

A comparative Study of Japan and the ROK on ICT and Economic Development: Lessons for Turkey

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Abstract:

This study begins with the historical telecommunication backgrounds of Japan, ROK, and Turkey. These countries have similarities in the development of telecommunication sector throughout history including the privatization of the sector. However, a major dissimilarity appeared from use of the technologies and producing new technologies by the worldwide companies. The developments in ICT have strong relations with the socio-economic development of these countries. For this reason, this study focuses on; (i) economic development indicators, (ii) ICT indicators, and (iii) Principle Component Analyses. With the findings, it is aimed to find out applicable policies for Turkey. Finally, it is clearly observed that Turkey has great potential in the near future as a rapid developing country and a growing ICT market for foreign market players. However, Turkey also needs to create her own powerful and effective worldwide companies.

Key words: ICT, Development, telecommunication, innovation, PCA, Japan, ROK, and Turkey.

1. Introduction

The necessity of this study arose from my previous studies on ICT and economic development that indicated two important findings; regional GDP per capita convergence in the major East Asian countries (Okur Dincsoy, M., 2008) and the effect of ICT developments over regional GDP per capita convergence (Okur Dincsoy, M., 2009). The aim of this paper is to consider the relationships of economic development and ICT from a more specific aspect focusing on three countries, Japan, the Republic of Korea (ROK) and Turkey; including their ICT market conditions by segments and their companies in ICT operations.

Japan is one of the most developed countries in the world today. The ROK also accomplished rapid economic growth, following Japan. Both are known as counties that achieved successful outcomes in ICT industries, too. Many of their companies, Samsung Electronics and LG Electronics of the ROK, Sony, Toshiba, Panasonic and Hitachi of Japan, go world markets and carry on their business aggressively.

Turkey, my home country, also started the economic development. However, her economic

strength is far behind Japan and the ROK at the moment. Turkey has few enterprises that can compete on an international scale.

Then, how can Turkey continue to grow in this harsh international economic environment? Can Turkish companies convert themselves to massive international corporations? And in so doing, what kind of lessons can Turkey learn from the experiences of Japan and the ROK.

2. Historical Telecommunication Backgrounds

The telecommunication sector in Turkey has a long history including before and after the republic period. He installed the telegraph line in 1847 and became one of the founding members of the predecessor organization of the ITU in 1865. He also established the first automatic telephone exchange between the Balkans and Ankara in 1926. Turk Telekom was established by being separated from the General Directorate of Post, Telegraph and Telephone. In recent years Oger Telecom purchased 55 % of Turk Telekom shares. Also, related policies with telecommunication and issuing licenses are operated by the Ministry of Transport (ITU, 2002).

The Turkish mobile market is one of the biggest and most attractive in the region because of two reasons; (i) high population and (ii) the high percentage of young generation in it. The market is basically shaped by three GSM operators and foreign investors. They play an important role in the market by taking remarkable stakes of operators. Turk Telekom began the analogue Nordic Mobile Telephone (NMT) network after 1986, and two digital GSM operators (Turkcell and Telsim) started the services in 1994. However, the transition to 3G in mobile technology was relatively late compared to some other countries in Europe that the necessary licenses agreements could be issued after 2007 with the operators.

In Japan, a Ministry of Communications was established in 1890 and remained in place until the end of the Second World War. The Ministry of Telecommunications became a public corporation and Nippon Telegraph and Telephone (NTT) was born in 1952. It was to be the monopoly domestic operator. At the same time, the Ministry of Posts was changed as the Ministry of Posts and Telecommunications (MPT), which was responsible for the regulation of the telecommunication market (OECD, 1999). In the same year, Kokusai Denshin Denwa (KDD) was established as the international operator. NTT was the primary regulator, responsible for the setting of technical standards, the development of telecommunication regulation, and for policy-making in conjunction with the Japanese parliament. NTT controlled an R&D system in collaboration with the large equipment manufacturers, such as Sony, Fujitsu, NEC, Hitachi and Oki Electric.

A significant reform in telecommunications occurred in the 1980s. The United States began liberalizing its telecommunications market and started the process leading to the break-up of AT&T (American Telephone and Telegraph). In Japan, the Second Provisional Council on Administrative Reform (Rincho) announced in 1982 to introduce competition in all sectors of telecommunication services, as well as to privatize and reorganize NTT. The approval was focused on separating the telecommunication services on the basis of installation of circuit-switched facilities (ITU, 2005). However, these reforms related with NTT were not applied until 1985 and the government still holds a substantial share in NTT.

Japanese telecommunications sector is one of the most active markets in the world due to being the leading country in the technology use. Its mobile market entered a growing phase with the 2G mobile telephone. NTT DoCoMo offered the world's first 3G mobile phone service before 2002. Some other market players also appeared as au and Softbank (Lallana, C.E., 2004 and Hedrix, P. 2005a). The 3G market in Japan is still attracting other players that two additional licenses were issued in 2005. The market has, however, already planned the new restructuring period for 4G, while Turkey is currently having benefits from the 3G mobile technology.

In ROK, the telecommunication history began in 1885. The first telephones were established in 1902 and the first automatic exchange introduced in 1935. ROK joined the International Telecommunication Union in 1952. By the end of the 1980s, ROK had achieved a high level of universal service (OECD, 2000a). ROK also signed the World Trade Organization (WTO) agreement on basic telecommunication services that became effective in November 1997, committing the country to liberalization of its telecommunication sector. The nation's historical operator is Korea Telecom Corporation (KT). It began as the government-owned Korea Telecom Authority in January 1982. Its statute was changed in 1989 allowing it to be privatized in 1993; the government began selling its shares in the company. Ten additional share sales ensued over the next decade with the final one in May 2002 when the government fully divested itself of the company. ROK progressively liberalized its telecommunication sector during the 1990s (OECD, 2000b). The first market segment opened was international long distance with the entry of Dacom in December 1991. Onse Telecom entered the market in 1997. National long distance services were opened to competition in January 1996 when Dacom extended its services to this sector of the market. Finally, local telephone services were opened in April 1999 with the entry of Hanaro. It had a major impact on ROK's broadband development (KIEP, 2002). The Ministry of Information and Communications (MIC) is responsible for telecommunication and broadcasting policy and regulation.

