وزارة الإتصالات و تكنولوجيا المعلومات

Ministry of Information and Communications Technology

Analysis Report for the Project:

Assessment of the Economic Impact of ICT on: "Real estate, Renting and Business Activities".

The case of Jordan

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[September, 2011]

ACKNOWLEDGEMENTS

This study could not be possible without the support and cooperation with many parties; The author would like to thank the Department of statistics, Income and sales tax department, National center for human resources development (Al Manar) for providing the necessary data for this project. Thanks are also extended for colleagues in the Ministry of Information and Communications Technology for their kind review and support.

Executive Summary

The Hashemite Kingdom of Jordan was among the pioneers in the region to realize the economical potentials coming along with rapid developments in ICT that were happening in the last decade of the past century, therefore Jordan launched several initiatives during the past 10 years to leverage the economical benefits of ICT developments. Hence, strategic plans were developed and implemented; investments were made in various areas related to ICT, especially in the ICT infrastructure, people adaptation to ICT tools, liberalization and regulation in the ICT market and many others. In the same time few initiatives were more focused on leveraging ICT tools to move into Knowledge based economy.

The need to define efficient measures to assess the impact of ICT on the economy has been rising since the early stages of the journey, but due to the need to stay among the regional pioneers and the general realization of the need to frog leap, higher priority was always given to further development rather than assessment of achievements.

In the recent couple of years the need to assess the impact in order to design future initiatives and develop policies and strategies, helped in raising the priority for ICT Impact assessment.

The study at hand aimed to set a building block in defining and applying a more integrated performance model that will demonstrate the impacts of the ICT developments on the sector " **Real estate**, **renting and business activities"** in Jordan and the related economic activities.

In spite of all the challenges while identifying reliable sources for statistical data needed to measure the ICT impact, the author managed to develop a valuable tool that is robust yet flexible enough to accommodate the rapid developments in ICT technologies.

Accordingly, Jordan can gain benefits from applying periodic comprehensive ICT impact assessments, as the outcomes will help policymakers better design, develop, implement and monitor their policies and strategies. In addition, these results demonstrate the need to integrate ICT related initiatives with sectors' plans to promote and develop this sector.

According to this study outcome, ICT sector has a positive impact on the Real Estate Sector and its related activities in terms of productivity, labor productivity, value added, employment and taxation.

Based on the latest published figures for the year 2008, the study shows that 37% of the increment in the sector's productivity comes from the ICT use; moreover, it helps to increase labour productivity by 29% and the value added of the sector by 41%. Regarding the employment impact, the study shows that ICT can reduce the unemployment rate by stimulating other sectors to create more job opportunities; applying ICT in this sector can create more than 8500 job opportunities to the economy. In addition, ICT play a significant role in enhancing the role of Fiscal policy, this couldn't be by increasing the amount of taxes collected by the Ministry of Finance which exceeded JD 2M in this study.

It is urgently needed to promote the results of this study and build on the achievements made in this project to come up with a complete comprehensive framework to periodically assess ICT impact,

which means that many stakeholders need to work hand in hand to ensure the availability of the required data upon running the Impact Assessment Model to ensure more accurate results which in turn leads to ability to make better decisions towards ICT diffusion; hence maximizing positive impacts of ICT to the overall economy.

Contents:

List of Abbreviations:

CBJ: central bank of Jordan

DoS: Department of statistics

ICT: Information and communication technologies.

ISIC: International Standard Industrial Classification.

ISTD: Income and Sales Tax Department

MoICT: Ministry of Information and Communications Technology.

NCHRD: National Center for Human Resources Development

Note: **Real estate sector where mentioned in this report means the studied activities of Real estate, renting and business activities unless otherwise mentioned.

1 Introduction

This document serves as a corner stone to help ICT policy makers to maximize the benefits and the positive impacts from ICT, and to help them in maximizing the benefits from their investments in the information and communication technologies.

The report in our hand tackles the subject of "Assessment of the Economic Impact of ICT on the sector “Real estate, renting and business activities” in The Hashemite Kingdom of Jordan". Hence, key results were addressed in this report in order to ensure delivering a direct and clear message to the concerned stakeholders.

this report provides a brief about the importance of ICT in this sector, explains the methods and the approaches followed to conduct assessment and obtain the required results, it provides an overview of the "Impact Assessment Model" that was developed and applied during this project to become the tool used now and in future to assess and identify the ICT impact on the Jordanian economy, this report also elaborates the key results, study limitations, and the proper recommendations.

Although the author has faced different challenges to identify and assess the economic impact of ICT on the chosen sector, the results will still serve as a good baseline for future assessments and more project enhancements.

2 Study Approach

The scope of the study is concerned with the impact of ICT on the Real estate sector per se and its related activities.

This project is considered to be the third phase for the economic impact of ICT on economic sectors. In the first phase five sectors have been studied based on a well established approach to assess the economic impact of ICT on the selected sectors, starting from the selection of the representative sectors to be studied through assessing ICT use as well as impact on those sectors, these sectors were: manufacturing, health, education, financial services and wholesale and trade sector whereas Tourism sector has been chosen in the second phase and Real estate for the third.

The next step was identifying and defining the aspects that will be tackled in this study which are: Productivity, labor productivity, impact on GDP measured by the value added, Taxation, employment and female gender aspect, in addition to the indices and sub-indices that cover these aspects.

Data were collected to cover the period (1994-2008) as the latest published figures for the economic survey by DoS are for the year 2008. Descriptive analyses were based on actual data while in regression analysis the period was extended by adding estimates for the missing data based on historical trends for every singly variable.ICT indicators required to assess the impact on economy were identified depending on international standards, and they were adapted to fit the Jordanian economy and ICT environment.

An “Analysis Model” was also developed to serve as the tool to assess the impact on the sector level as well as on the activity’s level. The macro model, per se, is a combination of activity-based sub models; each activity has been analyzed by a separate sub-model then they were aggregated and summarized in the macro model.

The model was built and rolled out on the available data, Some of the data for certain aspects were unavailable, thus a multi-pronged approach to augment the model and close the data gaps was used through identifying a series of proxy indicators, and applying some estimation approaches based on the historical trend of each separate series and the similar -in nature- variables.

In order to assess the main ICT aspects of the business environment, the Impact assessment model identified and measured the following aspects:

- Gross Domestic Product
- Taxation
- Female Gender aspects
- Organizational Structure and Firm size
- Quality of Information
- E-Government
- Environment
- Quality of Labor
- Flexibility of Employment
- Supply and Demand

- Outsourcing
- Urban/Rural Divide
- Cost

Some of the above mentioned aspects couldn't be studied due to the wide range of data gaps which could be covered by specific future surveys.

The following diagram provides an illustration of the study approach described in this section.

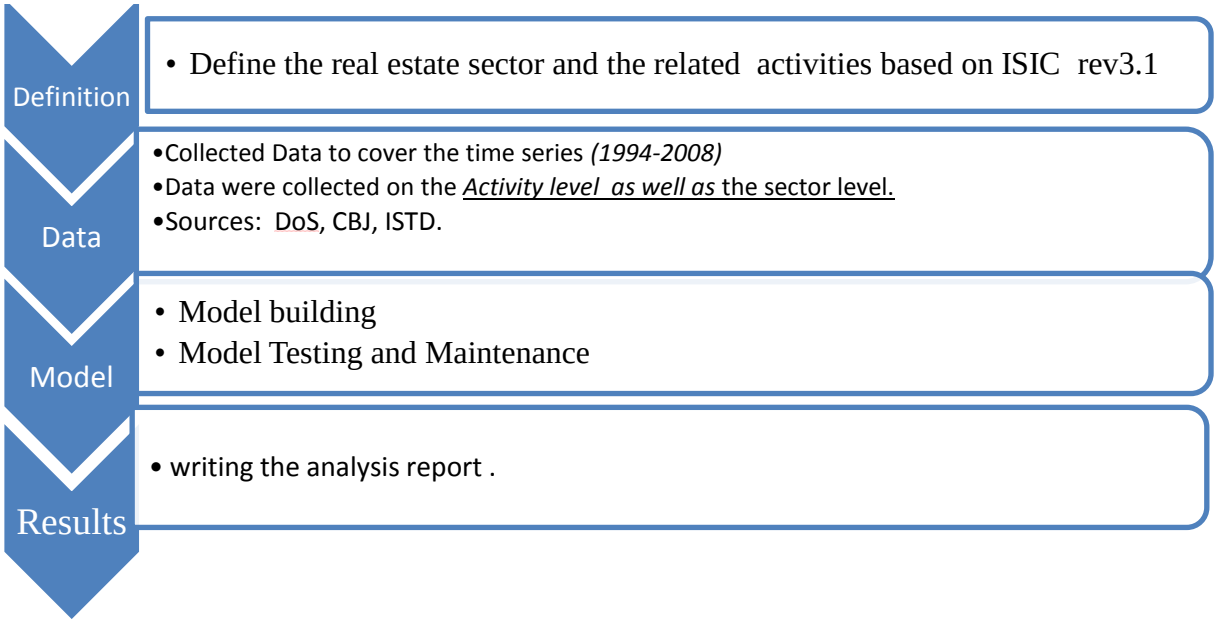


Figure 1: Study Approach

Based on the findings of the study, recommendations were developed to measure the impact of ICT.

Data Sources:

Collected Data cover the period (1994-2008), The Main data sources - as previously mentioned- were: DoS different data sources: the economic survey, employment and unemployment survey income and expenditure survey…etc , NCHRD, CBJ and ISTD.

3 Real Estate, Renting and Business Activities

Real estate is currently one of the fastest gowning industries across the world. It renders services to various classes of people.

According to the ISIC rev3.1 , the" real estate, renting and business activities" sector comes under the Code K . within this sector, the underneath activities will be assessed for the economic impact of ICT as below:

Table (1): Real Estate, renting and Business Activities*:

ISIC	Activity name
7010	Real estate activities with own or leased property
7020	Real estate activities on a fee or contract basis
7121	Renting of agricultural machinery and equipment
7122	Renting of construction and civil engineering machinery and equipment
7123	Renting of office machinery and equipment
7129	Renting of other machinery and equipment n.e.c.
7130	Renting of personal and household goods n.e.c.
7310	Research and experimental development on natural sciences and engineering (NSE)
7320	Research and experimental development on social sciences and humanities (SSH)
7411	Legal activities
7412	Accounting, book-keeping and auditing activities; tax consultancy
7413	Market research and public opinion polling
7414	Business and management consultancy activities
7421	Architectural and engineering activities and related technical consultancy
7422	Technical testing and analysis
7430	Advertising
7491	Labour recruitment and provision of personnel
7492	Investigation and security activities
7493	Building-cleaning activities
7494	Photographic activities
7495	Packaging activities
7499	Other business activities n.e.c.

Source: unstat

*** some of ICT activities are located under the division 72, and they were studied in the previous phase of the Economic impact as they are considered as Tourism related activities.**

*** As for the activities 7121 and 7123; no data is available about them in DoS, so they will be dropped from the analyses. For activities 7422, 7494, 7320 and 7495, the available data about them are not enough to be statistically analyzed (not enough to run any regression analysis).**

4 The Role of ICT in Real estate sector:

The great impact that ICT makes in companies is the application of information and communication for management purposes, both internally and externally. ICT may help economic sectors improve their competitive advantage by speeding up their internal processes and information exchange. The organizational value creation of ICT brings the efficiency and effectiveness to an organization; it is reducing costs and increasing the quality of processes and services. However, in order to benefit from ICT, the relative advantage of ICT has to match an organization's needs, values and objectives.

