentage_fr	2,1419	,07833	16

This analysis shows the mean and standard deviation of two variables. In France, the mean of cash amount is 363.989,442,125while the technology index mean is 2,14.

Correlations

		FRFrance_A	percentage_fr
FRFrance_A	Pearson Correlation	1	,403
	Sig. (2-tailed)		,122
	N	16	16
percentage_fr	Pearson Correlation	,403	1
	Sig. (2-tailed)	,122	
	N	16	16

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significance is 0,122. This means that there is no strong relationship between index and the cash amount in Finland.

Moreover, Pearson Correlation is not very close to 1 but closer to 0 instead of 1 (0,403). This means the relationship between two variables is not meaningful.

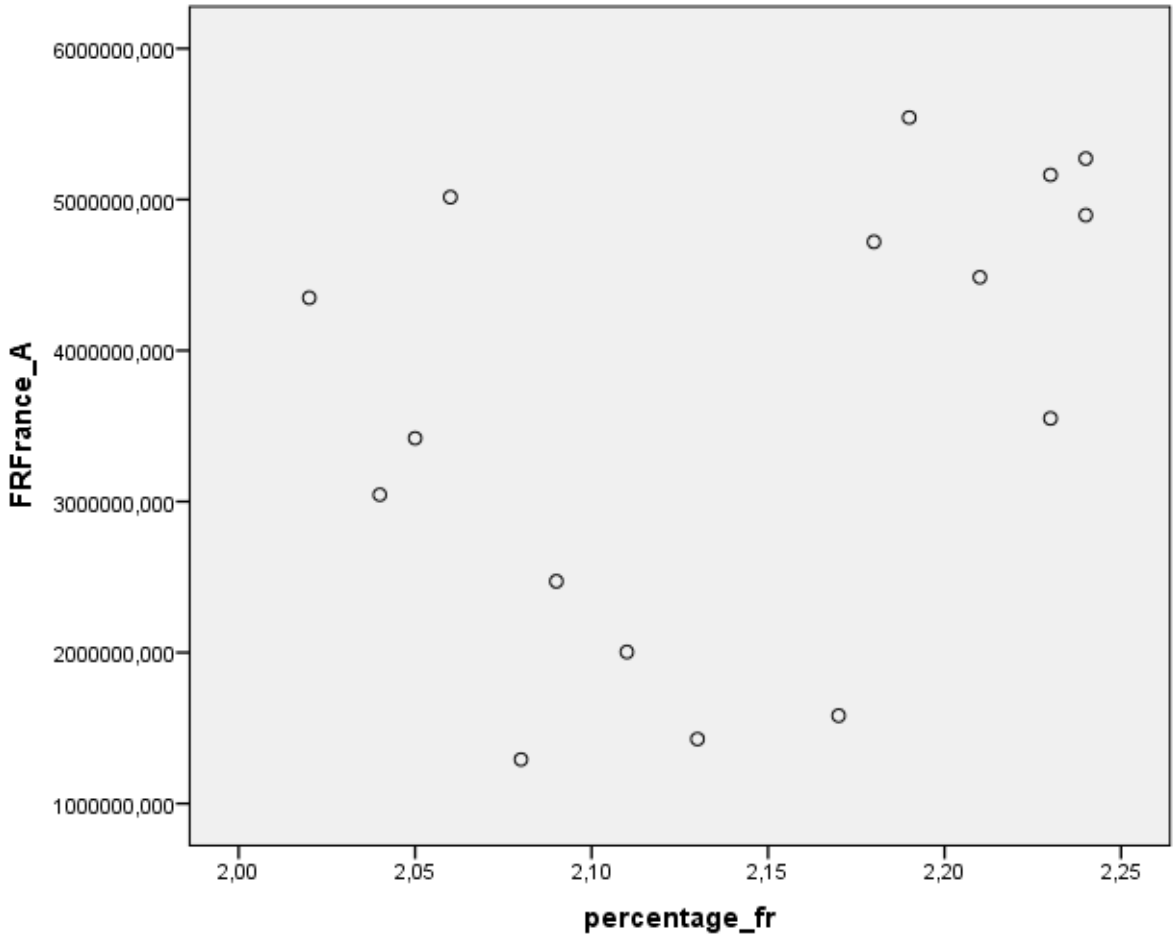
Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is not rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_fr WITH FRFrance_A
  /MISSING=LISTWISE.
```

Graph



4.2.2.10 Correlation Analysis: United Kingdom

H0: There is no relationship between United Kingdom Cash Amount and United Kingdom technology index.

H1: There isrelationship between United KingdomCash Amount and United Kingdomtechnology index.

GBUnitedKingdom _A: shows cash amount of United Kingdom

Percentage_uk: shows technology index of United Kingdom

```
CORRELATIONS
  /VARIABLES=GBUnitedKingdom_Apercentage_uk
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
GBUnitedKingdom_A	145862711,5850	91806384,14603	16
percentage_uk	2,2400	,44873	16

This analysis shows the mean and standard deviation of two variables. In United Kingdom, the mean of cash amount is 1.458,627,115,850while the technology index mean is 2,24.

Correlations

		GBUnitedKingdom_A	percentage_uk
GBUnitedKingdom_A	Pearson Correlation	1	,941**
	Sig. (2-tailed)		,000
	N	16	16
percentage_uk	Pearson Correlation	,941**	1
	Sig. (2-tailed)	,000	
	N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significance is 0,0. This means that there is strong relationship between index and the cash amount in United Kingdom.

Moreover, Pearson Correlation is very close to 1 (0,941). This means the relationship between two variables is very strong.

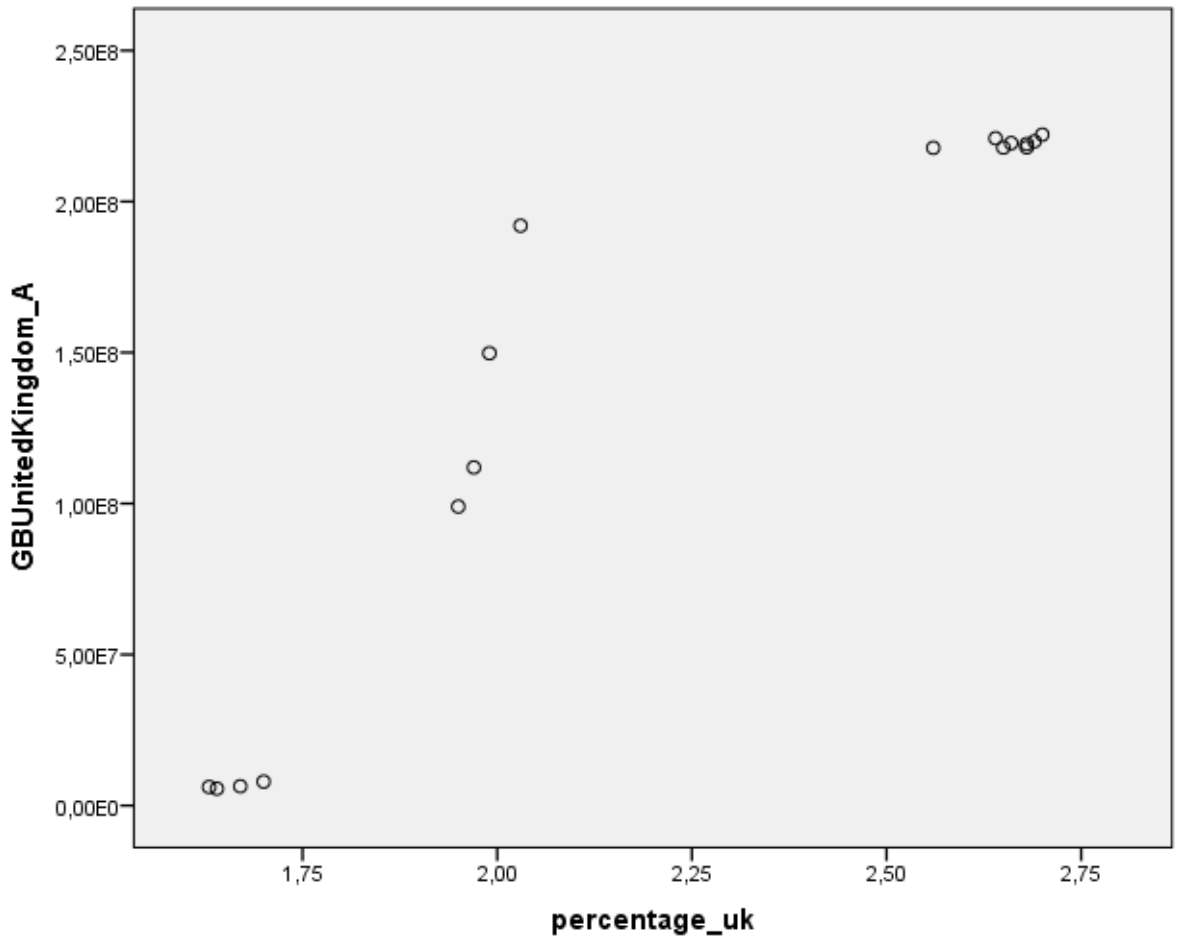
Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_uk WITH GBUnitedKingdom_A
  /MISSING=LISTWISE.
```

Graph



4.2.2.11 Correlation Analysis: Italy

H0: There is no relationship between Italy Cash Amount and Italy technology index.

H1: There isrelationship between ItalyCash Amount and Italytechnology index.

ITItaly _A: shows cash amount of Italy

Percentage_it: shows technology index of Italy

```
CORRELATIONS
  /VARIABLES=ITItaly_Apercentage_it
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
ITItaly_A	1099311,26844	314770,836924	16
percentage_it	1,2438	,11803	16

This analysis shows the mean and standard deviation of two variables. In Italy, the mean of cash amount is 10.993,1126,844while the technology index mean is 1,24.