Telecommunication market in ROK is as open as any in the Asia-Pacific region. Market entry is contingent upon government approval but essentially depends on the nature of the service provider (KIEP, 1998). Most companies would have little incentive for entering infrastructure-based segments because of three reasons: (i) the market is already well served with high penetration levels, (ii) revenues and profits are declining for traditional circuit-switched voice services, and (iii) it is inadvertently transitioning to a next generation network whose eventual structure is uncertain (KIEP, 2003). The mobile market is mainly shaped by three major mobile phone operators: SK Telecom, KTF, and LG Telecom. Also, Samsung Electronics and LG Electronics are leading the market in mobile phone production. The 3G technology in Korean market commercially appeared in 2003. The service could not initially attract a large number of users by 2007. However, High-Speed Downlink Packet Access (HSDPA) platform made it more attractive and the 3G market resulted in a real increase. Currently, ROK is considered as a leader country in 3G mobile technology with its highest percentage of mobile users in the world.

Finally, Japan, ROK, and Turkey have many similar developments in telecommunication sector throughout the history. Besides, current developments in mobile technologies and related markets are giving further business and investment opportunity for them. However, there are also dissimilarities of Japan and ROK with Turkey, especially in the use of the technologies and the creation new technologies by the worldwide companies.

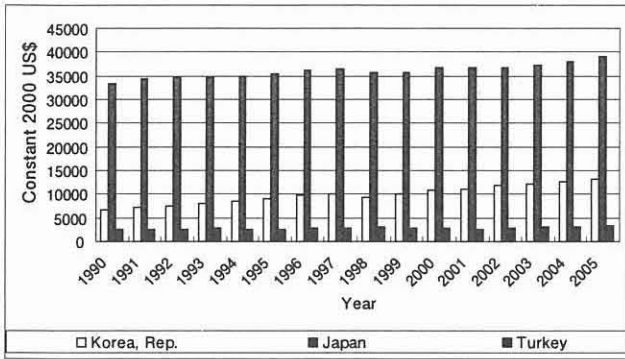
3. Economic Development Indicators

In this section, I will focus on a few key indicators of the economies related with ICT that is, GDP per capita and outflows and inflows of FDI.

Japan has an economy very powerful in the global markets and has strong assistance of government on the industrial sectors that can be extended over the telecommunication. Even though the industry is heavily dependent on imported raw materials and fuels, Japan succeeded an unusual sectoral momentum resulting in a rank of second most technologically-powerful and third-largest economy in the world (Hedrix, P. 2005b). ROK is the country that caught up the western countries in terms of technology, innovation and knowledge based industries resulting in one of the fastest growing economies in the world. As Japan, ROK reached its development level with the assistance of government on business. With an important delay, Turkey has used a similar methodology for its development. Turkey applied effective governmental policies on liberalization movement between 1983 and 1990, and increased the governmental assistance on business after 2000s.

When we compare the GDP per capita levels of the countries (Figure 1), it is clearly seen that how big the Japanese economy is. GDP per capita of the Japanese economy is bigger than the sum of two countries GDP per capita.

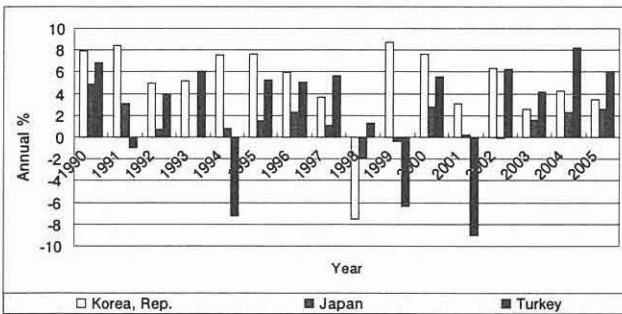
Figure 1. GDP per capita (constant 2000 US\$)



Source: WDI (2007)

However, after 2002 Turkish economy is growing faster than Japan and ROK (Figure 2). From 2000 to 2003, government efforts of Japan to recover the economic growth had a little success; and Japan's huge government debt and the aging of the population are remaining as two major long-run problems (ITU, 2004). An outward-oriented economic development strategy, which used exports as the engine of growth, contributed a great economic transformation to ROK by implementing many successful development programs which provided GDP per capita increases (Hedrix, P. 2005c). However, it falls far short of development of Turkey after 2001 economic crisis (ETF, 2009).

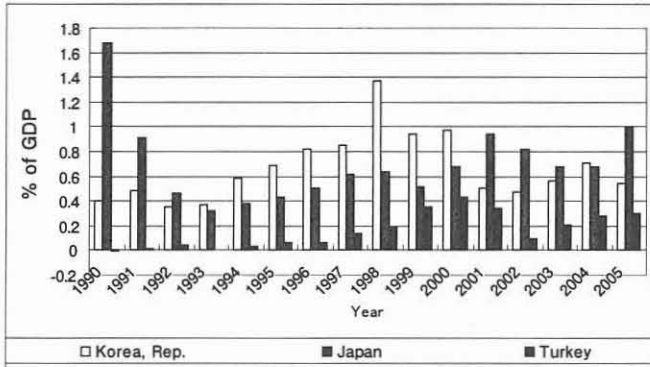
Figure 2. GDP per capita growth (annual %)



Source: WDI (2007)

In comparison of FDI (Foreign Direct Investment); Japan, ROK, and Turkey take the highest FDI net outflows in 1990, 1998, and 2000 respectively (Figure 3).