Contemporary, information society has made real estate sector a highly information-intensive industry as ICT has a potential impact on it. The role of ICT in real estate cannot be underestimated and it is a driving force in the current information driven society. It has provided new tools and enabled new distribution channels, thus creating a new business environment. ICT tools have facilitated business transaction in the industry by networking with trading partners, distribution of product services and providing information to consumers across the globe.

The ICT Sector has witnessed immense improvement in recent years in terms of high prevalence and diversity of services provided in addition to increasing the volume of investment and employment in this sector. The rapid technological development in ICT has led to significant impact in various economic and social fields, which are clearly reflected in the performance of economic establishments through increased productivity, improvement of work, promoting competition and provision of better services to consumers.

Recent development of ICT is changing our economy and society in a rapid way. Electronic commerce, internet, and related activities demand more data processing power, more memory and more speed. Due to this surging demand for ICT, the industries which provide ICT goods such as computer, software telecommunications equipment are growing enormously and are becoming to have importance.

Real estate is an information intensive business. It is therefore inherently amenable to application of ICT tools and services. The Internet and the World Wide Web has provided unprecedented impetus to the Real Estate industry, Information Management has helped in streamlining the real estate sector and in managing the voluminous documentation processes that is inherent of the industry.

In the aftermath of 9 /11, ICT has added value to real estate by providing much needed security systems. Computer Aided Design (CAD, Geographic Information System (GIS) and GMN) have taken the Real Estate industry to new heights of efficiency and business achievements. The brokerage firms, the real estate agents, the property managers and the sellers - everybody has benefited from the proliferation of ICT in the Real Estate industry.

ICT has opened many new avenues for the buyer of real estate who now has the information, the options and the means available in a variety of forms and access mechanism to make the most judicious and optimal selection from a wide variety of choices . ICT has transformed the Real Estate industry. Properties of the real estate market include retail, office, industrial and multifamily investments. The buying, selling and management of these properties are done by a large service sector.

we don't want to miss the importance of ICT in providing the proper connectivity; ICT helps the real

estate industry to bring together people and information. For example, information from a real estate developer's job site may be shared with field operations, production scheduling, accounting, sales and many other internal departments, moreover to the outside business contacts such as architectural and engineering firms.

ICT can help real estate to mitigate with the business cycle and economic fluctuations, Aftermath the financial crisis, real investment such as real estate have replaced the financial ones as a confident source of investment. Moreover; working under uncertainty requires the use of inventory management systems and risk managements in order to plan for the sector. Quick response is also needed, E-mail implementation, web site development, high speed Internet access...etc, automating the data capture and reporting processes within a company.

It is worth mentioning the role of IT in companies; successful companies use IT to reduce costs and improve operational efficiencies, through higher end connectivity solutions, an employee in the field might be able to electronically transmit up-to-date information to an IT system in the corporate office. The information is updated real time and provides management with information not readily available anywhere else. IT might be used to automate the process of producing construction budgets, writing commitments and tracking payments to vendors. Each organization has a unique environment that makes it difficult to protect against new and emerging threats, so the need for network and security assessments appears in order to help organizations identify, manage, and reduce their risks.

ICT is a key reason for the quickening pace of the corporate real estate evolution. ICT is critical in the linkage between the parts of a company that previously had not been linked. This has become even more important in the context of corporate alliances and support of long-term company goals. Corporate real estate executives are evaluating new information technologies and the impact upon their organizations. A key question is what role ICT play in helping a company become more effective, improve service and measure performance while adding value to their business.

5 The Real Estate Sector in Jordan:

Lately, the real estate and construction sectors have been of the most active sectors of the Jordanian Economy. After the global financial crisis banks began to tighten their restrictions on granting facilities, particularly to the real estate sector. Oil prices dropped and stock prices worldwide went into free-fall, leading to a colossal loss of wealth and a dry-up of liquidity. The real estate bust in Dubai further damaged investor sentiment, as fears of a ripple effect reaching Jordan began to build up. In 2008, the Global Property Guide had ranked Amman in position 42 on the "World Most Expensive Residential Real Estate Market Guide List". But in early 2009, the ranking had slumped to position 105 after witnessing a 10%-15% decline in prices compared to last year. To mitigate with theses circumstance, the Jordanian government adopted a rigorous set of corrective macro and micro measures. The measures addressed selected sectors including exports and private investment, particularly investments in real estate and energy.

Government initiatives were also from the effective factors on real estate sector, they include Issuing and amending Investment Promotion Law, The Landlords and Tenants Law, The recent decision to waive sales tax and registration fees on the sale apartments and housing units of areas less than 120 square meters instead of 150 square meters. The Master Plan which aims to provide clear direction for the sustainable development of the city of Amman over the coming period in accordance with new planning legislation, Reducing the tax rate on real estate sales, for unused or cultivated lands, by 50 percent of the rate specified in article (3) in the Land Registration Duties Law for idle and cultivated lands.

5.1 Real Estate Sector Drivers

Several factors have been at play when it comes to the shaping of the real estate sector in recent years. To start with, the most significant factors at play were the political unrest witnessed in the region and the excess petrodollars that have been feeding into the Jordanian economy. The after effects of the September 11th attacks on the US are at the forefront of the reasons behind the boom in Jordan's real estate market, which led investors to look closer to home to invest their excess petrodollars more over going toward the real investments.

Furthermore, factors such as a growing population, a young population, increasing credit facilities, flourishing tourism and a favorable investment climate have also helped fuel the boom in the real estate market and increased FDI. The government's continuous efforts in increasing privatization and further boosting the role of the private sector have also helped push the boom in the Jordanian real estate sector. With the majority of countries in the region experiencing some level of instability, tourists began to favour Jordan for their holiday destination. The Country also became an asylum for refugees from Iraq looking to wait out the war in safety. With a young and growing population, coupled with the large influx of visitors to the Kingdom, a strong need for additional housing has arisen. Jordan has become home to huge residential compound projects, and copious apartments of all shapes and sizes. This has impacted the hotel industry as well, with occupancy levels reaching their peaks, creating a demand for new hotels with emphasis on the prime tourist attraction areas, Aqaba and the Dead Sea.

5.2 Glimpse of Major Real Estate Projects in the Kingdom

There are other several real estate projects in Jordan, they could be segmented as follows:

1) Residential: such as Royal village (amman), AL Hummar Hills (Amman), Greenland (amman), Ahl Al Azm Project (amman), gardens Villas (zarqa), Al Jiza Residential City (amman), Andalusia Village (amman), Al Rawda Village (Zarqa)

2) Residential and commercial such as , Abdali Regeneration Project (amman), Madinat Al Sharq (zarqa).

3) Touristic and Mixed Use, such as , Aqaba Palm Hills, Ayla Oasis Development project (dead sea), Samarah Dead Sea Golf & Beach Resort, Saraya Aqaba, Saraya Dead Sea, The Red Sea Resort Project, Ayla Park (aqaba), Tala Bay (aqaba)

4) Commercial; the Gulf Finance House (Jordan gate), Taameer (Al Mushatta Industrial City)

Real estate boom has also affected the retail market, not to miss out that the latter has also been on the receiving end of consumer demand. to rectify this, many malls have been established such as Mecca Mall, followed by City Mall, in addition to other shopping centers and smaller malls, such as the Istiklal and Mukhtar Malls, Aqaba Mall & Resort, Abdoun Mall. The Kurdi Group has also announced plans to develop a JD 400 million “Jordan Mall” on the airport road.

Geographically, the urban real estate market is divided into three regional centers, namely; Amman, Zarqa and Irbid. According to the Department of Lands & Survey (DLS) approximately 43.0 % of real estate investments were invested in Aqaba in 2007, while Amman constituted around 40.0 % of total real estate investments. The Zarqa and the Dead Sea accounted for 11.0 %.

Real estate has a direct impact in supporting the growth of other economic sectors, particularly the construction sector, which has a spill-over effect to other areas of the economy, creating job opportunities and generating demand for other supporting industries, to name a few; steel, cement, wood, glass, aluminum. It also has a bearing on the financial services sector, with opportunities arising for banks to offer financing to real estate companies and contractors, in addition to providing retail facilities in the form of mortgages for the purchase of land and property. Unsurprisingly, there has also been a distinct correlation between the real estate market and the capital markets, due to the large number of real estate companies that are listed on the stock exchange.

The strong demand on real estate in the Kingdom has led to prices of land and property multiplying to levels no longer affordable by the average Jordanian, thereby driving locals to relocate to the outskirts of the city, which were once remote barren areas, where prices remain slightly lower than the Capital.

5.3 Sector's SWOT Analysis

Analyzing the real estate sector requires having a deep look at its SWOT analysis; details are summarized in table below

Table (2): Real Estate sector's SWOT analysis

Strengths • Property & land underpriced compared to region • Wide potential for growth • Lower exposure to a "crash" compared to the capital markets as real investments. • Supportive Government promoting the development of the sector	**Weaknesses** • Lack of well-established regulations and controls • Prices have reached unaffordable levels for the bulk of the local population • Fears in the market of the "bursting" of the real estate bubble • Lack of supporting infrastructure, leading to a shortage of parking spaces and traffic congestion
Opportunities • Growing market • High liquidity and FDI flows • Downturn in capital markets diverting attention to real estate market • Recent regulations supporting the growth of the sector such as the investment promotion law • Increasing availability of mortgage financing • Growing population driving a need for property development • Instability in the region continues to drive the boom in the local real estate sector	**Threats** • Geopolitical threats • Economic slowdown • Rising prices of construction materials • Rising interest rates

Source: Real Estate Sector Report, 2007.

5.4 Sector's Economic indicators

Jordanian economy successfully surpassed, to a large extent, the global financial crisis and the large increase in international prices of basic commodities during 2010. According to CBJ annual reports, a real GDP figures show a growth of 3.1 percent for 2010 calculated at constant market prices comparing to 2.3 percent in 2009. This improvement in economic activities during 2010 is mainly attributed to a strong recovery in services and fast expansion of exports.

The construction sector contracted 8.1 percent comparing to an expansion of 12.9 percent in 2009. Construction, accordingly, pulled down the overall GDP growth rate by 0.5 percentage point. Further, the relative importance of the sector in GDP declined 0.7 percentage point to reach 5.5 percent. The performance of constructions was mainly influenced by the rise in the prices of raw materials, particularly, cement and iron and the slowdown in the demand for real estate.

The performance of the sector" Finance, Insurance, Real Estate and Business Services" (according to CBJ, all are grouped in one sector) improved remarkably as the national economy was recovering

from the global financial crisis. The value added of the sector grew at 4.6 percent, comparing to a decline by 0.7 percent in 2009. Consequently, the contribution of the sector in GDP growth rate improved to reach 1.0 percentage point. The "real estate services" grew by 4.4 percent comparing to a growth rate of 3.5 percentage in 2009. The contribution of the latter subsector to GDP growth rate was slightly improved to reach 0.5 percentage point. Accordingly, "real estate services" accounted for 56.8 percent of the whole sector.