Correlations

		ITItaly_A	percentage_it
ITItaly_A	Pearson Correlation	1	,922**
	Sig. (2-tailed)		,000
	N	16	16
percentage_it	Pearson Correlation	,922**	1
	Sig. (2-tailed)	,000	
	N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significance is 0,0. This means that there is strong relationship between index and the cash amount in Italy.

Moreover, Pearson Correlation is very close to 1 (0,922). This means the relationship between two variables is very strong.

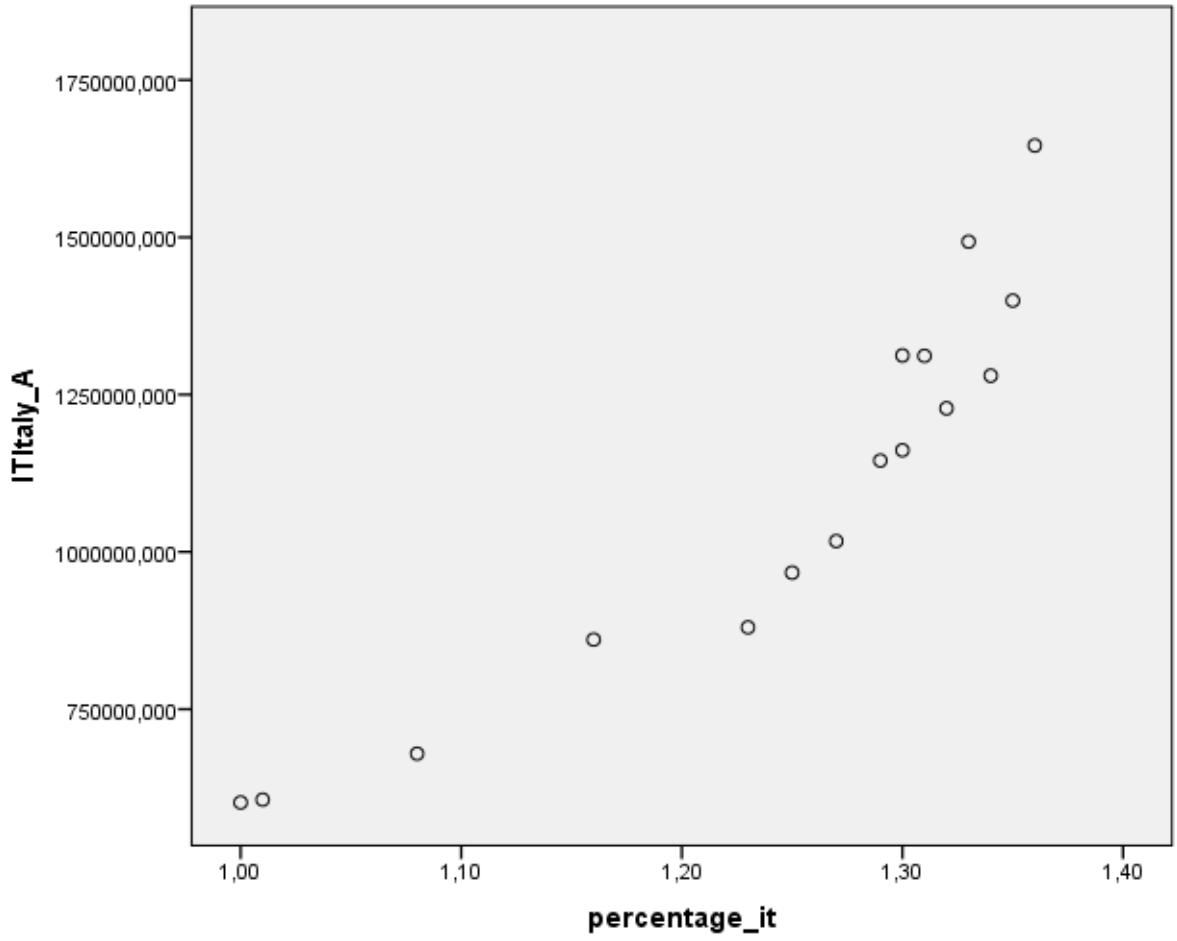
Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_it WITH ITItaly_A
  /MISSING=LISTWISE.
```

Graph



4.2.2.12 Correlation Analysis: Turkey

H0: There is no relationship between Turkey Cash Amount and Turkey technology index.

H1: There is relationship between Turkey Cash Amount and Turkey technology index.

TRTurkey _A: shows cash amount of Turkey

Percentage_tr: shows technology index of Turkey

```
CORRELATIONS
  /VARIABLES=TRTurkey_Apercentage_tr
```

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
TRTurkey_A	155880,17775	64585,260755	16
percentage_tr	,6125	,11750	16

This analysis shows the mean and standard deviation of two variables. In Turkey, the mean of cash amount is 15.588,017,775while the technology index mean is 0,61.

Correlations

		TRTurkey_A	percentage_tr
TRTurkey_A	Pearson Correlation	1	,681**
	Sig. (2-tailed)		,004
	N	16	16
percentage_tr	Pearson Correlation	,681**	1
	Sig. (2-tailed)	,004	
	N	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation table is shows the significance and the relationship if exists between two variables. According to the data, significance is 0,04. This means that there is strong relationship between index and the cash amount in Turkey.

Moreover, Pearson Correlation is closer to 1 instead of 0 (0,681). This means the relationship between two variables is meaningful.

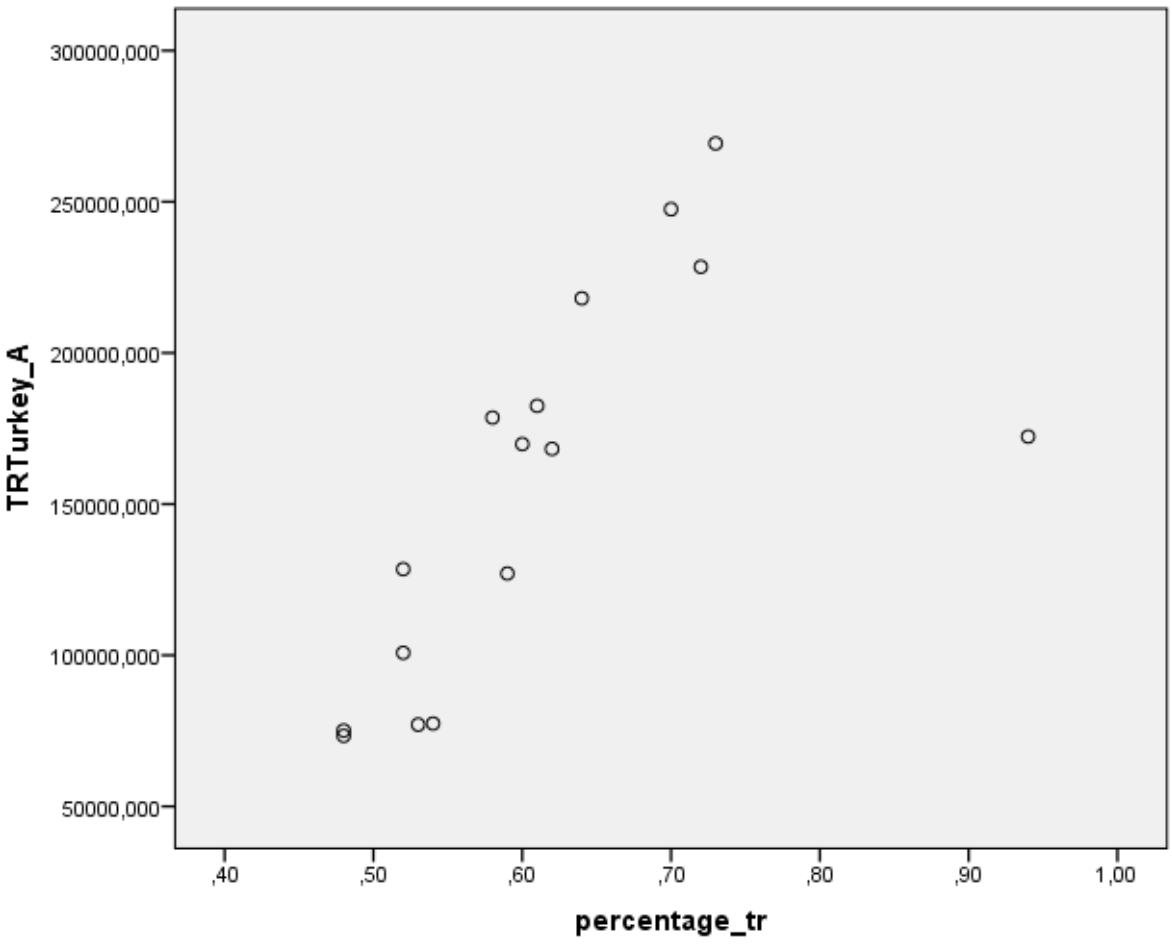
Pearson Correlation is positive. This means that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value.

N variable shows the number of cases in the data. This analysis completed with 16 observed cases (the years between 2000 and 2017).

As a result H0 is rejected.