Figure 3. Foreign direct investment, net outflows (% of GDP)

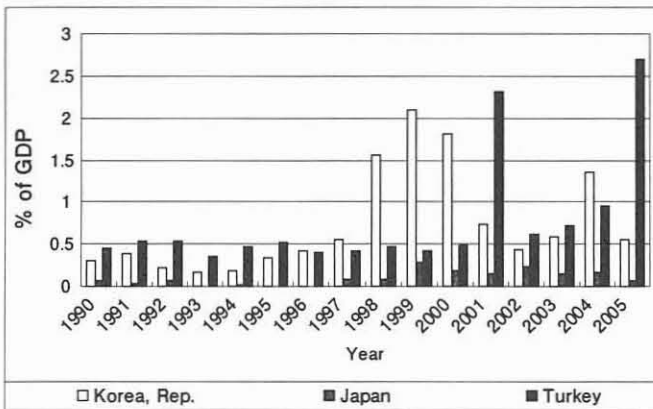


Source: WDI (2007)

The FDI net inflow to Turkey obtains the most significant percentage of GDP in 2005 (Figure 4). The share of FDI in GDP of Turkey was relatively higher than Japan and ROK in 2005.

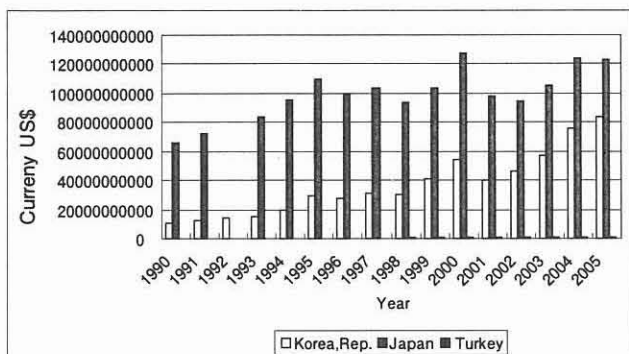
According to high-technology exports (current US\$), Japan takes its highest value in 2000 and ROK in 2004. ROK also shows more stable growth than Japan. Turkey has no significant value compared to Japan and ROK (Figure 5). Turkish economy cannot still produce high-technologies and has no active player in the global markets based on innovation which has closely linked with ICT components. For instance, Samsung Electronics and LG Electronics in ROK and Sony, Toshiba, Hitachi, Casio and etc., in Japan are worldwide active players in mobile phone including other ICT related technologies; and partially Turkish companies such as Beko Electronics and Arcelik Electronics in Europe and Africa markets.

Figure 4. Foreign direct investment, net inflows (% of GDP)



Source: WDI (2007)

Figure 5. High-technology exports (current US\$)



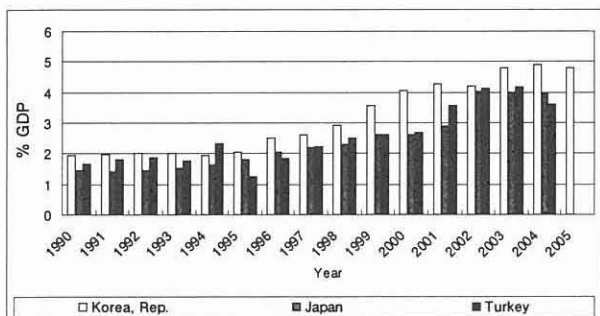
Source: WDI (2007)

4. ICT Indicators

In this part of the study, I analyze the ICT indicators of the economies. As these three economies have different development levels and classifications as developed and developing countries, their shares in GDP or revenues is important in comparison and understanding of these economies.

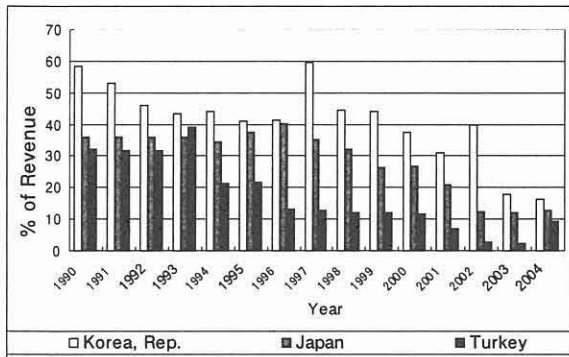
Figure 6 shows the percentages of telecommunication revenue in GDP. ROK is taking the highest share in all years except in 1994. Also, there is a significant percentage increase in all countries compared to beginning year, 1990. If I compare three countries according to the percentages of investment of revenue, ROK is again in the leader position in all years (Figure 7). These percentages decreased since 1997 in Japan and ROK. However, there is an increase in Turkey in 2004.

Figure 6. Telecommunications revenue (% GDP)



Source: WDI (2007)

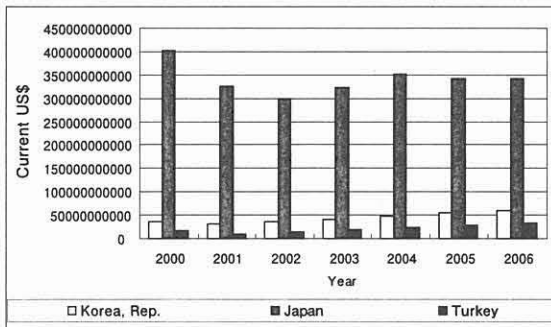
Figure 7. Telecommunications investment (% of revenue)



Source: WDI (2007)

In ICT expenditures (current US\$), Japan is above board depending on its huge amount of GDP level (Figure 8).