Residential permits:

As an indication for the growing sector and according to CBJ figures, the number of total permits increased from 21703 in 2008 to 25238 in 2009, then to 26,660 in 2010, the majority of them were for residential purposes and concentrated in Amman, Irbid and zarqa. (CBJ website data base)

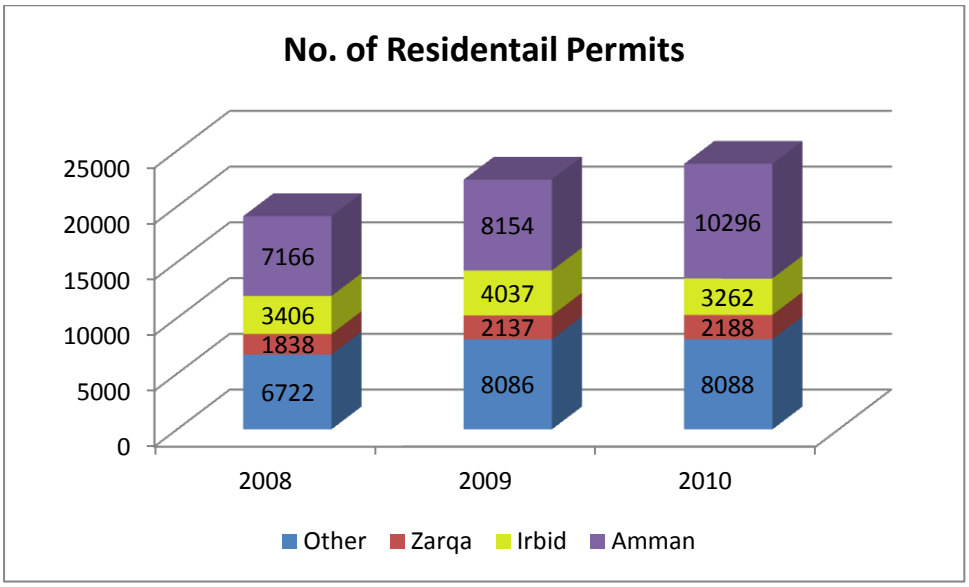


Figure (2) No. of Residential Permits in Jordan for the period

Data Source: CBJ

Employees:

According to Dos figures for the year 2009, the total number of employees working in this sector reached 47157 employees, the majority of them was males with a ratio of 81% whereas the female's reached only 19%. Regarding the nationality of the employees, the majority was Jordanians with a ratio of 92.3%, Egyptians ratio reached 6.5%. Chart below shows the distribution of employment according to the nationality for the year 2009.

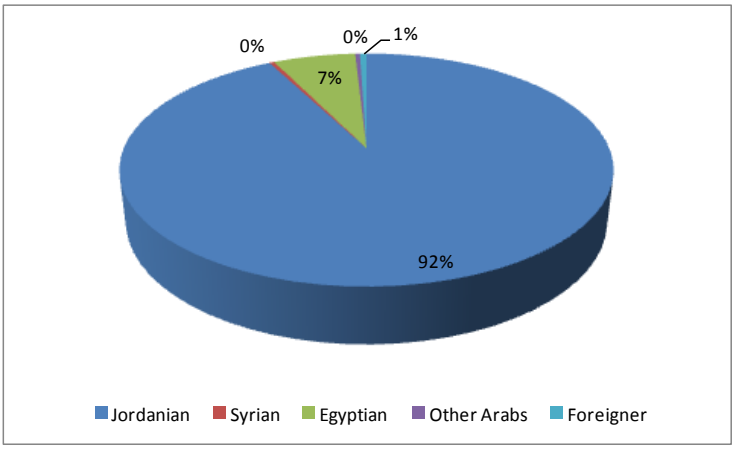


Figure: (3): the distribution of real estate sector employees according to the nationality

Data Source: DoS, Economic survey, 2009

Firms:

Real estate is a small firm concentrated sector, 89% of the establishments working in this sector were less than 5 employees for the year 2008, and establishments with 5-19 employees constitute 9% from the total ones working in the sector. Pie chart below summarizes the distribution.

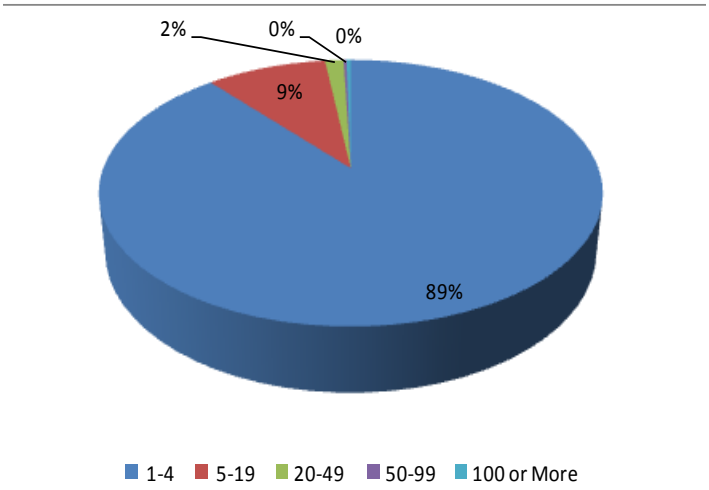


Figure (4): the distribution of the sector's establishments according to employment categories, 2008

Source: DoS, Employment survey.

Contribution to GDP:

The sector's contribution to GDP at current market prices reached 9.2% in the year 2009 compared to 9.3 in 2008, with a small decline ratio.

The figure below depicts the GDP of the real estate sector for the period (2006-2010), it's clearly shown that the it is an upwardly growing sector; it grew by around 10% in 2010 JD (1,433) million compared to 7% in 2009 JD (1,301) million and 2.5% in 2008.

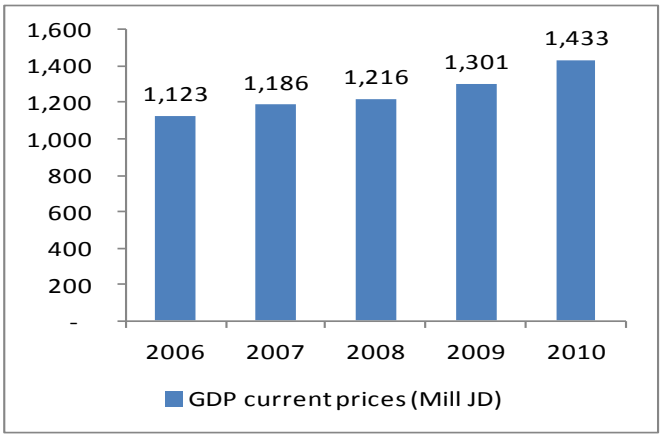


Figure (5): The GDP of Real estate sector in Current prices

Source: DoS, National accounts

6 Micro-level (Activity-Level) analyses:

The Department of statistics provides segmented data on activity level (4-digits ISIC number) mainly through the economic survey. The latest published figures for the activities' economic indicators are related to the year 2008

6.1 Gross output 2008

The Total gross output for the previously mentioned activities reached the value of (000 JD) 307,517 in the year 2008. The highest share was for the activity "Architectural and engineering activities and related technical consultancy", this activity accounted for 21.7% of the total gross output, and the second rank was for Legal Activities with a share value of 12.3% followed by real estate with own or leased properties. Figure below shows the detailed gross output for these activities.

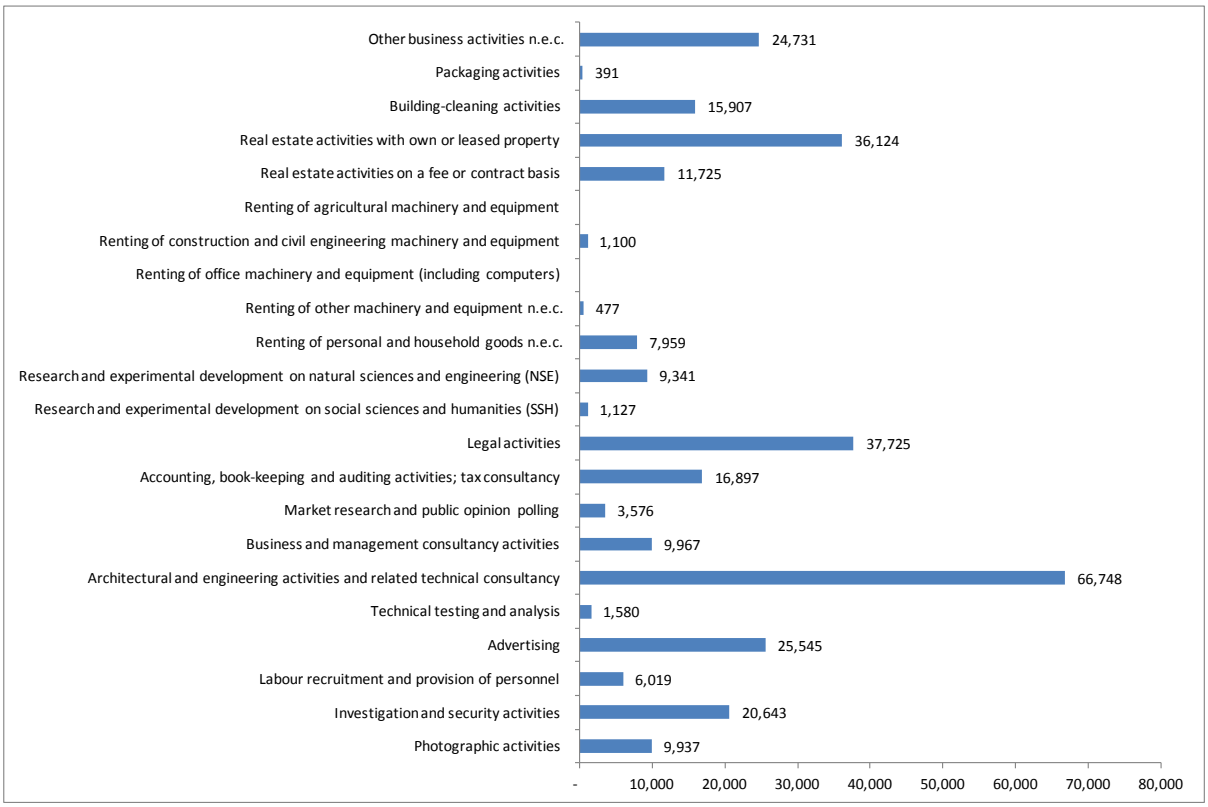


Figure (6) Activities' Gross output

Data Source: DoS, Economic surveys

6.2 Gross Value added

The total value added for these activities reached (JD 000) 226,153 for the year 2008, the highest share was also for "Architectural and engineering activities and related technical consultancy" with a share of 24% of the total gross value added of the activities followed by Real estate activities with own or leased property with a value of 13%. Figure below shows the values of gross value added for each activity.