```
GRAPH
  /SCATTERPLOT(BIVAR)=percentage_tr WITH TRTurkey_A
  /MISSING=LISTWISE.
```

Graph



4.2.3 SUMMARY OF CORRELATION ANALYSIS

Relationship between technology index and cash amount is proved by using the Correlation Analysis: Bivariate Pearson Correlation method. The aim of the analysis is to show is any relationship exists between index and amount. Strong or weak, positive or negative relationships between indexes and amounts were proved. As a result, there is exactly relationship between indexes and cash amounts proved by the Correlation Analysis technique. Briefly, technology indexes affect the cash amounts of countries.

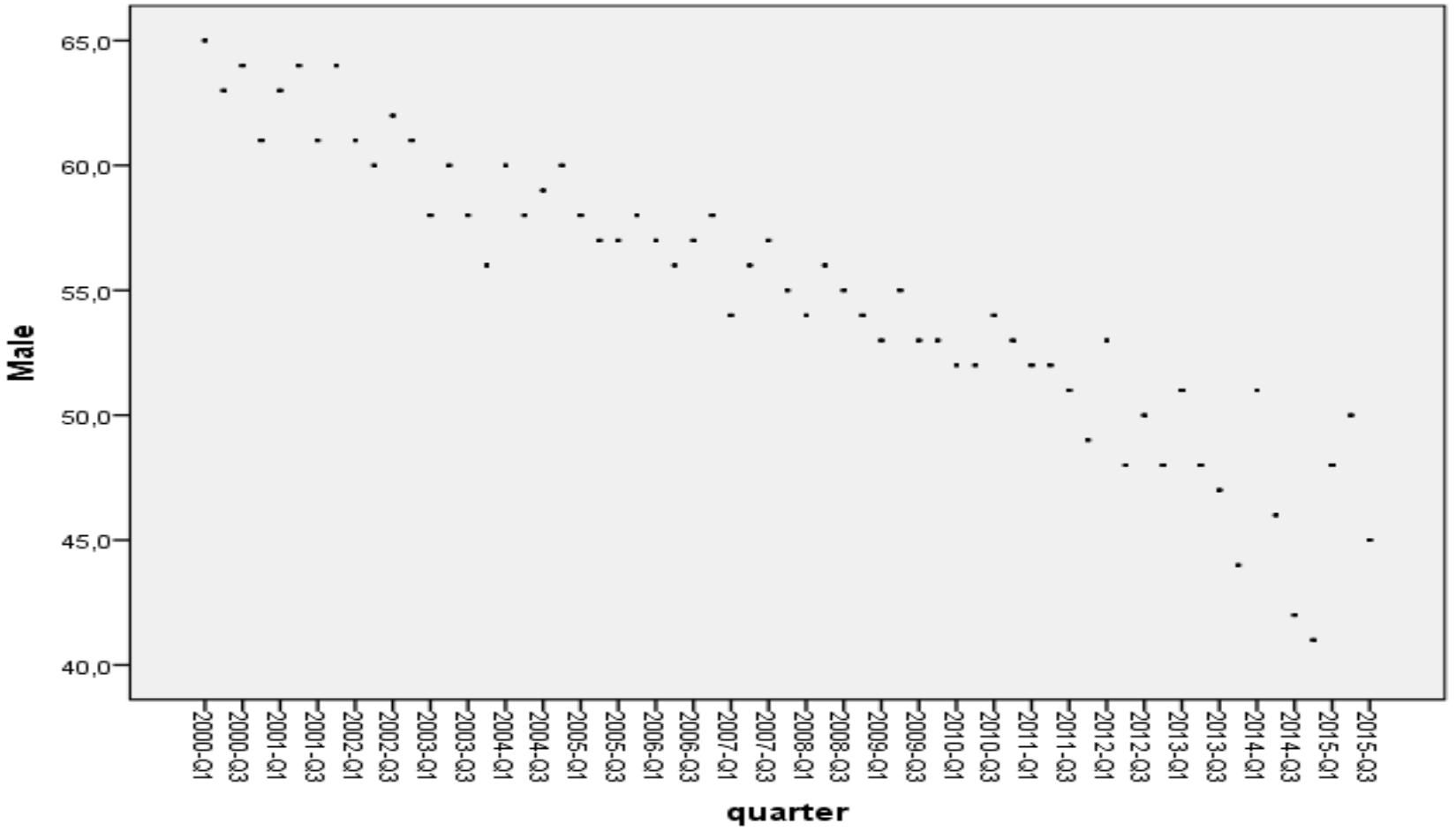
4.2.4 EXPLORE ANALYSIS

According to SPSS, the Explore procedure produces detailed univariate statistics and graphs for numeric scale variables for an entire sample, or for subsets of a sample. It can also be used to assess the normality of a numeric scale variable with special inferential statistics and detailed diagnostic plots.

The Descriptives option produces a set list of descriptive statistics: mean, confidence interval for the mean (default 95% CI), 5% trimmed mean, median, variance, standard deviation, minimum, maximum, range, interquartile range (IQR), skewness, kurtosis, and standard errors for the mean, skewness and kurtosis.

Explore analysis part of this study shows out the distribution of the customers data which are collected from the banks in general (world-wide not country specialized) according to the year scale. The distribution graphs also show that if any relation exists between years and customer data.

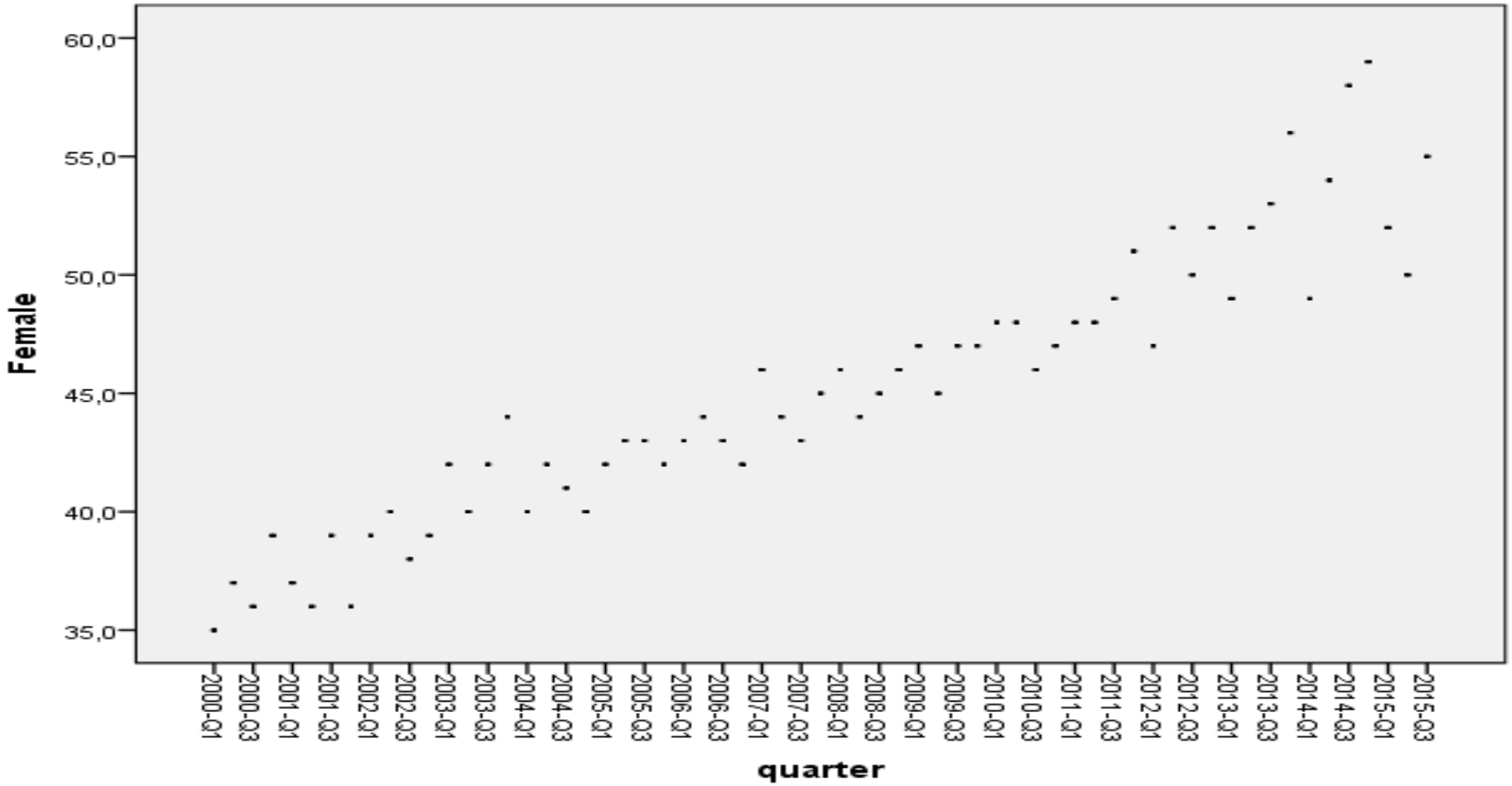
Output 8: Male CustomersPercentageData-Explore Outputs



Male customers' numbers decrease according to quarter terms.

There is relationship between quarter terms and male customers’ number.

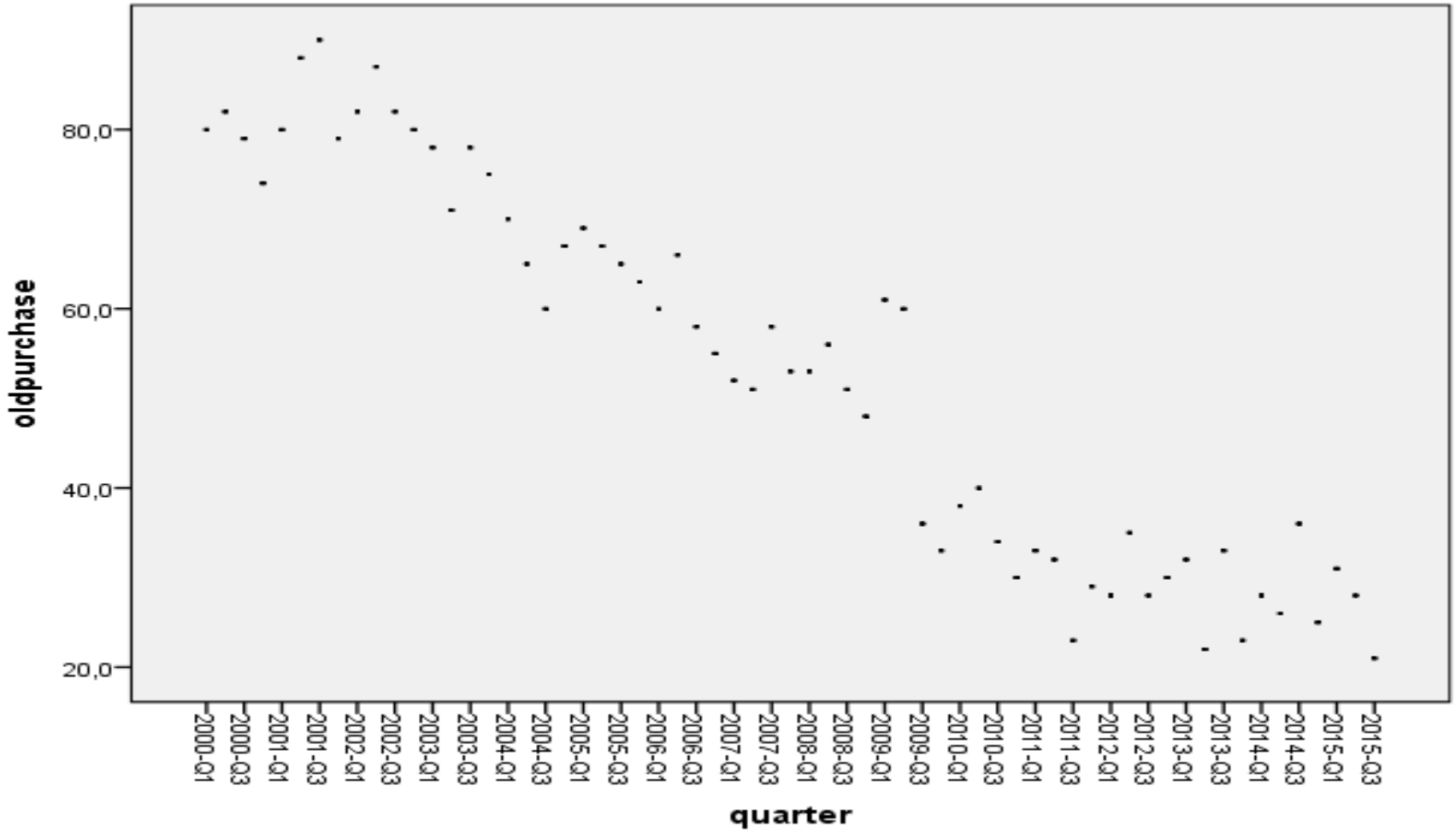
Output 9: Female CustomersPercentageData-Explore Outputs



Female customers' numbers increase according to quarter terms.

There is relationship between quarter terms and female customers' numbers.

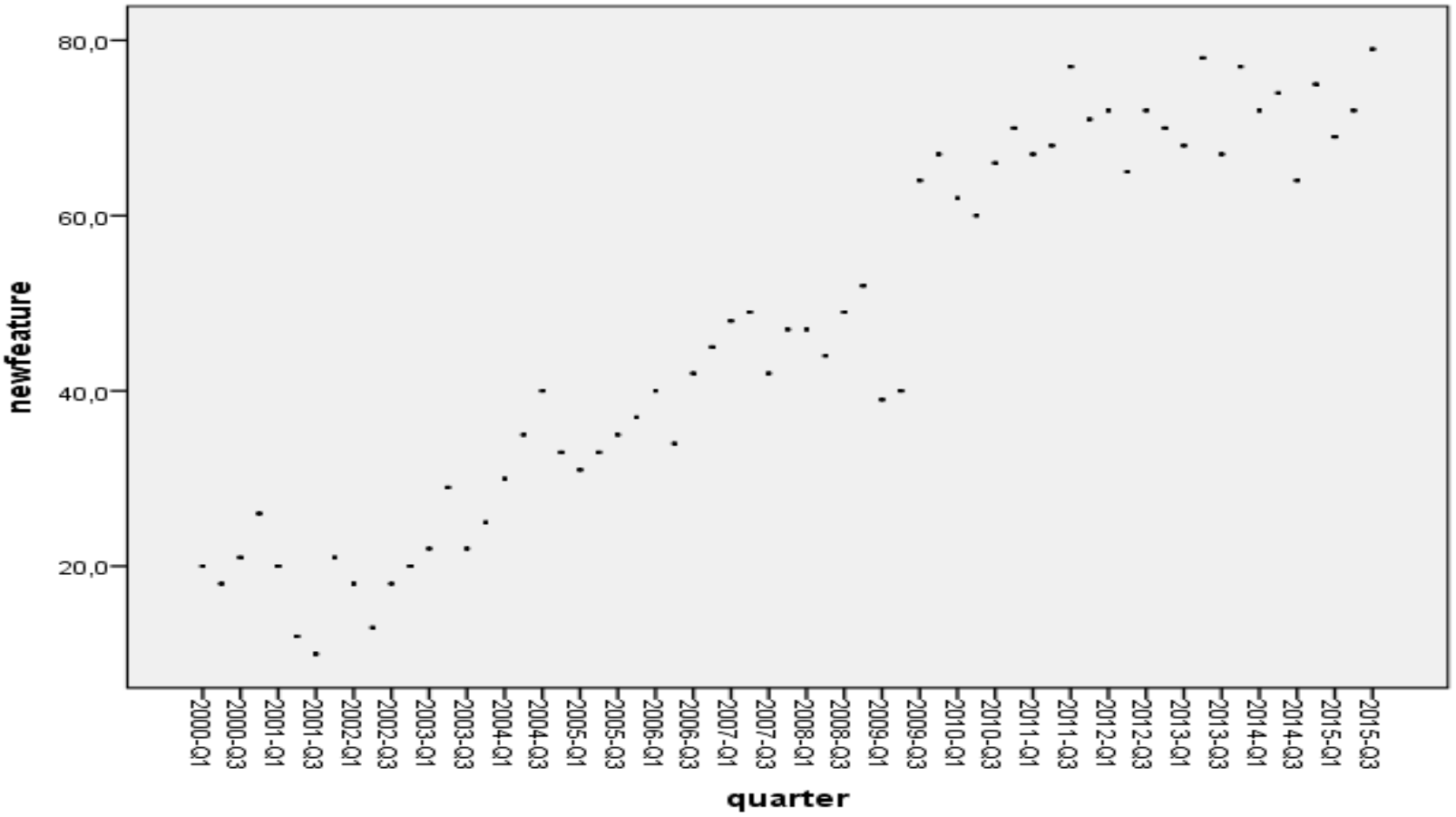
Output 10: Old Purchase Demand PercentageData-Explore Outputs



Customers' numbers who demand old products decreases according to quarter terms.

There is relationship between quarter terms and demanding old products.

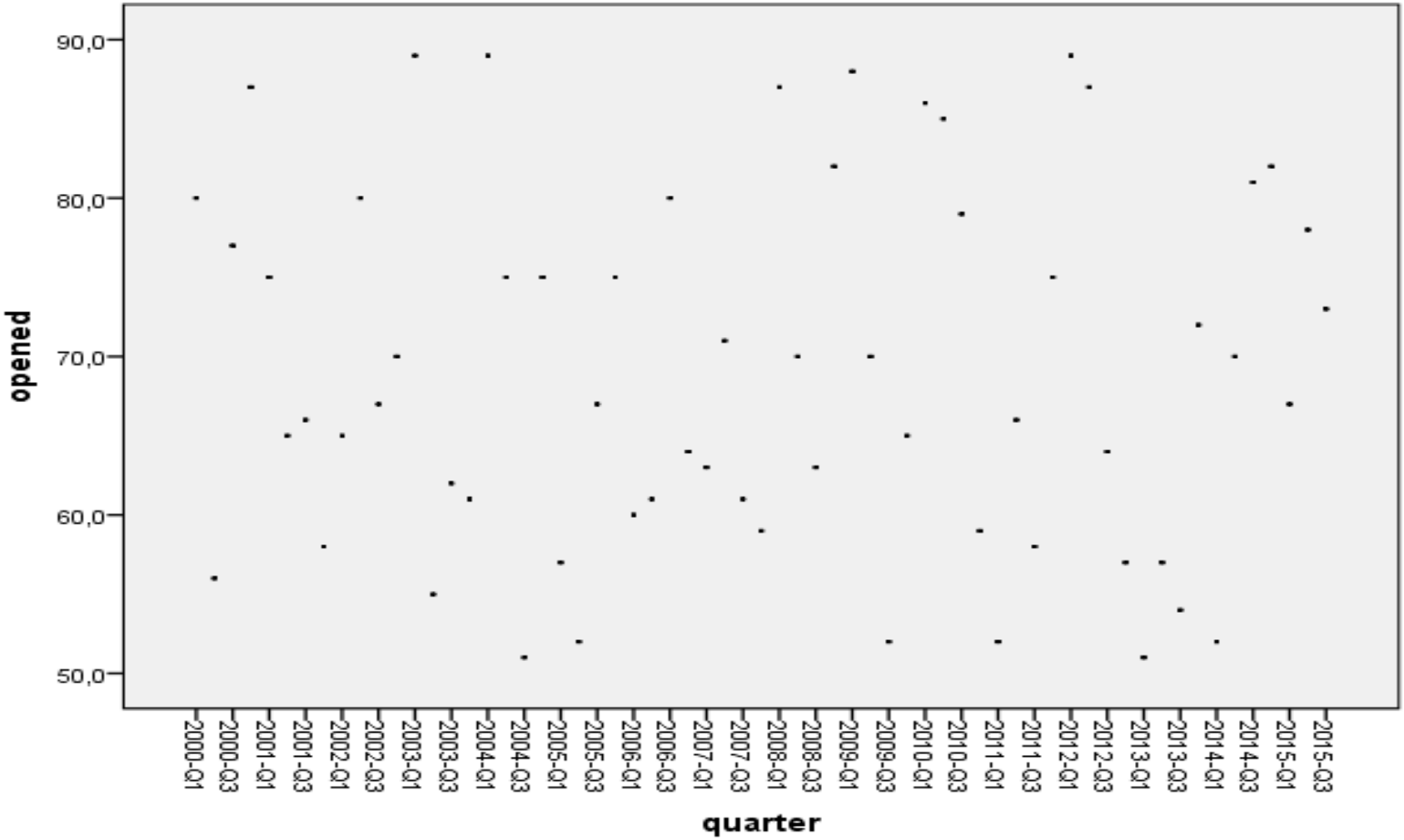
Output 11: New Featured Product Demand PercentageData-Explore Outputs



Customers' numbers who demand new featured products increases according to quarter terms.

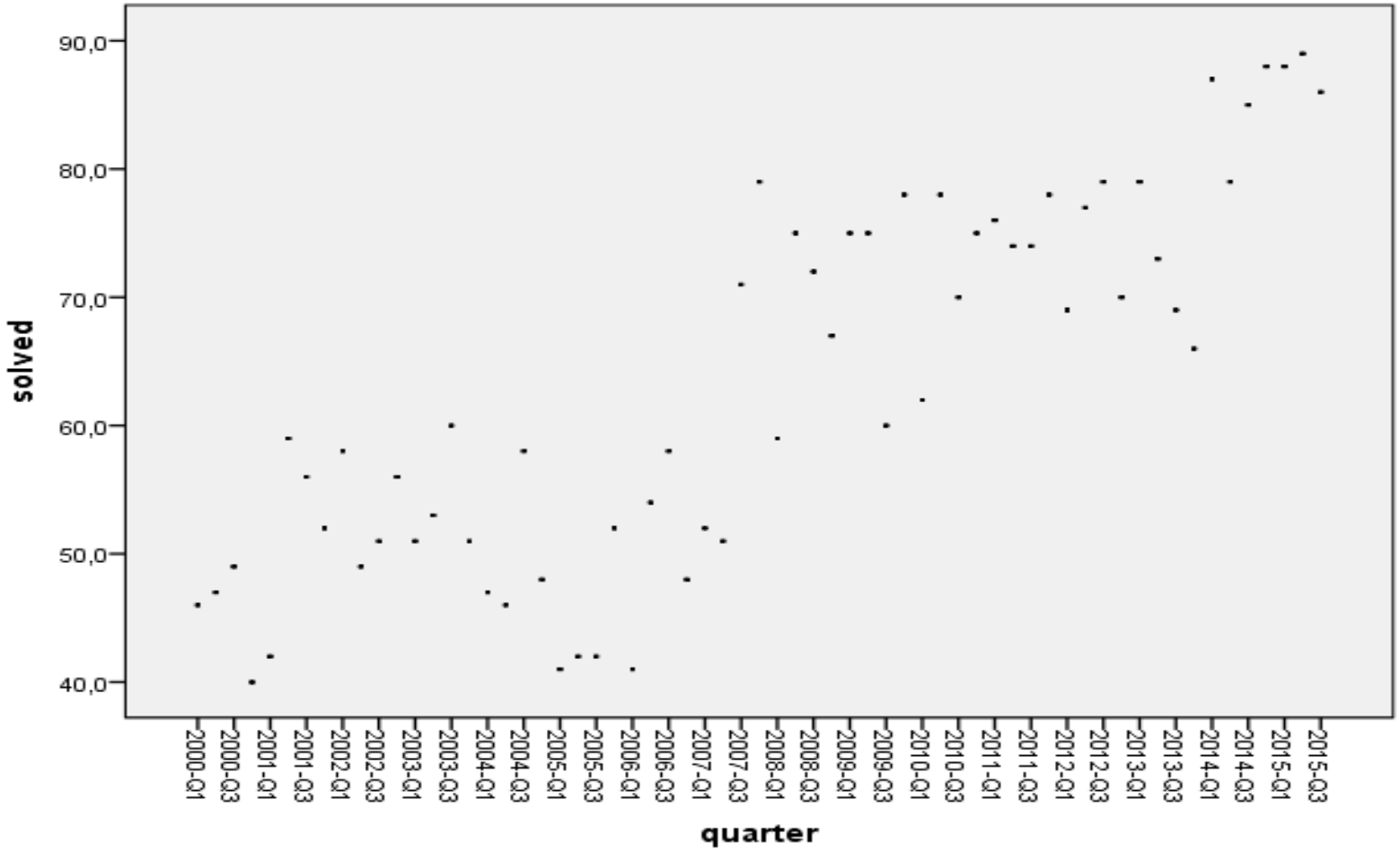
There is relationship between quarter terms and demanding new featured products.

Output 12: Percentage of Issues (opened issues)Data-Explore Outputs



There is no relation between terms and opened problems.

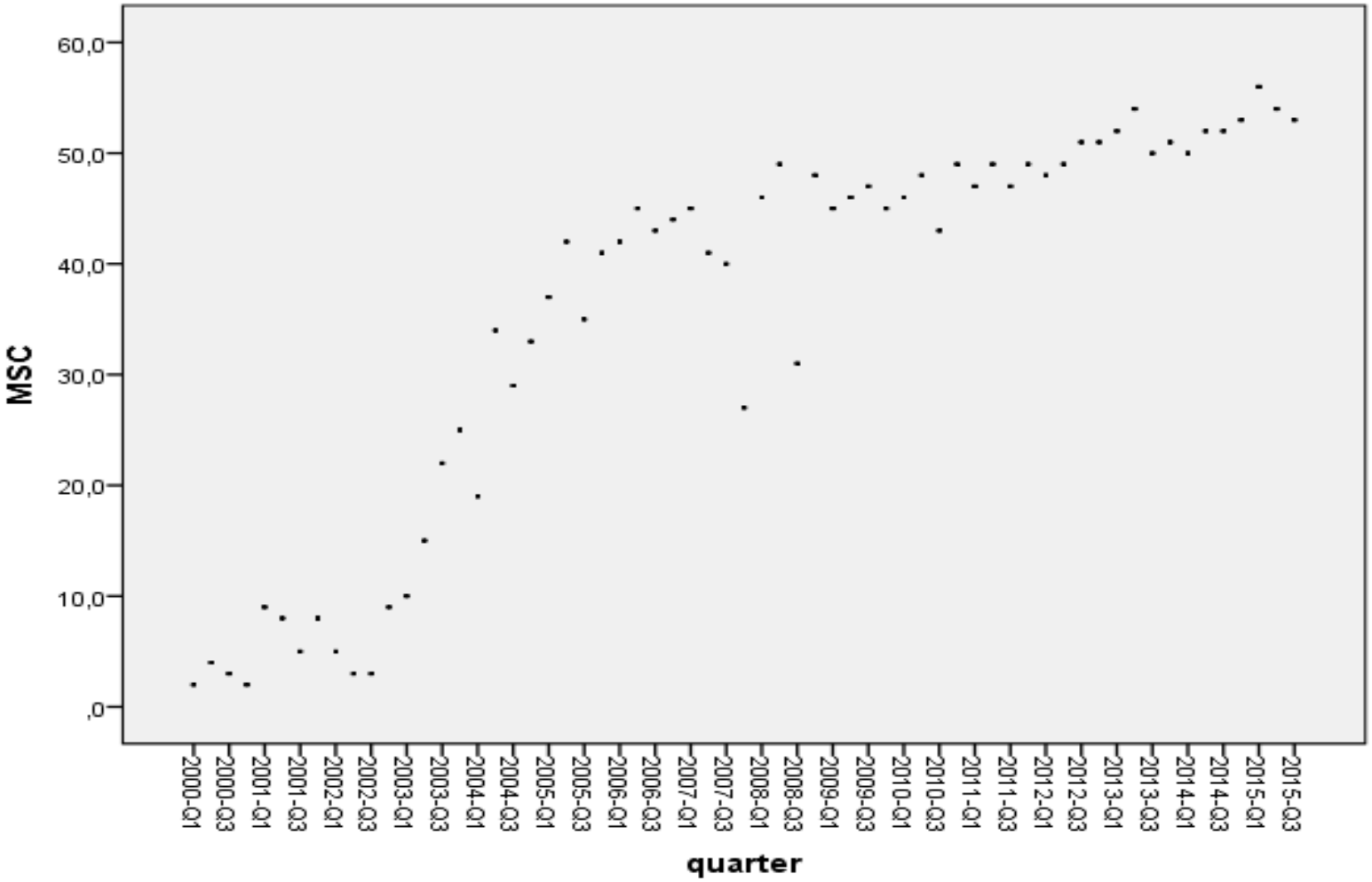
Output 13: Percentage of Solved IssuesData-Explore Outputs



Solved problems numbers increased according to quarter terms.

There is relationship between terms and solved problems.

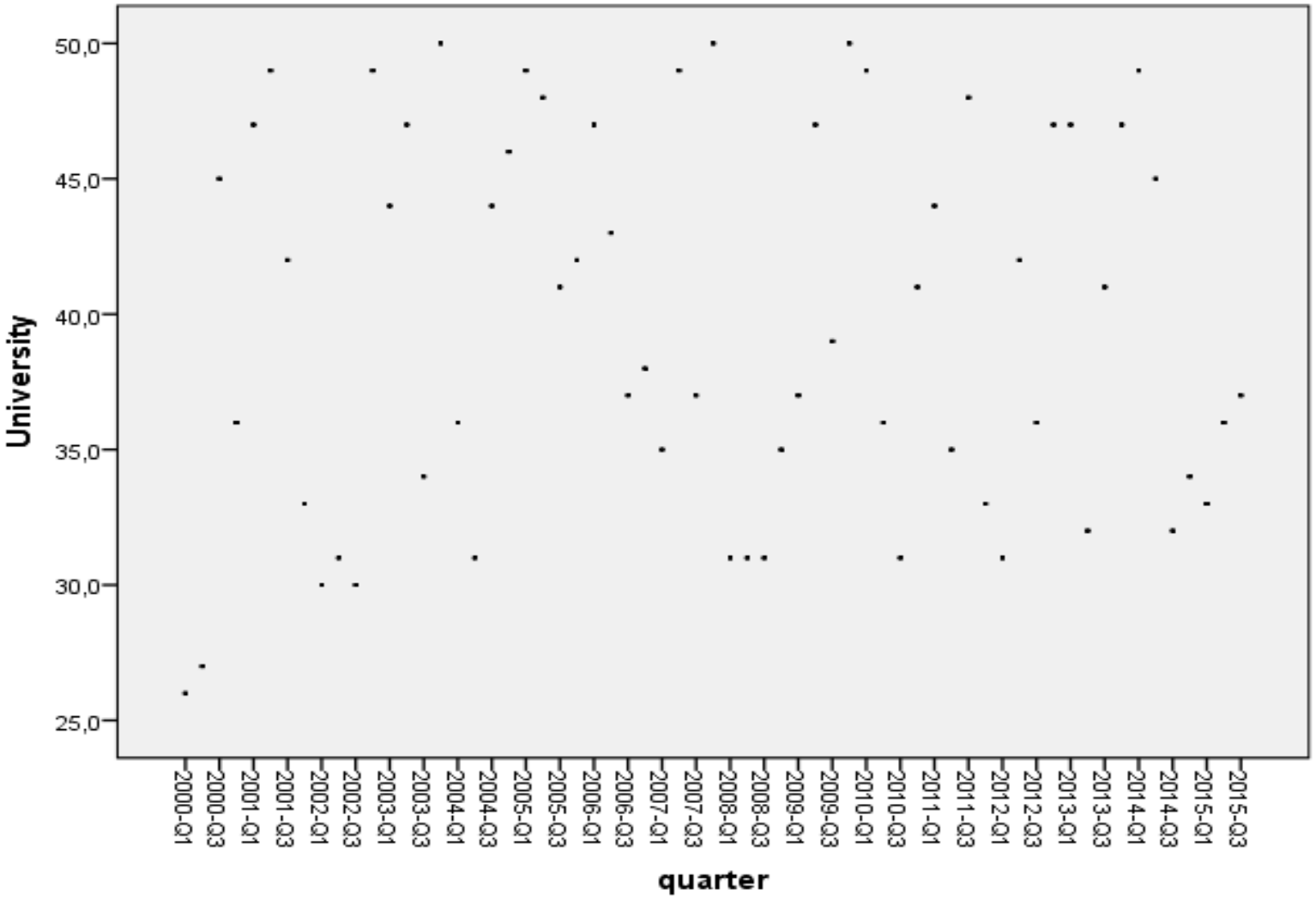
Output 14: Percentage of Master Degree Customers Data-Explore Outputs



Master degree customer numbers increased according to quarter terms.

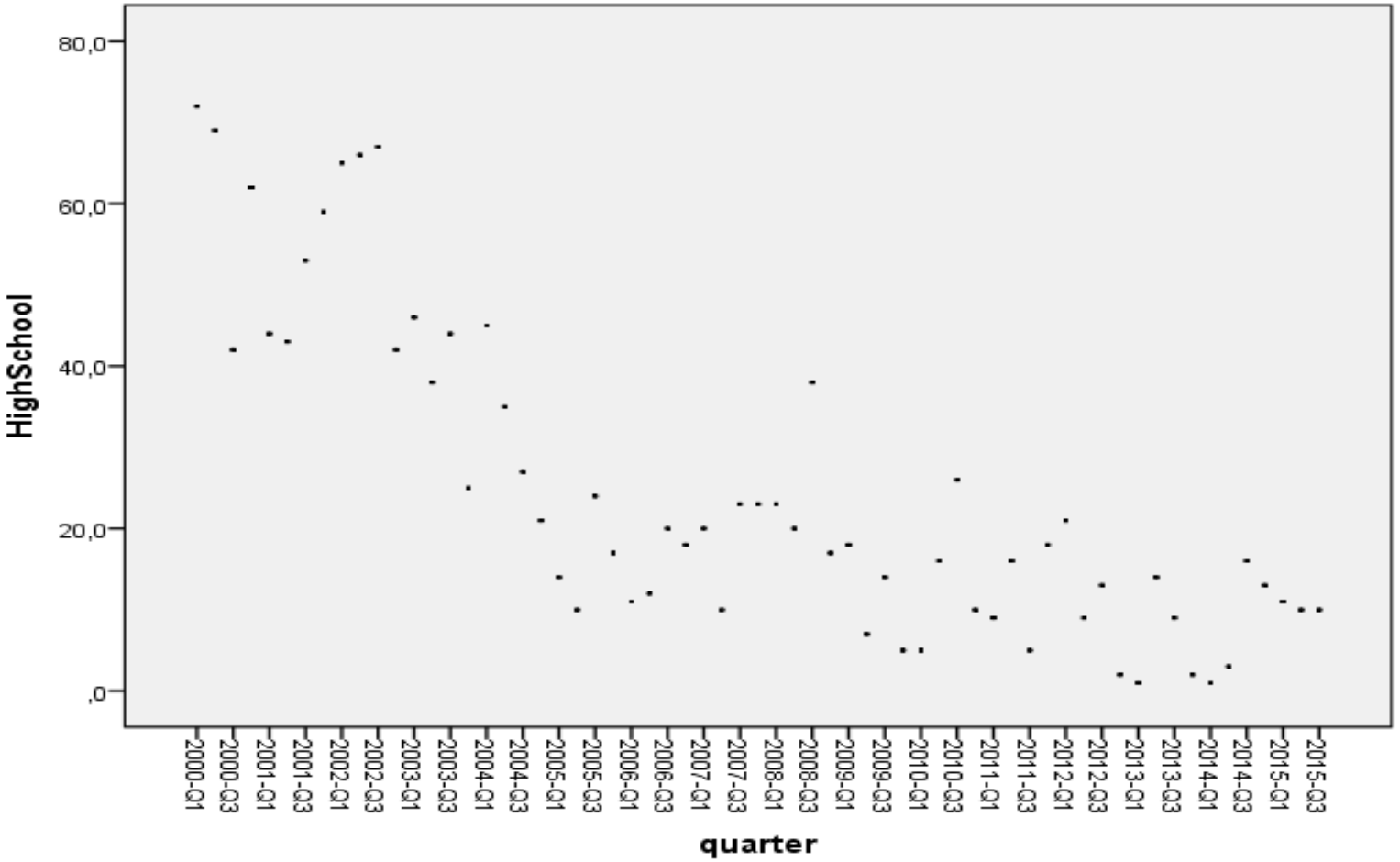
There is relationship between terms and Master degree customer numbers.

Output 15: Percentage of University Degree Customers Data-Explore Outputs



There is no relation between quarters and master university degree customers.

Output 16: Percentage of High School Degree Customers Data-Explore Outputs

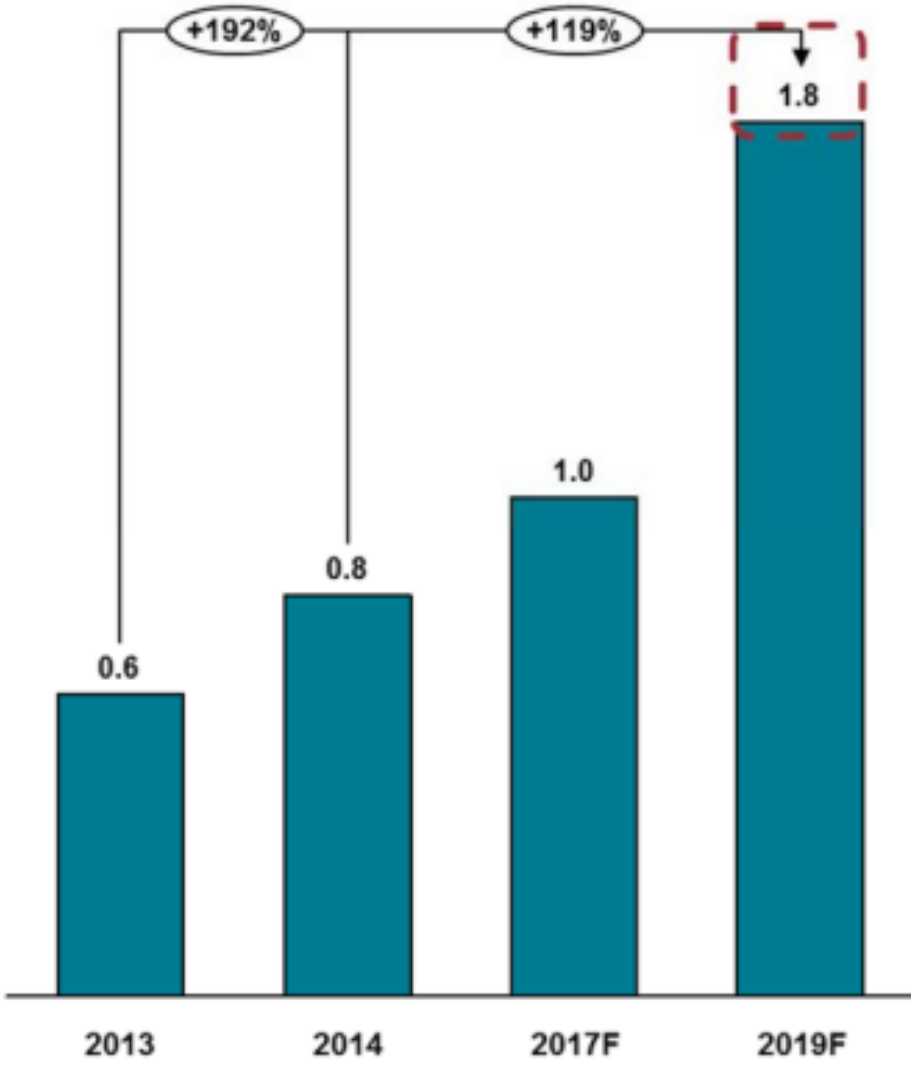


High school degree customer numbers decreased according to quarter terms.

There is relationship between terms and high school degree customer numbers.

As estimation, from KPMG report, mobile and digital banking sectors will increase in a global scale as following Figure:

Figure 53: Estimation of Mobile Banking in a Global Scale[88]



Digital banking sector has been too long developed and too long neglected. As technology integrated in every business model, digital banking became heart of the finance sector. It is clear to see that digital banking, especially mobile banking, plays penetrating role on finance sector positively. There are extremely unlimited factors that affect finance sector but by digitalization, mobile and internet banking has outstanding effects on finance sector.

[88] KPMG Mobile and Digital Banking 2015 Report

It is not totally true to consider only locally because technology is a global scale, life-long processes. In this research, banking sector was analyzed and found out that mobile and internet banking has positive effects on finance sector. Mobile and internet banking contains crucial constituent which is technology.

As a result of this research, technology improvement causes mobile and internet banking usage and helps the business model developed with consist of glamorous features. Thanks to these features, banks have to compete and survive with technology challenge. These challenges extend the branches of finance sector and so make it bigger and add greater value to market segment. In this manner, by positive effects of mobile and internet banking segment, finance sector is being improved.

5. NEW TRENDS PREDICTIONS, RISKS AND SOLUTIONS OF DIGITALISATION

Digitalization is the source of unlimited favors and at the same time formidable perversities. Internet is the biggest space which is uncontrollable and out of the management area. Before the digitalization geography, language, limited information, limited accessibility was the grandest hurdle for communication and interaction of people. By digitalization, global culture is created, and technological revolution was performed.

However, revolution did not end, it is continuous development, improvement life cycle. At 2025, people will be able to access the information and the places only by a small piece of device. If the growth will have the same velocity around today, predicted 8 million living on earth will be totally online which means that people will be more creator than now. It is predicted that the computers will be faster many times more. In addition, VR devices will perform the adjacent to reality, whichpaves the way for making real the virtual/online reality.

It is hard to predict that if it will be safe digital world or dangerous world. The only answer is to wait and see. Google, Facebook, WhatsApp, LinkedIn, etc applications collect the personal and secret data which might be dangerous for livings. Transactions are faster and easier but are they secure?[89]

Everyone will be connected to each other in the future. Argument for future is that what is connected, or being in connection? It is very discrete expletive for livings because meaning of connected bounded by culture, economy, demography, geography, religion, etc. To simplify, it is kind of smart device cheaper than 20 dollars. It is like driving car without driving. In a technical manner, virtual contacts on the base platforms but full accessibility to real life, real events, real information so that physical reality.[90]

[89] Alfred A. Knopf, 2013, New Digital Age, p.5-19
[90] Alfred A. Knopf, 2013, New Digital Age, p.21

However, being in digital connection is an exactly ablude notion. Digital connection is accessibility of the longest place of the sphere, obtaining new users, new developers in a global scale. Digital connection is a guide for future; it will be the crucial for the future technologic improvements especially for countries because of the economic and geographic reasons.