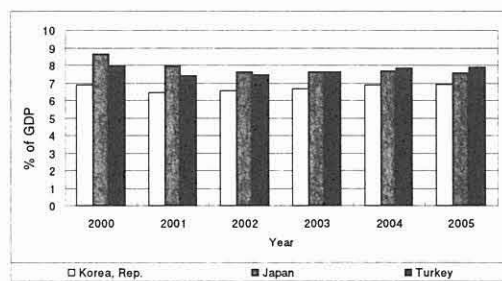
Figure 8. ICT Expenditures (Current US\$)



Source: WDI (2007)

However her share of ICT expenditure in the GDP is not high. In the recent years, Turkey has overreached Japan and ROK in this index (Figure 9). This situation predicates the heightened national interest in Turkey on ICT because her size of GDP is distinctly lower than Japan and ROK.

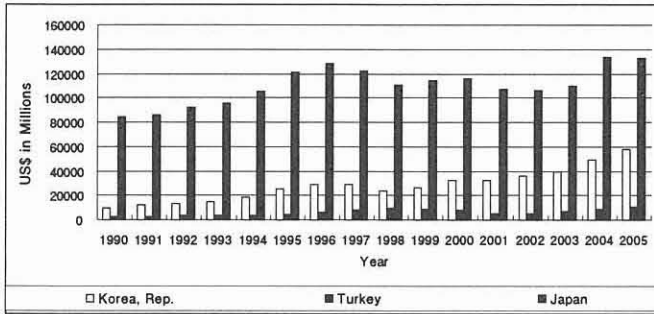
Figure 9. ICT Expenditure (% of GDP)



Source: WDI (2007)

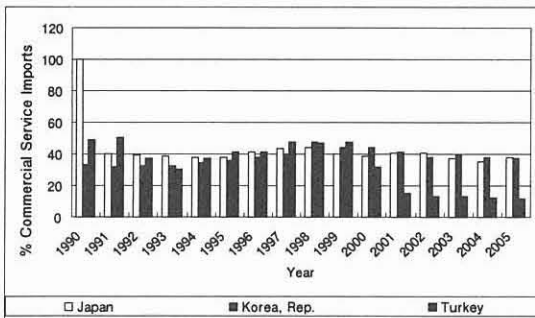
Figure 10 points out the commercial service imports (current US\$ in millions) that there have only been a stable increase in ROK. In % of commercial service imports there have been no notable change in Turkey in recent years (Figure 11). In the same years, Japan and ROK have obtained an increasing trend.

Figure 10. Commercial service imports (current US\$ in millions)



Source: WDI (2007)

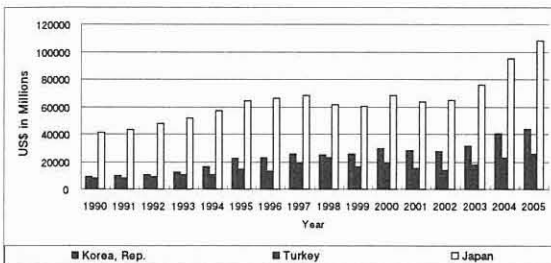
Figure 11. Computer, communications and other services (% of commercial service imports)



Source: WDI (2007)

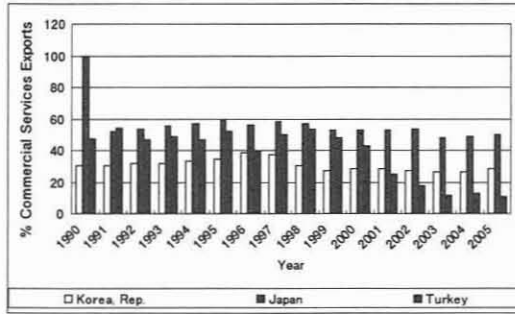
Figure 12 is given for the commercial service exports (current US\$ in millions) that there have been a growth trend in the countries, especially in Japan. In % of commercial service exports there have been significant decreases in Turkey in recent years (Figure 13) compared to Japan and ROK.

Figure 12. Commercial service exports (current US\$ in millions)



Source: WDI (2007)

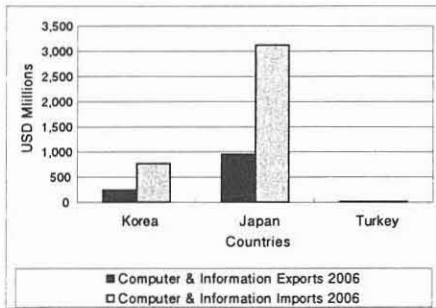
Figure 13. Computer, communications and other services (% of commercial service exports)



Source: WDI (2007)

Figure 14 also shows the long distance Turkey need to cover; especially in the computer and information service trade in both export and import for 2006, Turkey couldn't take any visible value.

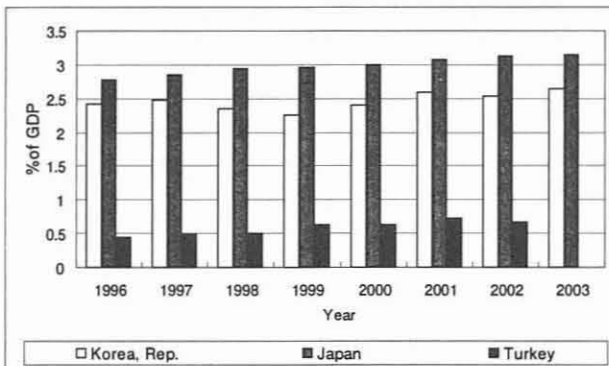
Fig 14. Computer and Information services trade, 2006 USD millions



Source: WDI (2007)

As to R&D expenditures in GDP (Figure 15), the highest amount naturally appeared in Japan. If we reconsider GDP level of Japan, then it is clearly seen that Japan spare capital and funds.