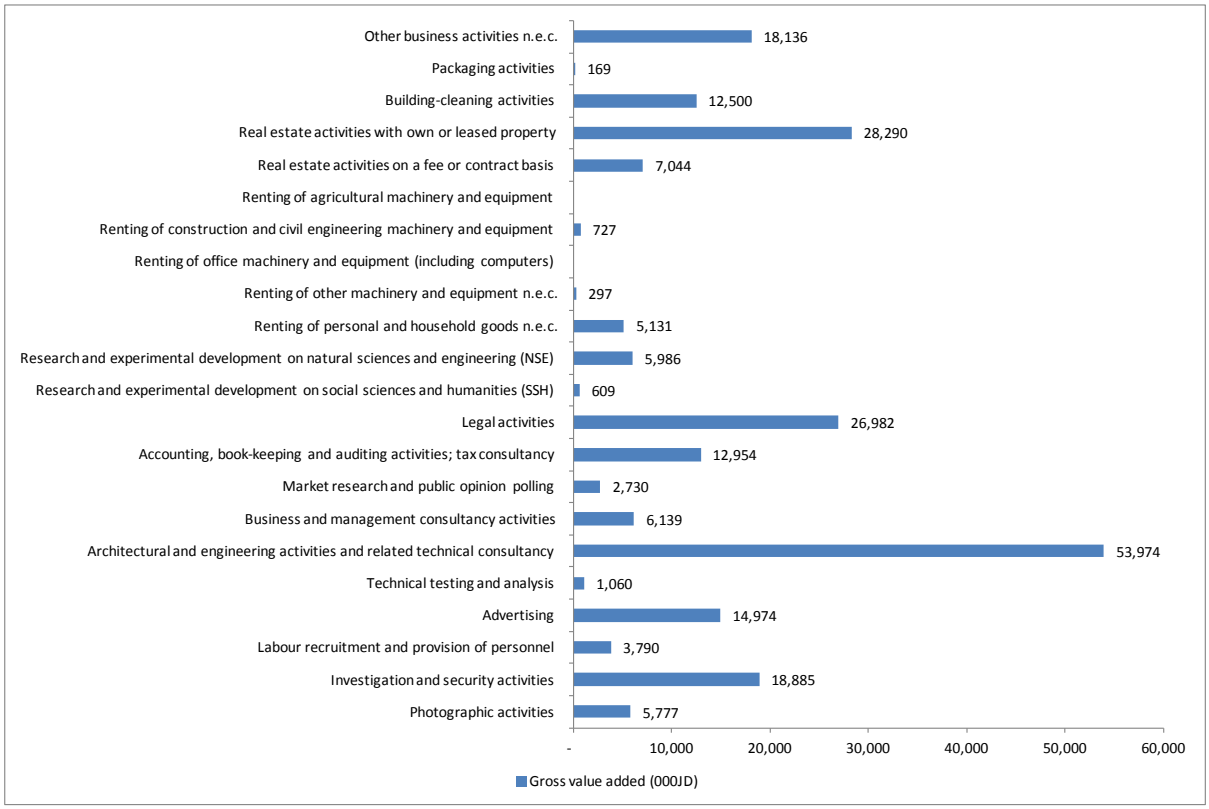


Figure: (7) Activities' Gross value added

Dat Source: DoS, Economic survey

6.3 Employee's compensation

Figure below indicates the value of employees compensation for the year 2008, the aggregate value for the activities exceeded JD 100 million, Architectural and engineering activities and related technical consultancy ranked the first with a share of 29% followed by Investigation and security activities with a share of 15%

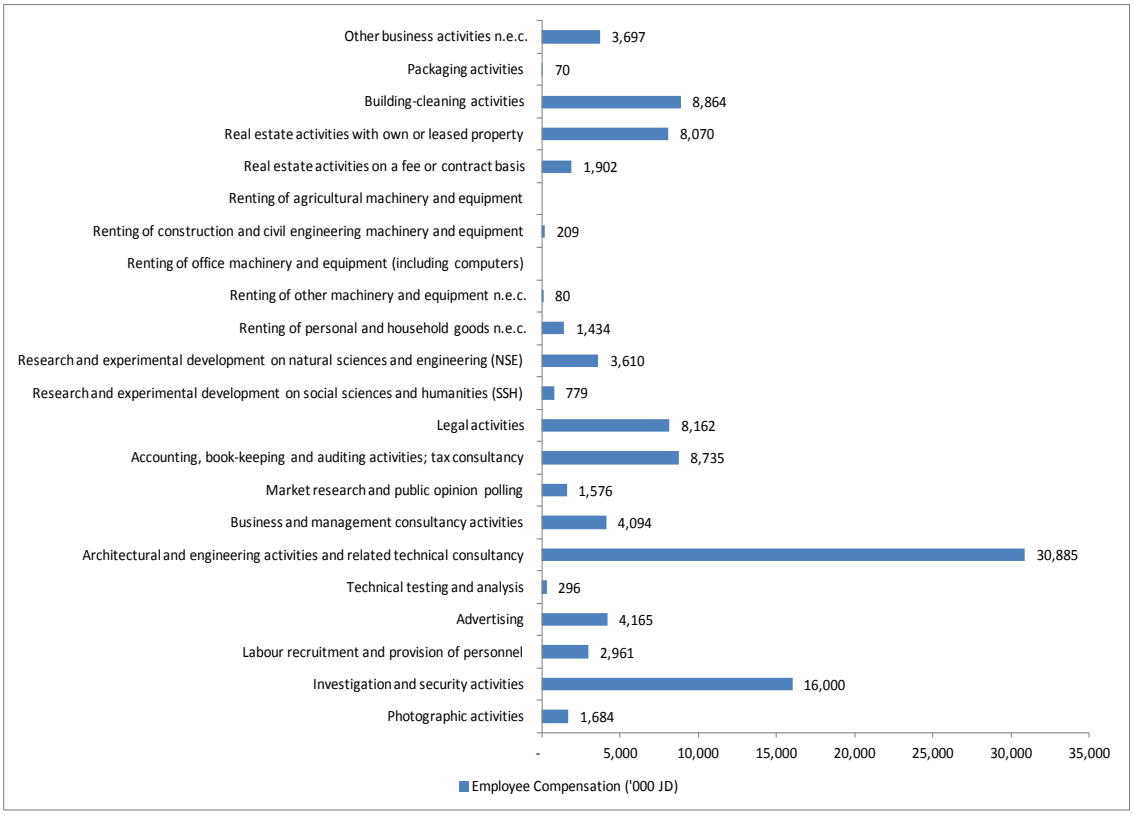


Figure (8): Sector's Employees' compensation

Data Source: DoS, Economic survey.

6.4 Total Employees:

The total number of employees in the studied activities exceeded 37,000, the story is different in terms of ranking; the highest activity was "Investigation and security activities" with a round one-third of the total number followed by Building-cleaning activities with a share value of 17%.

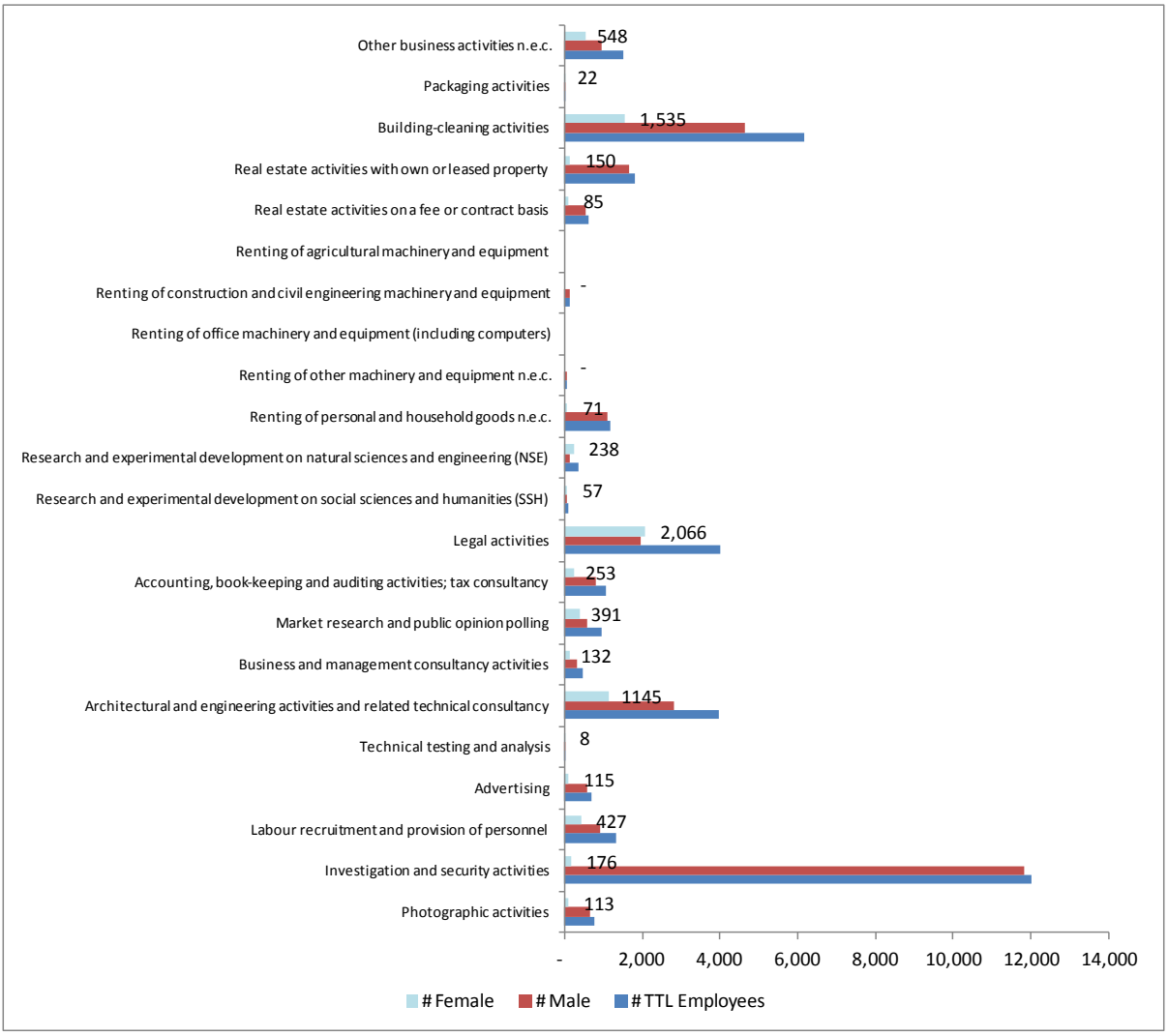


Figure (9): Total Sector's employees, females and males.

Data source: DoS, Economic Survey.

In terms of gender distribution, 80% of the employees working in these activities are males and only 20% are females.

The highest ratio of males was, as expected, for investigation and security activities as a male-concentrated activity, it accounted for 40% of the sector's male employees, whereas the highest ratio of female employees was for legal activities with a share value of 27% of the total female employees in the sector.

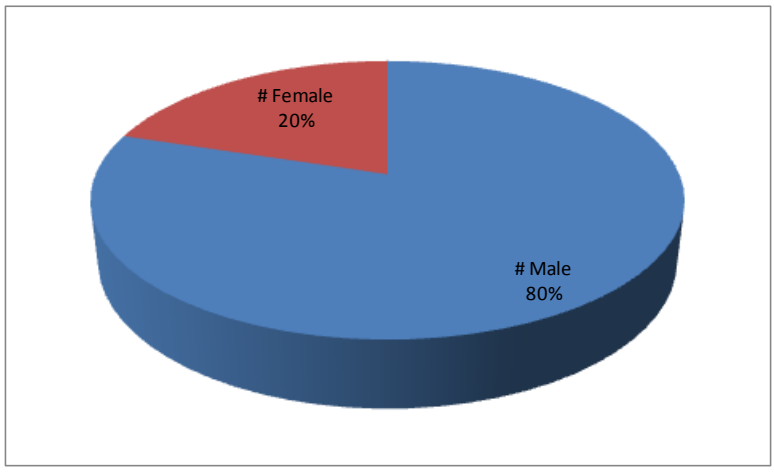


Figure (10): The Distribution of the sector's employees according to the gender.

Data source: DoS, Economic survey.

Figure below summarizes the, previously mentioned, sector's economic indicators.