Although digitalization seems as a dream for future predictions, in fact, it is overmuch reality. For example, Minority Report (science fiction film) come out at 2002, includes insubstantial technologies such as motion sensors, touchable screens, monitoring crimes on cordless screens, etc. Now, everything is possible like touchable screens without keyboards, cordless screens like wireless connected smart devices (glasses, phone, monitors, even a wall, window screen etc.). Samsung presented QLED TVs which include perfect Quantumcolors (looks like very clear-real colors), with motion sensors, one single remote controller panel, connected devices nearly invisible and undetectable cable (also Bluetooth, Wi-Fi connections are available) and able to record all programs of all the channels in the list and able to send push notifications to smart devices.[91]

Digitalization and new trends are opportunities to change the world. Education replaced traditional systems with technological systems. Virtual classrooms, distance education are available. But sadly, technology accessibility chance is not standard for livings. Countries and people are not equal and mostly countries cannot see what they have to do to survive in global and economic manner, if they are not proper to access the digital world, visa for technology.

However, if there is no visa for technology, digitalization is the solution of the problem: IVR systems (interactive voice response), which can present the information even without internet connections or smart device requirements.

[91] Alfred A. Knopf, 2013, New Digital Age, p.26

When digitalization segmented by factors, it is mostly called personalizeddigitalization. For example, iPhone (smart phone presented by Apple Inc.) users can personalize their devices easily. IPhone can store and present most visited addresses of the owner and predict where the owner is going to visit next on maps application. Searches done by Safari (it is web browser of MACOS-Apple's own Operating System) developed with the futures of security, speed, privacy, and connected, collaborated with all devices of the owner. IPhone also highlight the memories of the owner, photos include the date, time and location, tagging photos on the albums by phone contacts (even Facebook, Instagram, Google, LinkedIn contacts). Owners can share the location like every smart phones includes these properties, follow their children with map applications, scanning barcodes at the markets, contact with the car while driving, controlling the home with home applications (such as Google Home), settle up the market shopping (Apple Pay, Samsung Pay, Garanti Pay etc.). Whole world segments are still obtained and they never ended while developing the digitalization, living in today's world.

Predictions are mostly baffling when it is called digitalization. According to Alfred A. Knopf, in the future, there will be a smart pill that will be takenjust before the going medical control. This pill will record all transactions performed at living's body. It will be observed by smart devices, in need it will send push notification to inform both of the doctor and the living. Body organs will be able to scans by smart devices, like barcodes, and the smart pill will be able to fix if there is something wrong in the body. This digitalization will lead the personal medical applications by smart devices and doctors will have to adopt digital systems with smart medical devices.

On the other hand, risks are always available and critic. Personal data included in smart devices even DNA analysis, personal habits, every coded formation of the body such as medical problems and normalized actions of the body, eyes, mouth, finger print, habits at home, at social life and at work life, text and social media messages, numbers of contact lists, etc. What are the risks for that situation?