Figure 15. Research and development expenditure (% of GDP)

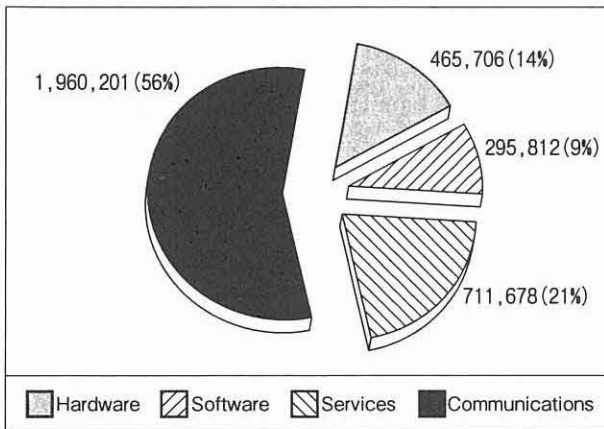


Source: WDI (2007)

5. ICT Spending by Markets and Company Profile Analyses

Figures 16-20 show respectively ICT spending by market segments in 2007 (US\$ in millions) and emphasizes the potential of market player for the economies of countries. The total spending on ICT in the world is worth of US \$3433397 millions (Figure 16). According to the segments, Communication market is taking the highest amount with US\$1960201 millions (56% of total). This market is giving a better opportunity for market players (companies) than other market segments, which are hardware (14%), software (9%), and services (21%).

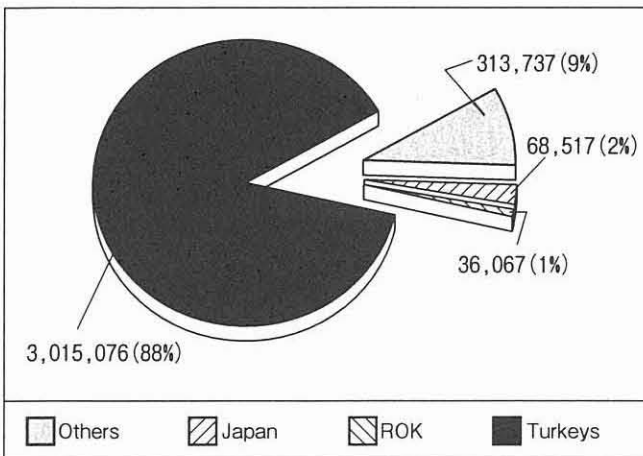
Figure 16. ICT spending by market segment in the World, 2007 US\$ millions, current prices



Source: OECD (2007)

In Figure 17, the shares of Japan, ROK and Turkey are given to show the position of these countries in the World. As expected, Japan has significantly higher percentage in ICT spending with 9% depending on the size of her economy compared to ROK (2%) and Turkey (1%).

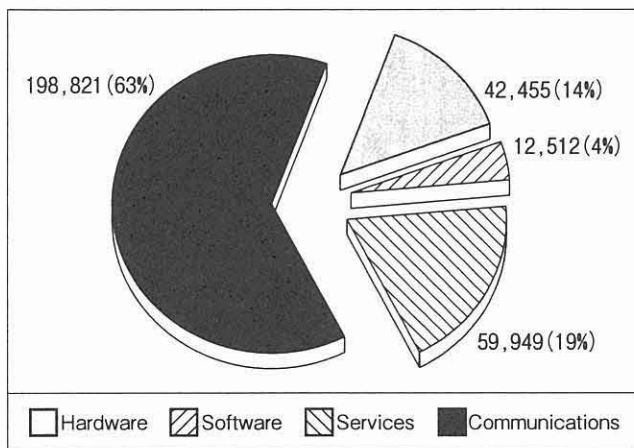
Figure 17. Share of Japan, ROK, and Turkey in ICT spending, 2007 US\$ millions, current prices



Source: OECD (2007)

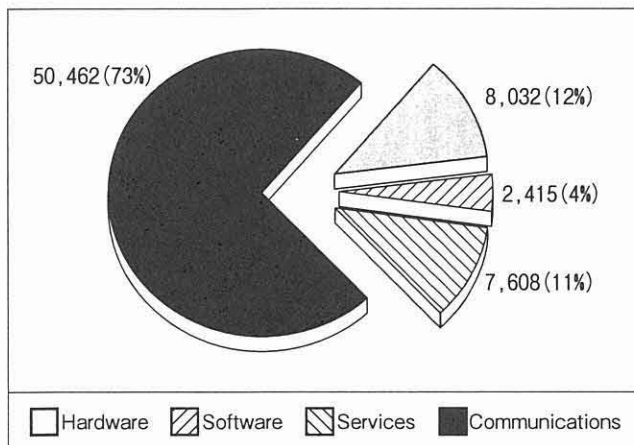
In Figures 18, 19, and 20, ICT spending by market segments is given for Japan, ROK, and Turkey. The communication market is distinguishingly occupying in a higher percentage in total ICT spending with 73% in ROK compared to Japan (63%) and Turkey (63%). The service market is taking highest percentage in Japan with 19% compared to ROK (11%) and Turkey (12%). The software and hardware spending is taking highest percentage in Turkey with (11 % and 18 %) compared to Japan (4% and 14%) and ROK (4% and 12%), respectively. Finally, it is observed that these countries have different national tendencies in ICT spending due to needs and costs.