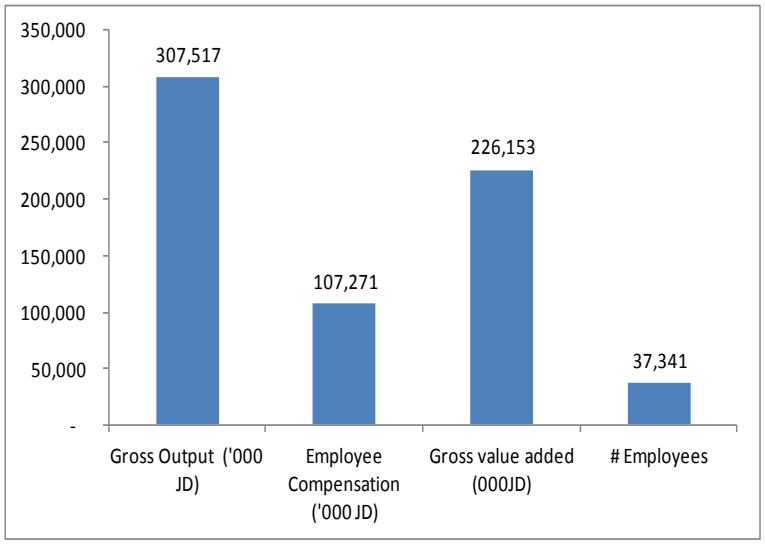


Figure (11): activities' Economic indicators

Data Source: DoS, Economic surveys.

6.5 Taxation:

The total taxes value collected from the studied activities exceeded JD 117 Million for the year 2008, sales tax accounted for 73% of the total collected taxes the is due to the nature of these activities which deal with high-value sales , 15% were collected from employees as income taxes and 12% from companies as income taxes.

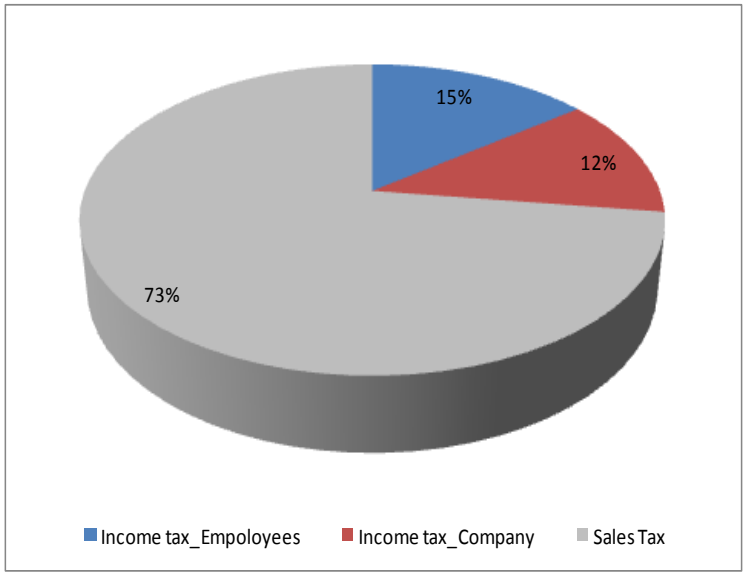


Figure (12): sector's sales and income taxes

Data Source: ISTD, 2008

For income taxes (whether for employees or for companies), the Real estate activities with own or leased property ranked the first for the two types, as workers and firms working under this activity deal with assets with high financial values (income-generating assets). 74% and 44% were the share for employees income taxes and companies', respectively.

For sales tax, the highest was for the activity of advertising (around 20% of the total sales tax), this is due to the high revenues the advertisement activities gain.

7 ICT Impact Model Overview

The ICT Impact Assessment Model is a flexible tool, developed based on all study aspects, related factors and formulas. The Model may be utilized in the future through adding more sectors/ activities updating the data, and filling in the data gaps.

To detail the assessment of the impact of the ICT on the Real Estate sector and its related activities, several aspects of the business and economic environment were identified. The analyses were completed on the macro (sector) as well as the micro level (activity).

Within each of these levels; productivity, labor productivity, employment, research and development, and other aspects of the business environment were measured. However and due to significant and fundamental data gaps, only value added, productivity, labor productivity, employment, female gender aspect, and taxation have been tackled.

In order to test for and measure the marginal effect of ICT variables on the pre-mentioned aspects; each of these aspects was assessed by using the econometric analysis depending on 5% significance level for all the regression models (the commonly used level

7.1 Value added:

- The ICT impact on sector's value added was assessed by measuring the amount of change in the value added to the whole sector due to the diffusion of ICT in the sector. This amount of change has been calculated relatively to the total amount of GDP.

7.2 Productivity:

- The ICT impact on **Productivity** was assessed by measuring the extent to which the diffusion of ICT in a sector will change the levels of return a firm receives from an input during production.

  Therefore and as illustrated in the below diagram and equation, among all factors ICT impact on productivity is measured by regressing the productivity against the ICT related factors i.e. Capital ICT and ICT index.

  It is worth mentioning here that the ICT index, per se, was developed for the purpose of this study. It is a weighted-complex index consists of four main sub-indices: ICT Adaption, Readiness, E-government and E-business.

  De facto; these sub-indices were developed by grouping the homogeneous indicators with each others in an attempt to allocate the proper weight. The main source for this index is the" ICT in business survey" Moict collaborates with DoS to conduct.

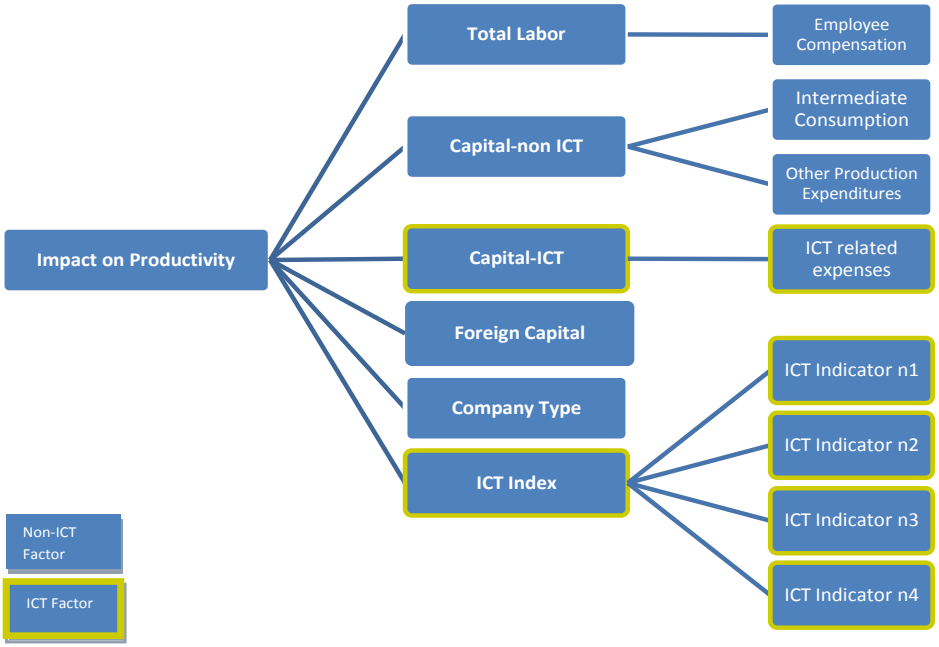


Figure 13: Impact on Productivity Factors

The productivity regression equation took the following form:

$$GO = \beta_0 + \beta_1 Labor_C + \beta_2 (K)_{ict} + \beta_3 (K)_{non\text{-}ict} + \beta_4 FK + \beta_5 comp + \beta_6 ICT + €$$

Where:

GO : Gross output

$Labor_C$: Labor Compensation

$(K)_{non\text{-}ict}$: Capital-Non-ICT

$(K)_{ict}$: Capital-ICT

FK :Foreign Capital

Comp :Company Type (according to the employment size categories)

ICT : ICT index

€: error term

7.3 Labor productivity:

- The ICT impact on **Labor Productivity** was assessed by measuring the extent to which diffusion of ICT in a sector will change the level of output a firm receives from labor input.

  Therefore and as illustrated in the below diagram and the accompanied regression equation; impact on labor productivity is measured by regressing the labor productivity against the ICT related factors i.e. Capital ICT and ICT index (as in the previous step).

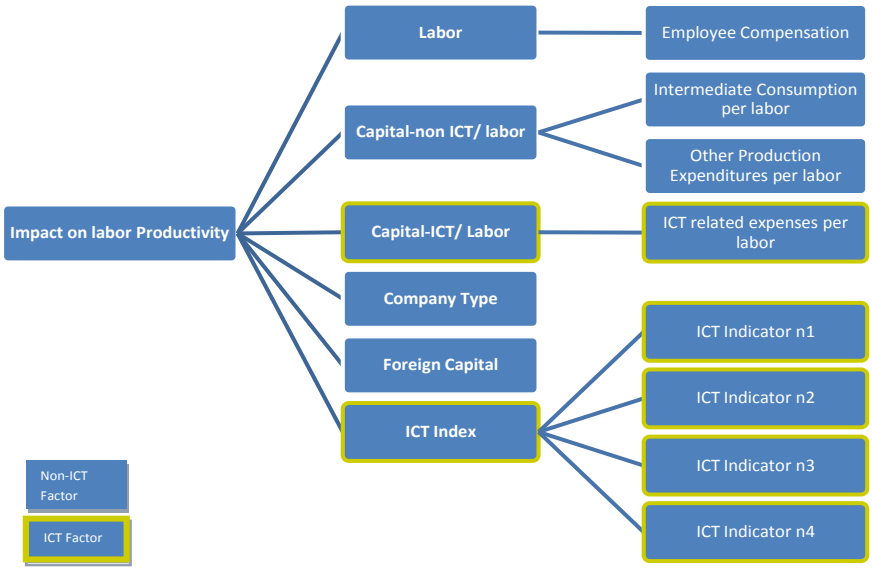


Figure 14: Impact on labor Productivity Factors

The regression equation took the following form:

$$LP= \beta_0+\beta_1 Labor+\beta_2(K)_{ict}/L+\beta_3(K)_{non\ ict}/L+\beta_4 FK+\beta_5 comp+\beta_6 ICT+€$$

Where:

LP: Labor productivity

(K) non-ICT/L: Capital-Non-ICT per Labor (Non-ICT capital intensity to Labor)

(K) ICT/L: Capital-ICT per Labor (ICT capital intensity to Labor)

FK: Foreign Capital

Comp: Company Type

ICT: ICT – Index indicator

€: error term

7.4 Employment:

The general literature on the relationship between ICT and changes in employment and productivity notes that it is difficult to define and isolate a direct relationship between these variables, and that the impacts depend on the industry structure and the ways ICT is used within the industry.

- The ICT impact on **Employment** was assessed by measuring the number of people performing a service for monetary compensation (direct, indirect and induced).

ICT Impact on Employment= Direct employment + indirect employment + induced employment

* Direct employment: Jobs belong to the ICT sector.

* Indirect employment: jobs created in other sectors through the ICT sector's consumption
* Induced employment: jobs generated by the increased economic activities from the sector's employees

7.5 Female gender aspect:

- The ICT impact on **Female Gender Aspect** was assessed by calculating the correlation between the diffusion of ICT in the sector represented by the developed ICT index and its sub-indices, and the percentage of female employees in the sector.