Firstly, data might be stolen and used for crime. In digitalization, it might be hard to find the evidence of the crime. Then it might be detected if a person impended to commit an offence, but it is nearly impossible to block it. On the earth, the knowledge of what is possible to do with digitalization must be demoniacally.

Secondly, for business digitalization is immense risk because of stolen information. For example every monetary processes are tucked away in the information on clouds, digital platforms etc. As attachment digital money is used for global, world-wide transactions (includes shopping, banking transactions, etc.). Security and privacy must be climax protected.[92]

Intercalarily, on every transaction performed by businesses and livings, is under controlled and might be dangerous for future behaviors. For example a comment that written on Facebook 10 years ago might be an evidence for a crime. Freedom of the information and visa for digitalization might be cut. People have to struggle for their rights and visa to use the technology. Risks and opportunities of digitalization are inexhaustible. As a result, countries, companies and people must be wise about digitalization abilities and risks to survive and to have a cushy life in the future.

[92] Alfred A. Knopf, 2013, New Digital Age, p.40-50

6. CONCLUSION

Digital banking sector has been too long developed and too long neglected. As technology integrated in every business model, digital banking became heart of the finance sector. It is clear to see that digital banking, especially mobile banking, plays penetrating role on finance sector positively. There are extremely unlimited factors that affect finance sector but by digitalization, banking models changed and theyhaveoutstandingimpact on finance sector.

It is not totally true to consider only locally because technology is a global scale, life-long processes. In this thesis, banking sector was analyzed and found out that digitalization and new generation technologies have positive effects on finance sector. Mobile and internet banking contains crucial constituent which is technology.

In addition, as a result of this research, technology improvement leads to develop financial services and helps the business model improved with consist of glamorous features. Thanks to these features, companies and countries have to compete and survive with technology challenge.

As an attachment, the thesisdescribes the analysis of the data collected from bank cash flows, balance sheets and money transactions with customer reports from variety of countries. Data analyzed to highlight the importance of the digitalization and new generation technologies effects on finance.

Findings proved that there is strong relationship between digitalization and finance. Developed countries in terms of digitalization and technologies are more profitable and expanded in terms of money and customers. Digitalization and new generation technologies improves countries in terms of channels (distribution, social and personal, production, which are detailed). Financial services are the essential part of the economy which data present the comparison of the countries according to digitalization and financial data.

Countries, businesses, and livings must be integrated to digitalization and new generation technologies to survive and achieve barriers in daily life. Competitive rules and life standards changed and these changes are leaded bydigitalization and the technology.

Accessibility, privacy and security shape the life and habits with business rules. Risks might be dangerous but technology improvement can never be damaged because of the risks, privacy and security issues.