Figure 18. ICT spending by market segment in Japan, 2007 US\$ millions, current prices



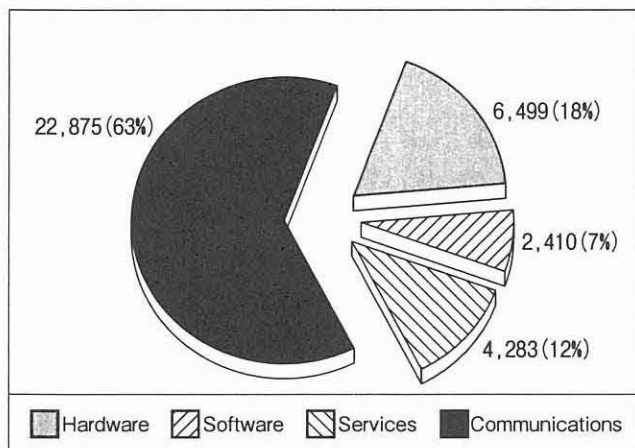
Source: OECD (2007)

Figure 19. ICT spending by market segment in ROK, 2007 US\$ millions, current prices



Source: OECD (2007)

Figure 20. ICT spending by market segment in Turkey, 2007 US\$ millions, current prices



Source: OECD (2007)

As the methodology, I used Principal Component Analysis (PCA) as a mathematical procedure and a useful statistical technique by utilizing the data of top 100 companies in ICT operations according to the countries in the World (BusinessWeek, 2009)¹. The data is consisting of five indicators, which are Revenue Growth (%), Return on Equity (%), Shareholder's Return (%), Revenue (in millions), and Profits. Then, I calculated the standard deviation, covariance, eigenvectors and eigenvalues of the data; and illustrated in the following figures.

Furthermore, PCA identifies the patterns in the data and expresses the data based on their similarities and differences (Lindsay I, S., 2002).

Therefore, any n by p matrix Y of rank r can be factorized for indicators²:

$$Y=GH'$$

Into an n by r matrix G and p by r matrix H , and any data input y_{ij} can be showed as two vectors g_i and h_j from matrices G and H , that is

$$y_{ij}= g_i h_j$$

Then, The vectors g_1, g_2, \dots, g_n are for the n rows of the data matrix Y and the vectors h_1, h_2, \dots, h_m are for the m columns of Y .

Finally, the singular value decomposition technique can be used for Y as follows;

$$Y= \sum_{i=1}^r \lambda_i p_i q_i'$$

Where;

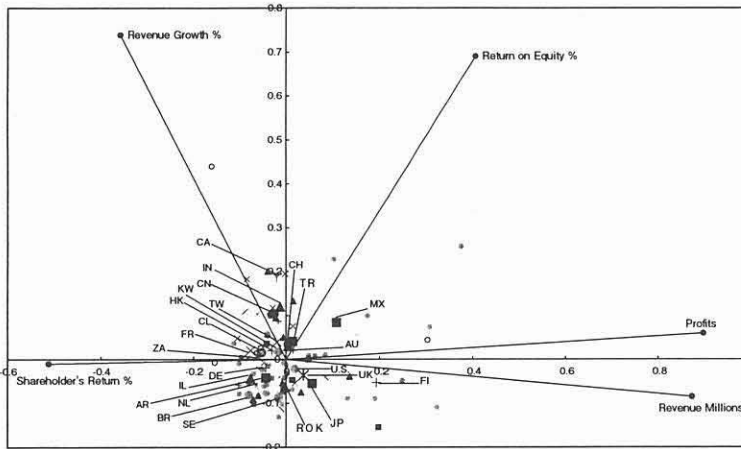
Lambdas are the positive square roots of the eigenvalues of the squared matrix $Y'Y$ and $0 \leq \lambda_1 \leq \lambda_2 \leq \dots \leq \lambda_r$

q_i is the i -th eigenvector of the squared matrix $Y'Y$

p_i is the i -th eigenvector of the squared matrix YY' (Gabriel, K.R., 1971).

The PCA output of the data is illustrated for top 100 ICT companies in Figure 21, extensively. A spectrum of possible redundancies in the figure from the five separate indicators (vectors) of r is relatively in low redundancy because one can hardly predict one from the other. However, the cumulative % of eigenvalues resulted in 42% for the first principle component (I PC) and 63% for the second principle (II PC), which better explains the correlation among the companies.

Figure 21.PCA for top 100 ICT companies

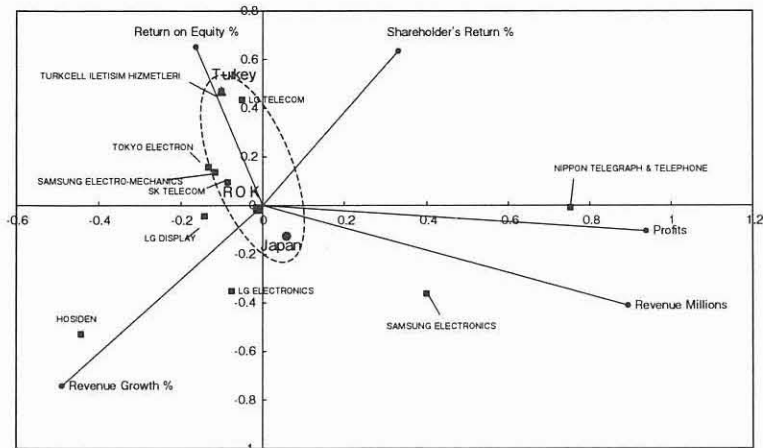


Source: Author's own calculations

Note: International country abbreviations are used in the figure.