7.6 Taxation:

- The ICT impact on **Taxation** assessed by measuring the Indirect Taxation from additional profit, output and employment generated due to ICT influences on the sector, and the Induced Taxation due to induced employment.

8 ICT Impact Assessment Results

Impact Results:

The analyses have been prepared for all the 20 related activities on the micro level, in addition to the macro one.

Many approaches have been followed to check for the significance level to reach significant results:

The first one is the normal approach; which depends on regressing the values on the normal level (simultaneous figures for the variables have been used).

The second one is the lagged approach, in which dependent variables were regressed against the previous values of the independent variables; this approach is normally used for the variables that require more than one period to create an impact, and sometimes the impact takes a period equals to one year, other times two years or more are required, this is based on the nature of the variable and the impact magnitude it creates.

The third approach is applied by taking the natural logarithm for all the variables under regression; in this case, the value of the parameter indicates the percentage change in the dependent variable due to a percentage change in the independent one.

The fourth approach is applied by performing some amendments to the model represented by restricting the variables entering the model.

The normal approach provided a wider area of significant results.

As mentioned previously, variables were grouped into ICT related variables and non-ICT related variable, the ICT variables are: ICT capital and the ICT index. Most important is to check for the significance existence then to check for the impact size.

Regression analyses were applied by using the proper analysis tool and the corresponding significance level is considered to be 5% (as commonly used)

Analyses results:

Applying the regression results and calculating the figures for the year 2008 led to the following findings. These results will be shown for the activities themselves and then the whole sector.

8.1 Activity 7010: Real estate activities with own or leased property

8.1.1 Impact on productivity:

Applying the regression analyses for this activity show that, the only significant result was for the ICT index whereas the ICT capital results were insignificant. The standardized coefficient for ICT shows the amount of 66.3%, explicitly speaking; around 66% of the change in the activity's gross output is due to the ICT diffusion. This relatively high result could be explained by the ICT diffusion and

deployment in the activity, not to miss that the impact of ICT on services -offering sectors are higher than the commodity offering ones.

This result seems to be logical if we consider that productivity in this field measured by increase in transactions due to the increase in ICT tools; since satisfying client needs requires more use of PCs, systems, internet and call centers. These tools facilitate the connection process between the two sides of the market (demand and supply) and provide a wider room for creating more revenues by using advanced management systems.

To prove this, "the ICT use in enterprises" survey (previously mentioned as the main source for building this index) shows some interesting results for this activity: as 44 % for the enterprises working within this activity own internet line; this ratio is considered high, 26% of them have a web site which is something necessary for this activity.

More than the half of the firms is using PCs on daily basis (56%) of the total firms working within this activity, and (on average) 87% of computers are connected to the internet in the activity.

8.1.2 Impact on labor productivity:

Results for the labor productivity in this activity show insignificant results for the ICT capital and the ICT index, although the impact on productivity should be reflected on labour productivity, but the direct impact on the latter didn't appear significant.

8.1.3 Impact on taxation:

Regarding the impact of ICT on taxes collected from this activity as a result of ICT use, the results show that the impact magnitude exceeded the amount of JD 1 million for the year 2008. The highest value for the impact on taxation was from the employee's income taxes, then from the sales tax, the corporate income taxes were the least between the group.

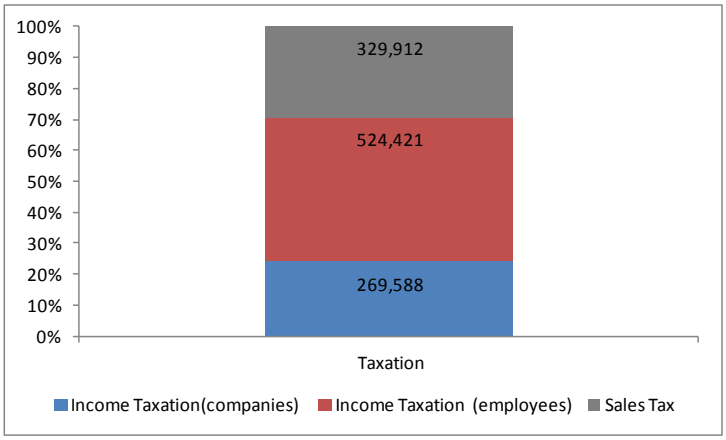


Figure (15): Impact on Taxation (Activity 7010)

8.1.4 Impact on Employment:

Regarding the impact on employment, the results indicate that the use of ICT in this activity can create around 74 employees as indirect employment (which mainly come from the impact of ICT on increasing the gross output in the activity), for the induced employment, the results show no considerable values.

As for the direct ICT employees working in this activity, data was not available, accordingly the analysis show the indirect and induced figures only (when available).

8.1.5 ICT Impact on Female Gender Aspect

Within the workforce per se, the ICT sector has a large impact on gender balance. De facto; ICT reduces the need for physical labor and creates more jobs. Women, therefore, would find better employment prospects due to the diffusion of ICT, especially within the high-tech activities.

The impact on female employment is measured by trying to capture if the diffusion of ICT into the workplace has affected the female employment ratio. To capture this, a simple correlation factor has been calculated between the percentages of female employees and diffusion of ICT on activity level. In 2008, the correlation stood at a very small value of 0.07 indicating a weak or almost no correlation, this result is considered to be logical if we know the female participation ratio in this activity which was only 8%.

*(The value of correlation factor lies in the range between (-1: means high correlation but in the opposite direction) and (1: high positive correlation); the nearer to 1; the stronger the relationship is, while zero value indicates no correlation between the variables).

8.2 Activity 7020: Real estate activities on a fee or contract basis

8.2.1 Impact on productivity:

Applying the regression analyses for this activity show similar results for the previously mentioned activity; the only significant result was for the ICT index, whereas the ICT capital results were insignificant. The standardized coefficient for ICT shows the amount of 55%, explicitly speaking; around 55% of the change in gross output in this activity is due to the ICT diffusion, This relatively high result could be explained by the ICT diffusion and deployment in the activity, 60% of the firms working under this activity are using computers for the daily work, similar ratio was for the ones having internet line and on average 78% of the computers are connected to the internet.

8.2.2 Impact on labor productivity:

Results for the labor productivity in this activity didn't show significant results – as for the pervious activity- neither for the ICT capital nor to ICT index.

8.2.3 Taxation:

As for the taxation figures, ICT affect taxes collected from this activity by more than JD 200,000. The highest amount came from the sales tax (around three quarters), this high amount of sales tax is considered to be reasonable for such activity. The employees' income tax ranked the second whereas the lowest were for the companies' income tax.

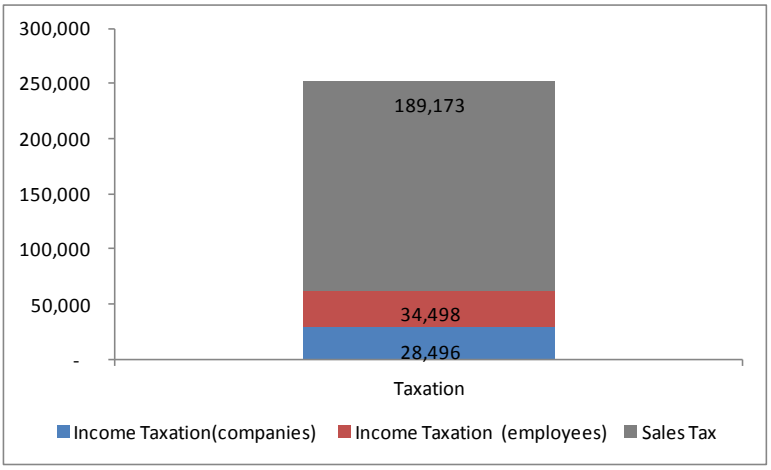


Figure (16): Impact on Taxations (7020)

Source: calculated based on ISTD figures.

8.2.4 Empolyment:

For the employment figures, the total impact of ICT on employment opportunities reached the value of 56 employees, all are indirect opportunities.

8.2.5 Female gender:

The correlation factor for this activity shows a weak correletion factor of around 0.18, this result is considered to be logical as the female participation ratio in this activity was only 14%.

8.3 Activity 7122: Renting of construction and civil engineering machinery and equipment, 7129: Renting of other machinery and equipment n.e.c.

Regression analyses for this activity show no significant results; neither for the productivity nor for the labour productivity, accordingly we cannot measure the impact on both taxation and employment. Same thing is applied for the activity 7129:

8.4 Activity 7130: Renting of personal and household goods n.e.c.

8.4.1 Impact on productivity:

Applying the regression analyses for this activity shows that the only significant result was for the ICT index, while the ICT capital results were insignificant.

The standardized coefficient for ICT shows the amount of 18.6%, explicitly speaking; around 19% of the change in gross output is due to the ICT diffusion in this activity.

8.4.2 Impact on labor productivity:

Results for the labor productivity in this activity show relatively high significant results reached to 41.9%, all came from the ICT index.

8.4.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity as a result of ICT use, the results show that the impact magnitude exceeded JD (14,000) for the year 2008. More than 80% of them are collected from employee's income taxes.

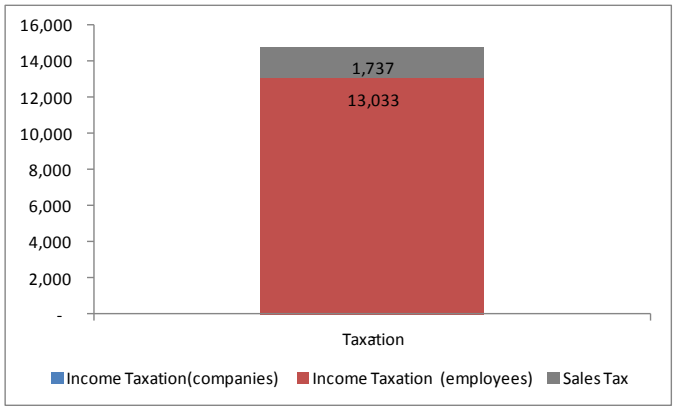


Figure (17): Impact on Taxation (Activity 7130)

8.4.4 Impact on Employment:

Regarding the impact on employment, the results indicate that the use of ICT in this activity can create around 92 employees as indirect employment , for induced employment, the results show no considerable values.

8.4.5 ICT Impact on Female Gender Aspect

The correlation stood at a value of 0.49 indicating a moderate correlation, this result indicates that increasing the ICT diffusion in this activity may allow more women to be included in this activity's workforce but moderately.

8.5 Activity 7310: Research and experimental development on natural sciences and engineering (NSE).

8.5.1 Impact on productivity:

The story in this activity is different; regression analyses show a significant result for the ICT capital and not for the ICT index. This could be due to the need for ICT investment in this activity, 17.5% was the impact size.

8.5.2 Impact on labor productivity:

Results for the labor productivity in this activity were consistent with the productivity value but different in the source, the impact size reached 17.1% on labour productivity; came all from the ICT index.

8.5.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity as a result of ICT use, the results show that the impact magnitude was around JD 13,000. More than the half of them came from the employees income taxes, sales ranked the second whereas the least was for the firms' income tax.