Digitalization cannot be escalated on the earth because it is the connection for social life, business life, and countries to be a real because connections and virtually will present real experiences, to feel what it is real. Finance supports the countries, people for connection and also to survive on the earth. Digitalization and the finance cannot be separated from each other. That's why digitalization has great impact on finance and they will keep making each other stronger, immortal, invincible, and irrevocable.

Countries' technology index differs from each other. It depends on geography, culture, and sectoral development. This thesis highlights the importance of technology index and the variety of channels changed by technology.

However, digitalization and new generation technologies lead to nascence of new trends that will change the future. New trends will be the destruction for standardized life standards and daily routines. According to findings, future will be global in the manner of controlling and accessibility by connections.

On the other hand, new trends must be under the control to inhibit the risks. Management strategies, privacy and security issues are critical for countries. Findings prove that new trends are not able to pretend risks but it will never stop the development of the technology because new trends will bring livings a new life on the new earth with in a very precious new time manner. Every transaction will be online, connected, synchronized to each other and it will be observable in demand.

These challenges extend the branches of finance sector and so make it bigger and add greater value to market segment. Livings' desires and necessities metamorphosed by new trends. New earth will present free accessibility to information. Information on new earth will not be available with only one dimension.

Everything virtual will be real and everything real will be virtual on the connected earth. The thesis findings present possible digitalization effects on finance.In this manner, by positive effects of digitalization and new generation technologies, finance sector is being improved.

7. REFERENCES

Accenture, Exploring Next Generation Financial Services , 16-1807, Global Financial Data, Institute of Financial Service Providers, 2016

Accenture, Make Your Digital Connection:From Digital Strategy to Airline Strategy, by UK Trade & Investment © Crown Copyright UKTI/13/1372, June 2014

Accenture Report, World Economic Forum White Paper Digital Transformation of Industries: In collaboration with Accenture, 2016

Alfred A. Knopf, New Digital Age, ISBN: 978-605-5090-42-2, Google INC, Jared Cohen, 2013

AT Kearney , "Banking in a digital world", Digital Banking Journal, Annual Report 2013

Avison, D. and Fitzgerald, G., Information Systems Development: Methodologies, Techniques and Tools, 3rd edition, McGraw-Hill, Maidenhead, 2002

Bloomberg, "Fintech&Regtech", Technology Unit- August, 2016

Booz & Company (PWC), Global Perspective, August, 2012

Christine Duhaime, American Banker- Digital Finance Institute(Category of: AI, Articles by Institute, Artificial Intelligence, FinTech, LawTech), 2016, October 12

Coelho, F. and Easingwood, C, "Multiple Channel Structures in Financial Services: a Framework", Journal of Financial Services Marketing, Vol. 8 No. 1, 2003

Dale Benton, How Can Business DigitisationDrive the Transport Industry, Supply Chain Digital Newsletter, 2016

Deloitte, "Banking Disrupted, How Technology is Threatening the European Retail Banking Model", 2014

Deloitte, There's no place like phone: Consumer usage patterns in the era of peak smartphone Global Mobile Consumer Survey 2016: UK-Cut Vol.8

Economist, DIGITAL FINANCE: Meeting ethics and compliance challenges in financial services, LONDON, 20 Cabot Square London, E14 4QW, United Kingdom, 2016

Eric Griffith, “The Internet of Things Lets You Automate YourHome and Monitor It From Afar: Ready to Dive In?”,PCMag MAY UK., 2017