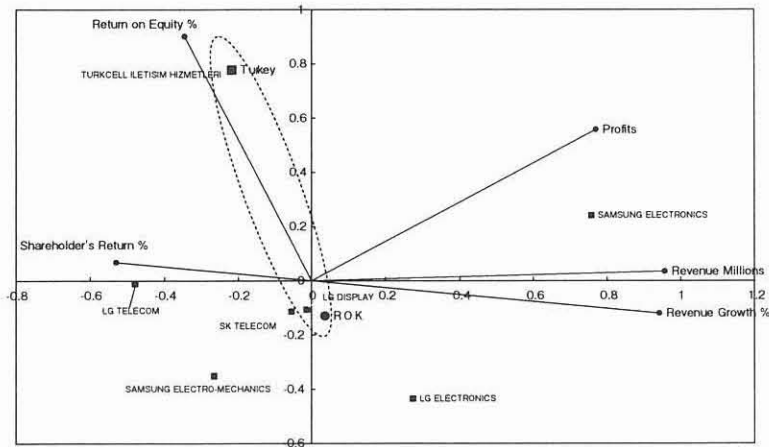
To analyze the three countries in detail, Figures 22-25 are given below. According to the Figure 22, in the correlation of three countries together, a partial similarity was observed in return on equity (%) among the companies of Turkey and ROK. In Figure 23, in the correlation of Turkey and ROK alone, a low redundancy appeared that Turkish and Korean companies are different in the point of vector compositions. A similar tendency also resulted in low redundancy in Figure 24 among Turkish and Japanese companies. Lastly, in Figure 25, partial company similarity occurred in revenue growth (%) and return on equity (%) among Korean and Japanese companies. Finally, it is difficult to conclude that these countries' companies have strong similarity in the ICT market operations depending on the number of companies of countries and their scopes.

Figure 22. PCA for ICT companies of Japan, ROK, and Turkey in top 100



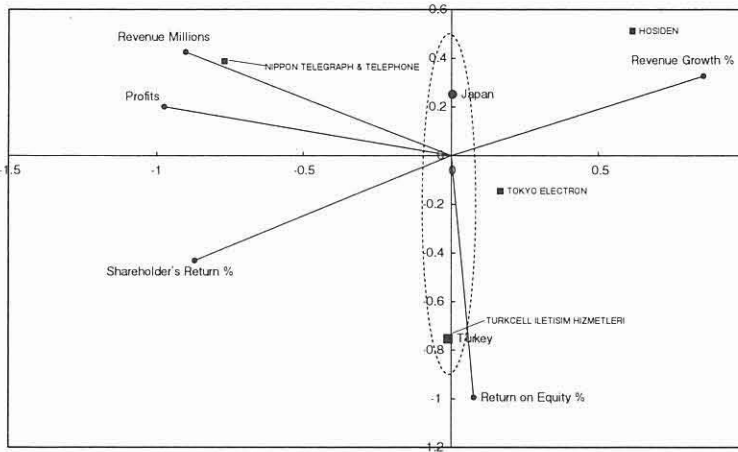
Source: Author's own calculations

Figure 23. PCA for ICT companies of ROK, and Turkey in top 100



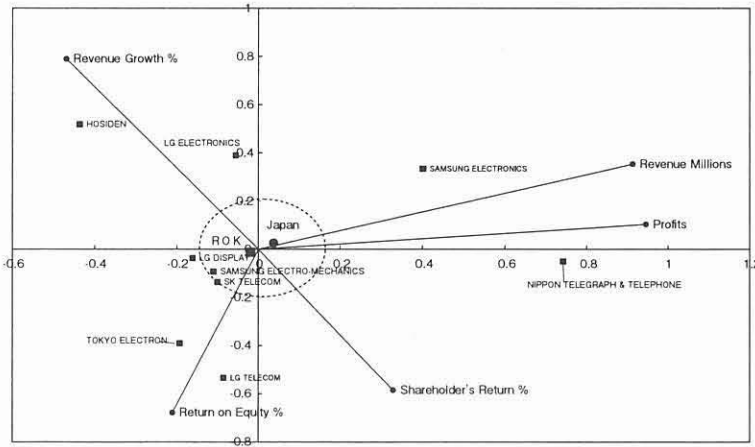
Source: Author's own calculations

Figure 24. PCA for ICT companies of Japan and Turkey in top 100



Source: Author's own calculations

Figure 25. PCA for ICT companies of Japan and ROK in top 100



Source: Author's own calculations

6. Lessons for Turkey and Concluding Remarks

Governmental policies exert a significant influence over the ICT within a national economy and among international economies. Korean government was more effective than Japan in adoption and diffusion of ICT. The lesson for Turkey is to first establish a stable government and determined policies. Japan and ROK created such an environment in earlier stages. In contrast to Japan and ROK, there are many difficulties over the ICT market in Turkey, which appeared in low ICT skill of employees, lack of investments and know how. Also the high costs and insufficient national and local telecommunication and internet infrastructure are the weak points of Turkey. As a result ICT

companies are not able to attain the technologies that they need (Bocharov, A. and Cherepanova, O., 2008).

In the case of policy implementation on ICT, Japan and ROK need to invest more in ICT to accelerate their rapidity of innovation in a more competitive global economy because they have strong and leader position with their market players (companies) at national and international level. As ICT sector is very competitive, such players need to take care of their position in the markets to sustain and improve. In this point, Turkey is a very dynamic economy and has active markets with its young population in the middle of the continents. Also, FDI resulted in heavy net inflow percentage of GDP that Turkey uses ICT investments to bring rapid improvements for her economy. Reducing import duties on ICT products, ensuring a high-quality, cost-effective telecommunications infrastructure, and accelerating efforts to increase domestic skills are deeply needed. For this reason, Turkey needs to make structural changes to attract more FDI and stronger market players such as Japan and ROK. This gives new market opportunities for the two economies covering the total market value of Turkey US\$ 36,067 millions (see Figure 20).