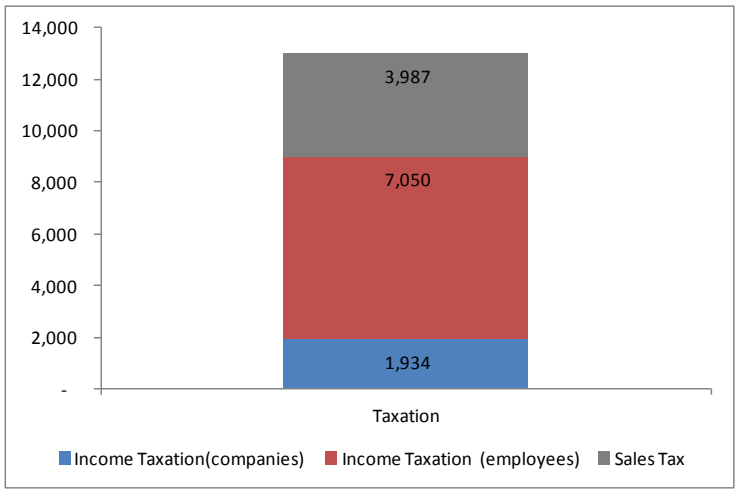


Figure (18): Impact on Taxation (Activity 7010)

8.5.4 Impact on Employment:

Regarding the impact on employment, the results indicate that the use of ICT in this activity can create around 28 opportunities as indirect employment.

8.5.5 ICT Impact on Female Gender Aspect

The correlation stood at a relatively high value of 0.64 indicating a semi-strong relationship between the ICT diffusion and the female participation. The percentage of female workers in this activity reached more than 60% of the total employees working in this activity.

8.6 Activity: 7411 Legal activities

8.6.1 Impact on productivity and Labour productivity:

Applying the regression analyses for this activity didn't show any significant result for productivity nor for labour productivity.

Although that 80% of the firms use computers for the daily work, only 24% of the total firms are having an internet line. It seems that the legal offices don't depend on internet for their transactions and connections as they depend heavily on paper work due to the nature of this activity which requires more official letters/documentation.

8.6.2 ICT Impact on Female Gender Aspect

The correlation stood at a moderate level of 0.42 indicating a moderate correlation between the ICT diffusion and the women participation in the labour force.

8.7 Activity 7412: Accounting, book-keeping and auditing activities; tax consultancy

8.7.1 Impact on productivity:

Applying regression analyses for this activity show positive and significant results for both the ICT capital and index. The impact on the former was higher indicating the need for ICT tools.

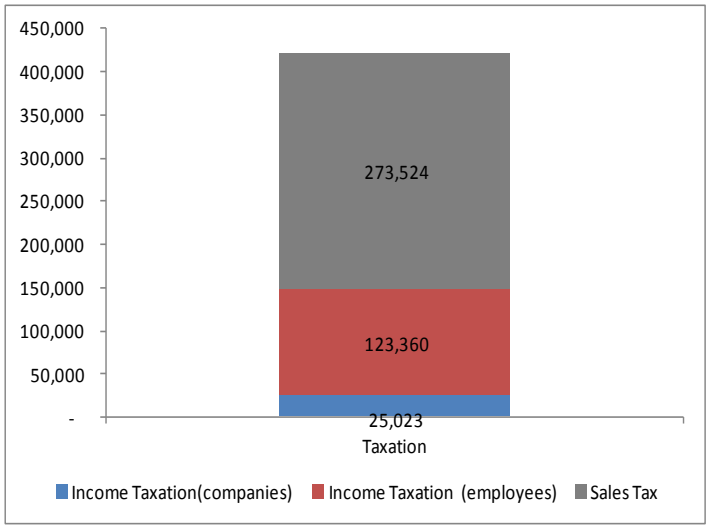
The standardized coefficient for the ICT capital shows a value of 38% and 6% for the index.

8.7.2 Impact on labor productivity:

Unfortunately, the impact on labor productivity in this activity was insignificant for the capital and index.

8.7.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity as a result of ICT use, the results show that the impact magnitude was around JD 422,000. More than 60% of them came from the sales tax, employees income taxes ranked the second and the firms' were the least.



Figure(19): ICT Impact on taxation (7412)

8.7.4 Impact on Employment:

Regarding the impact on employment, the results indicate that the use of ICT in this activity can create around 155 opportunities in the form of indirect employment.

8.7.5 ICT Impact on Female Gender Aspect

The correlation stood at a relatively high value of 0.75 indicating a strong relationship between the ICT diffusion and the female participation. although the percentage of female workers in this activity didn't exceed 24% of the labour force, it could be increased by the ICT diffusion in future.

8.8 Activity 7413: Market research and public opinion polling

8.8.1 Impact on productivity:

Applying regression analyses for this activity show positive and significant results for both the ICT capital and index, but the majority of the impact size came from the former (48.8%) and a tiny amount for the latter 0.6%.

8.8.2 Impact on labor productivity:

Unfortunately, the impact on labor productivity in this activity was insignificant for the capital nor for the index.

8.8.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity, it couldn't be measured due to the non availability of data.

8.8.4 Impact on Employment:

Applying ICT in this activity can stimulate around 177 opportunities, all as indirect ones.

8.8.5 ICT Impact on Female Gender Aspect

The correlation stood at a moderate value of 0.54 indicating a moderate relationship between the ICT diffusion and the female participation which reached 41% of the activity's labour force.

8.9 Activity 7414: Business and management consultancy activities

8.9.1 Impact on productivity:

Applying regression analyses show a significant result for the ICT capital and not for the ICT index. This could be due to the need for ICT capital in this activity, 46.5% was the impact size.

8.9.2 Impact on labor productivity:

The impact size of ICT diffusion on labor productivity in this activity wasn't huge, the value didn't exceed 9% came from the ICT index.

8.9.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity as a result of ICT diffusion and use, the results show that the impact magnitude was around JD 180,000, 70% of them came from the sales tax, around a quarter of them came from the firms' income tax.

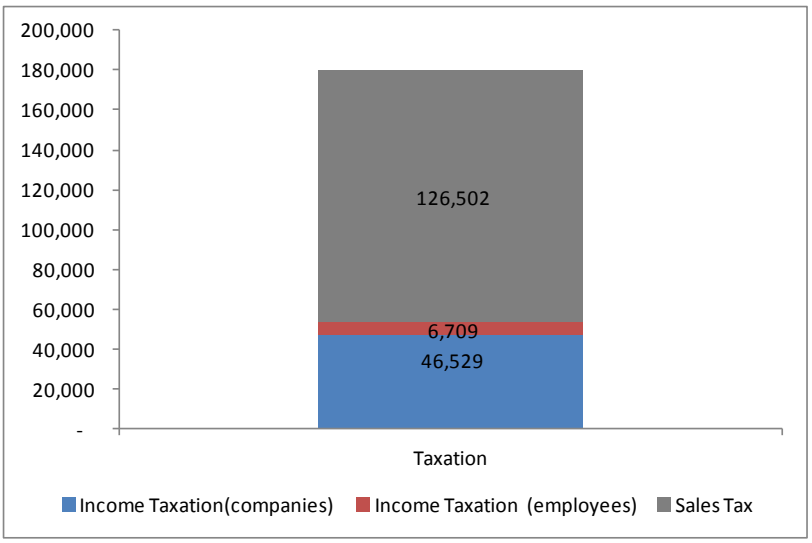


Figure (20) imact on taxation (activity (7414))

8.9.4 Impact on Employment:

Because the impact size of ICT on labour productivity was small, the impact size on employment was also small. The stimulated opportunities were only 6 came as indirect ones.

8.9.5ICT Impact on Female Gender Aspect

The correlation stood at a very small-negative value of (-0.04) indicating a small negative relationship, to investigate this relation; the author reached to a fluctuating trend of females' employment in this activity which caused this negative sign as shown below.

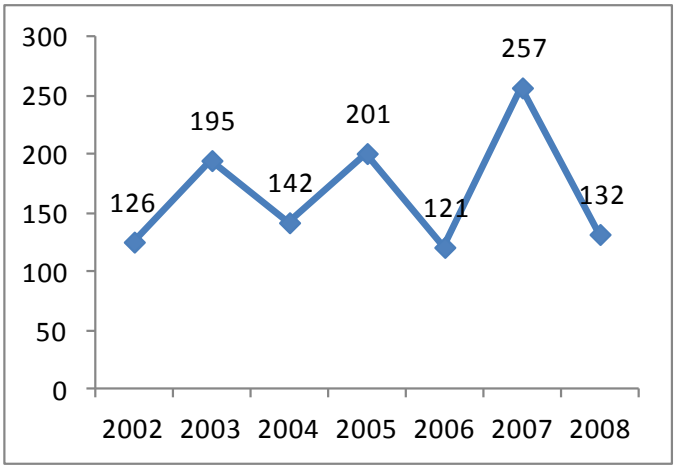


Figure (21) Females in Labour Force (7414)

Source: DoS, Economic Survey

8.10 Activity 7421: Architectural and engineering activities and related technical consultancy

8.10.1 Impact on productivity:

Applying regression analyses for this activity show positive and significant results came from the ICT index, the impact size reached the value of (12.9%).

8.10.2 Impact on labor productivity:

The impact on labor productivity in this activity reached the amount of 14.3% also came from the ICT index.

8.10.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity, the taxes reached around 200,000, the majority came from the sales tax.

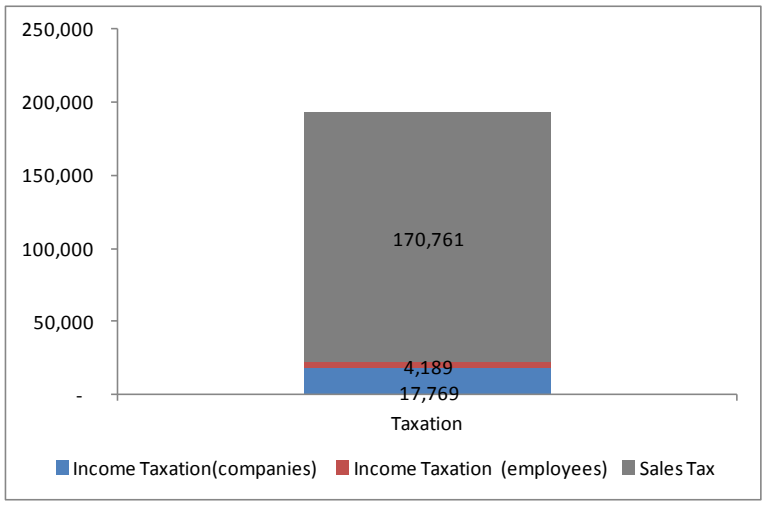


Figure (22): impact on taxation (7421)

8.10.4 Impact on Employment:

The impact of ICT on employment was very small, could be neglected.

8.10.5 ICT Impact on Female Gender Aspect

The correlation stood at a good value of 0.64 indicating a good relationship between the ICT diffusion and the female participation which reached 29% of the activity's labour force.

8.11 Activity 7430: Advertisement

8.11.1 Impact on productivity:

Applying regression analyses for this activity show positive and significant results came from the ICT index, the impact size reached the value of (10.3%).

8.11.2 Impact on labor productivity:

The impact on labor productivity in this activity reached the value of 1538% also came from the ICT index.

8.11.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity, the taxes amount exceeded JD 200,000; the majority came from the sales tax.

8.11.4 Impact on Employment:

The impact of ICT on employment was very small, leads us to neglect it.

8.11.5 ICT Impact on Female Gender Aspect

The correlation stood at a value tends to zero indicating no correlation between the ICT diffusion and the female participation which didn't exceed 16% of the activity's labour force.

8.12 Activity 7941: Labour recruitment and provision of personnel

8.12.1 Impact on productivity:

Applying regression analyses for this activity show positive and significant results came from the ICT capital, the impact size reached the value of (41.5%).