EY, “The digitisation of everything-How organisations must adapt to changing consumer behaviour”, Ernst & Young LLP, 1 More London Place, London, SE1 2AF.©, Ernst & Young LLP 2011. Published in the UK., 2016

GPFI (Global Partnership for Financial Inclusion),G20 High-Level Principles for Digital Financial Inclusion, China, 2016

Jack M. Balkin, The Future of Free Expression in a Digital Age, Pepperdine Law Review, Vol. 36, 2009

Jared Cohen, Eric SchmidtThe New Digital Age: Reshaping the Future of People, Nations and Business, ISBN: 9781848546226,John Murray, 2014

JariKupiainen, Translocalisation over the Net: digitalisation, information technology and local cultures in Melanesia, E-learning and Digital Media, Vol3, 2006

Jonsson, S. and Gunnarsson, C, 2005, “Internet Technology to Achieve Supply ChainPerformance”, Business Process Management Journal, Vol. 11 No. 4

John Giusti, Chief Regulatory Officer, GSMA, World Economic Forum January, 2016s

John Sciacca, SmartenupyourDumbHousewith Z-WAVE Automation,2014, Published by Digital Trends(digitaltrends.com)

John D. V., Darrel M. W., andRobin J. L., the 2016 BrookingsFinancialandDigitalInclusionProject Report: Advancing Equitable Financial Ecosystems, 2016, Washington DC.

Khawaja Saeed,“Understanding the Adoption of Mobile Banking Services: An Empirical Assessment”, 2011

KPMG, Mobile and Digital Banking, Yearly Report, 2015

Lisa Welchman, Managing Chaos: Digital Governance by Design, 2016

McKinsey, Imagining Construction’s Digital Future, Editors: Rajat Agarwal, Shankar Chandrasekaran, and Mukund Sridhar,June 2016

Megan Durisini, “Here's Why Online Banks Are Better Than Traditional Banks”, Business Insider Journal, 2013

MIT Center for Digital Business and Capgemini Consulting, Digital Transformation: A RoadmapforBillion-DollarOrganisation, 2011

Nhat Nguyen, Potential of Developing and Using Mobile Banking Apps in Vietnam, 2014

Pilat, D., “Regulation and Performance in the Distribution Sector”, OECD Economics Department Working Papers, No. 180, OECD Publishing, Paris, 1997

Project Tomorrow, The New Digital Learning Playbook: Understanding the Spectrum of Students’ Activities and Aspirations, Speak Up, 15707 Rockfield Boulevard, Suite 250 | Irvine, CA 92618, 2014

Ray Kurzweil, The Age of Spiritual Machines: When Computers Exceed Human Intelligence, 1999-32

Richard Straub, Advances in Digital Education and Lifelong Learning, ISSN: 2051-2295, Publisher: Kimberley Chadwick, 2017

Roy Freedman, Introduction to Financial Technology, eBook ISBN: 9780080461847Hardcover ISBN: 9780123704788, 2006

Sean Williams, “Banking in a Digital World”, Digital Banking Journal, 2013 AT Kearney, 2015

Scott Brennen & Daniel Kreiss, Digitalisation and Digitization, International Encyclopedia of Communication Theory and Philosophy, 2014

Stacy Wiedman, Building a Digital Governance Program, ISACA Geek Week p.16 August 8 vol,10, 2016

Temenos- Microsoft “Enable Application Innovation: Customer Solution Case Study”, Yearly Report2014

Temenos - Microsoft“Customer Success in The Digital Age”, Annual Report2014

TommiLaukkanen,“Internet vs mobile banking: Comparing Customer Value Perceptions”, Business Process Management Journal · DOI: 10.1108/14637150710834550, November 2007

T. Sreenivas, Banking Sector and Human Resources, Changing Scenario, Discovery Publishing House, 2006

UK Trade & Investment, Beyond e-Commerce to Everywhere-Commerce, Yearly Report 2014

UK Trade & Investment, Great Commerce, Yearly Report 2014

UK Trade & Investment, Annual Commerce Report, Yearly Report 2014

Voith, Digitalisation and New Generation Technologies, Yearly Report 2016

Waleed Al-Ghaith, Louis Sanzogni, Kuldeep Sandhu, “Factors Influencing the adaptation and Usage of Online Services in Saudi Arabia”, The Electronic Journal on Information Systems in Developing Countries, 2010