A notable difference between Turkey and Japan-ROK is the size and scope of companies in the related ICT sectors. For instance, Japan has eleven (Casio, Fujitsu, Hitachi, Kyocera Wireless, Mitsubishi Electrics, NEC, Sanyo, Sony Ericson, Toshiba, Panasonic, and Sharp Corporation) national and/or worldwide mobile phone makers operating in the markets and ROK has six (Bellwave, Innostream, LG Electronics or Cyon, Pantech Curitel, Samsung Electronics, and KTF Ever). There are few national makers of Turkey in smaller scopes and/or different backgrounds; however, no mobile phone maker at the national and international markets. It shows the importance of strong market players for Turkey that needs to establish her own.

According to the results of PCA within top 100 companies in ICT operations in the World, the correlation of Turkey with Japan and ROK resulted in a low redundancy that Turkish, Japanese, and Korean companies are different in vector compositions. It is difficult to state that these countries and their companies have a significant similarity in the ICT. Only, a partial company similarity occurred in revenue growth (%) and return on equity (%) among Korean and Japanese companies. In a word, PCA reconfirmed the dissimilarities and necessary improvements for Turkey.

Finally, as some major economic and ICT indicators are examined by comparison of Japan, ROK, and Turkey, the well-organized governmental policies and experiences of Japan and ROK can enhance Turkish economy as well as encourage new innovations through R&D, ICT investment, telecommunication technologies, and cooperative market players. Deciding for proper and

applicable plans, projects, and related policies Turkey needs to well analyze the socio-economic circumstances in the ICT markets to reach the most realistic investment climate and faster development targets.

Footnotes

1. As the number of ICT companies according to the countries in top 100, there are forty-three US companies, three JP companies, six KR (ROK) companies, one FI company, ten TW companies, three UK companies, five CN companies, one SE company, one MX company, two AU companies, two DE companies, three ZA companies, two CA companies, one CH company, two BR companies, one TR company, four IN companies, two HK countries, two FR companies, two NL companies, one CL company, one KW company, one AR company, and one IL company.
2. For the calculations of Y matrix and the illustrations in the figures, Biplot 1.1 applications are utilized in MS Excel.

References

- Bocharov, A.; Cherepanova, O., (2008): ICT market Turkey, Provoto Unified Communication Network, Provoto Analysis, Turkey, September 2008, pp.47-48.
- BusinessWeek, (2009): The InfoTech 100, 2009 ranking of the tops in tech showcases companies, (<http://bwnt.businessweek.com>).
- EU, (2009): European Union, Exchange Traded Fund (ETF) Country Plan, Turkey, pp. 1-2.
- Gabriel, K.R.; (1971): The biplot-graphic display of matrices with application to principal component analysis, *Biometrika* 58, pp.453-67.
- Hedrix, P., (2005a): Broadband in Japan and Korea, Background Briefing, May.2005, `p. 19.
- Hedrix, P., ((2005b): Broadband in Japan and Korea, Background Briefing, May.2005, `pp. 16-18.
- Hedrix, P., (2005c): Broadband in Japan and Korea, Background Briefing, May.2005, `p. 38.
- ITU, (2002): Turkey ICT Profile, <http://www.itu.int/ITU-D/ict/cs/letters/turkey.html>.
- ITU, (2005a): International Telecommunication Union, Ubiquitous Network Societies: The Case of the Republic of Singapore (in English), ITU New Initiatives programme, 6-8 April 2005, UNS-07, pp.6-10.
- ITU, (2004): International Telecommunication Union, Shaping the future mobile information society: The case of Japan (in English), February 2004, SMIS/06, pp. 5-6.
- KIEP, (1998): Korea Institute for International Economic Policy Korea's trade and Industrial

Policies: 1948-1998, Why the Era of Active Policy is Over, Chan-Hyun Shon, Junsok Yang, Hyo-Sung Yim, Working Paper 05, pp.36-49.

KIEP, (2002): Korea Institute for International Economic Policy, Trade Integration and Business Cycle Co-movements: the Case of Korea with Other Asian Countries, Kwansho Shin and Yunjong Wang, August 2002, Working Paper 08, pp.16-19.

KIEP, (2003): Korea Institute for International Economic Policy, Trade Structure and Economic Growth, A New Look at the relationship between Trade and Growth, Chan-Hyun S. and Hongshik L., published December 27, 2003 in Korea by KIEP, Working Paper 17, pp.12-13.

Lallana, C.E., (2004): An Overview of ICT Policies and e-Strategies of Select Asian Economies, UNDP-APDIP (United Nations Development Programme-Asia Pacific Development Information Programme), published by a division of Reed Elsevier India Private Limited ICT 4D Series, pp.4-5.

Lindsay I. S., (2002): A tutorial on Principal Components Analysis, February 26, 2002, pp.12-20.

OECD, (1999): Organization for Economic Co-Operation and Development, Regulatory Reform in Japan, Governance, OECD Reviews of Regulatory Reform, pp.91-101.

OECD, (2000a): Organization for Economic Co-Operation and Development, Regulatory Reform in Korea, Governance, OECD Reviews of Regulatory Reform, pp.89-99.

OECD, (2000b): Organization for Economic Co-Operation and Development), Information Technology Outlook 2000, ICTs, E-Commerce and the Information Economy, Information Society, pp.23-55.

OECD, (2007): Organization for Economic Co-operation and Development, World Information Technology and Services Alliance (WITSA), based on research conducted by Global Insight, Inc.

Okur Dincsoy, M., (2008): A Statistical Analysis of ICT Developments and Regional GDP per capita Convergence in Major East Asian Countries, Journal of Humanities and Social Sciences, Okayama University 26, p.128.

Okur Dincsoy, M., (2009): Can ICT Economically Catalyze a Regional GDP Per Capita Convergence?. A Case Study of Major East Asian Countries, Studies on North-East Asian Economies, Okayama University 7, pp.55-60.

WDI, (2007): World Development Indicators, CD data version 2007.