8.12.2 Impact on labor productivity:

The impact results on labor productivity in this activity show a very small value of around 1% only came from the ICT index.

8.12.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity, the taxes amount didn't exceed JD 9,000 came mainly from the income taxes of the employees.

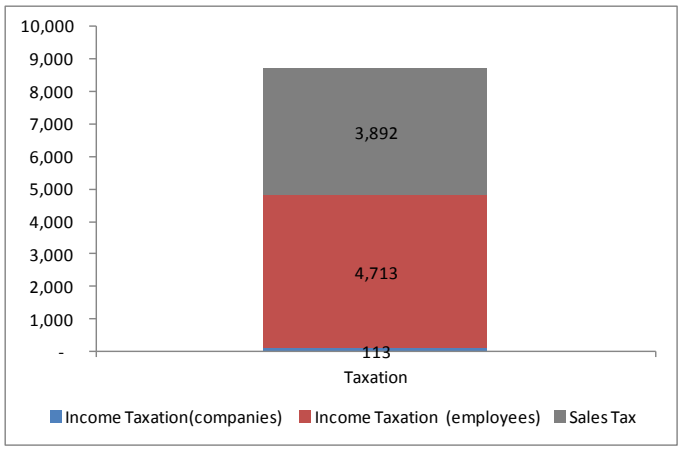


Figure (23): impact on taxation (7491)

8.12.4 Impact on Employment:

The impact of ICT on employment was very small due to the small impact on labour productivity; it didn't exceed 12 indirect opportunities.

8.12.5 ICT Impact on Female Gender Aspect

The correlation stood at a very small -negative value tends to zero indicating no correlation between the ICT diffusion in this activity and the female participation.

8.13 Activity 7492: Investigation and security activities

8.13.1 Impact on productivity:

Applying regression analyses for this activity didn't show any significant results.

8.13.2 Impact on labor productivity:

The story is different for the impact on labor productivity; in this activity the impact value reached the amount of 20.8% came from the ICT index.

8.13.3 Impact on taxation:

Regarding the impact of ICT on taxation collected from this activity, the taxes reached JD 41,220 all are came from the income taxes collected from the employees.

8.13.4 Impact on Employment:

The impact of ICT on employment was relatively large due to the high impact on labour productivity; applying ICT in this activity can feed the economy with around 521 indirect opportunities.

8.13.5 ICT Impact on Female Gender Aspect

Due to the activity's male-intensive workforce; the correlation stood at a small value of round 0.10 only.

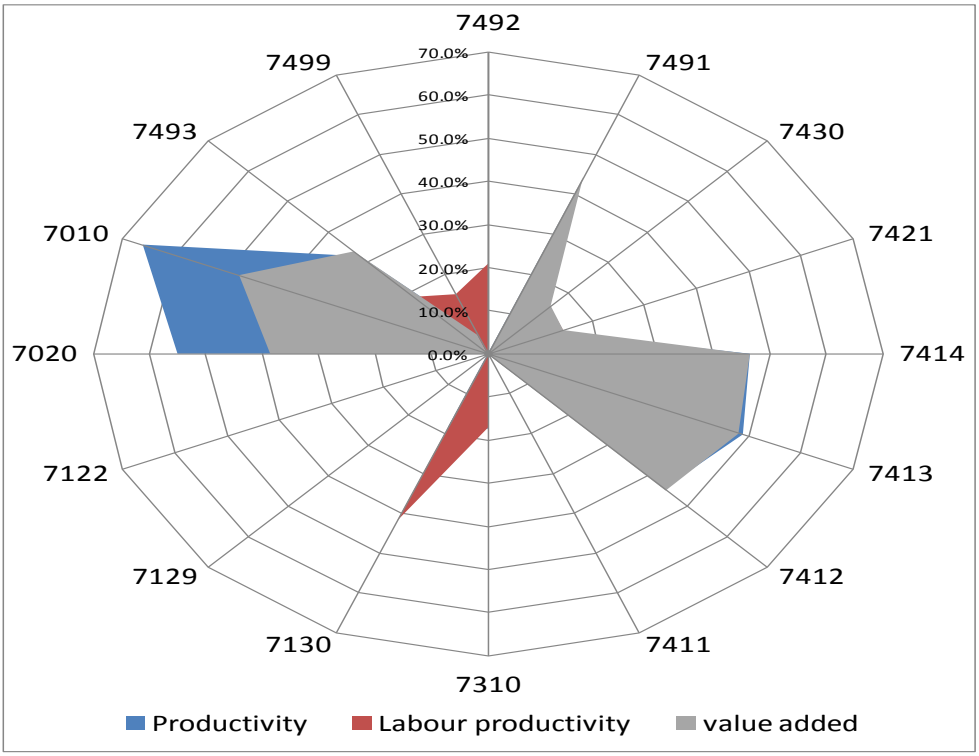


Figure (24): the summary of ICT impact on real estate sector's activities.

Source: prepared by the author based on the analysis results.

Figure above summarizes the impact results for all of the activities and the three aspects; the highest impact on productivity was on the activity 7010, on labour productivity was on 7130 and in terms of values added was on 7413.

8.14 Sector Analyses:

This section tackles the impact of ICT on the sector (macro level), all the previously mentioned aspects have been applied to the sector's variables in order to test for the impact of ICT on all the activities as a group by Following the same approach and model, the following results were obtained for the year 2008.

Before representing the results, it's worth mentioning the following points:

- It's probable to have different results for applying the regression analysis on macro (sector) level and applying it on activity level (in value and/or direction) due to the statistical nature of the numbers.
- De facto, some data were not available on activity per se (such as the consumption/ expenditure of ICT sector on other sectors) but it is available on the sector's, this type of data mainly affect the employment results; so the value of the activities' employment will not sum up to the gross total of the sector .

8.14.1 Productivity:

Regression results on the sector level show a positive impact of ICT, both ICT index and ICT capital were statistically significant, but the majority of the impact came from the ICT capital. The aggregate impact ratio reached 37.2%; 33.1% comes from the ICT capital while the remaining 4.2% came from the ICT index.

The sector aggregate impact means that ICT is the responsible for 37% of the total change in sector's productivity.

8.14.2 Labor Productivity:

For the labor productivity impact, results show a significant impact represented by the ICT index, impact ratio reached 28.7%. Accordingly; ICT diffusion in this sector is responsible for 28.7% change in the labor productivity.

8.14.3 Taxation:

The total impact of ICT on the collected taxes from the sector is represented by the sum of all impact results on the sector's related activities.

The aggregate impact reached the amount of around JD 2.5 million. More than the half came from the sales tax, 30% came from employees- income tax and the least from the income tax of the firms.

8.14.4 Employment:

The diffusion of ICT in real estate sector helped at creating more than 8,500 job opportunities (as indirect ones).

8.14.5 Female Gender Aspect:

Results don't show a strong correlation between the ICT index and female ratio employed in real estate sector. The correlation factor reached the amount of 0.51. The female participation ratio didn't exceed 20% of the total employees working in the sector for the year 2008.

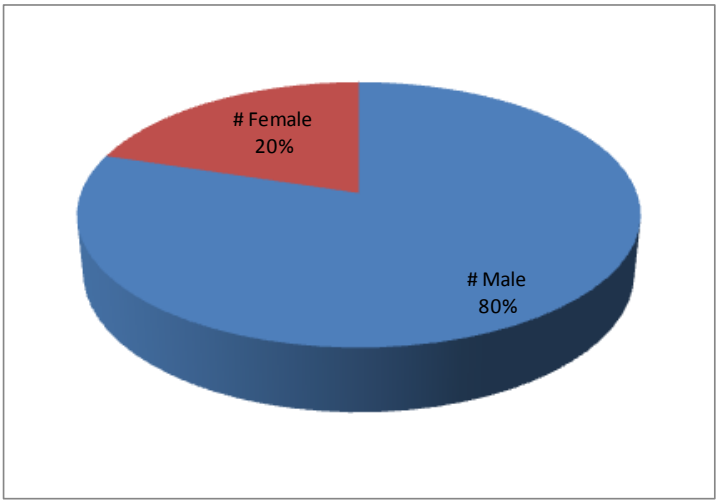


Figure (25): Percentage of sector's Employees according to the sex.

Data Source: DoS, Economic Survey.

8.14.6 Value Added:

Finally and most importantly; testing for the ICT impact on the sector's participation to GDP, this impact could be measured through the change in value added in the sector caused by ICT diffusion and use.

Testing for the impact of ICT in terms of value added was performed for the aggregate level (sector level) not the activity level aiming to look at the macro level.

Modification has been performed to the productivity aspect by replacing the gross output variable by the value added for the sector, then regressing the latter against the ICT variables.

The results were significant for both ICT index and ICT capital. The aggregate impact on the sector was around 41%; 38% came from the ICT capital while the 3% came from ICT index.

This means ICT diffusion and expenditure were responsible for 41% of the change in the value added of the sector. Applying this impact ratio for 2008 figures, shows the amount of JD 13.2 million representing around 0.08% from the total GDP for the year 2008.*

(* Based on DoS figures, GDP for the year 2008 stood at the level of JD ≃16 billion)

Relooking at the previous analyses, it can be assumed that the actual impact of ICT on real estate sector could be higher due to the following reasons:

1. The scarcity of data, especially for some important indicators covering some of the aspects; such as the number of ICT experts working in the sector in addition to the lack of the main economic indicators on the activity level.

2. Scarcity of detailed indicators in the sector; ICT may have an impact on innovation, cost saving and environmental aspects which could be covered in detailed surveys or a stand-alone survey.

9 Study Limitations

The limitations this study has faced starting the initial phase till reaching the results are summarized in the following points:

1. **Data Limitation**

Data limitations represented by the lack of data in addition to insufficient and inconsistent available data; The regression analyses were prepared for the period (1994-2008), this in return affected the regression results and the accuracy level of the study, which could be improved when more time series points are available.

- Some data were inconsistent when taken from more than one source. This affected the calculation approaches the study depended on and then the accuracy level.
- Moreover, some detailed figures were not available on the activity level, which required replacing them by other variables or searching for suitable ways to estimate and separate them, this may have affected the results accuracy, especially when data was available for just one point.
- Different methodologies and classification other data sources use led to some illogical results in the econometric analyses resulting in less/ insignificant results.

2. **Financial limitation:**

This study could be performed better when more financial resources are available in order to cover the most important data gaps this study suffers; by having a proper fund; more detailed surveys could be conducted, so more data points could be covered.

10 Recommendations

Based on the results of this study and the limitation it suffered from, the following is recommended:

1. More collaboration is needed between the stakeholders and the data providers to overcome the previously mentioned data problems.
2. There is a need for a well-structured Information System or Intelligent System technologies to facilitate work progress leading to enhance the productivity and labour productivity in the sector and the related activities.
3. Increase ICT awareness in economic sectors to utilize the positive impact the ICT creates in the different sectors through the different influence channels; (the ICT related variables). Work with sectors' formal representatives to ensure having ICT related objectives in their Business strategies to develop and enhance their sectors, as these objectives shall become strategic goals for their ICT strategies. Thus achieving ICT goals will show and create direct impact on achieving business objectives.
4. Promote transforming ICT from being a cost center in any enterprise into becoming an enabler, through the required linkage between the ICT and the value chain analysis.
5. Detailed input-output matrix is needed in order to facilitate the data collection process and prepare the proper microeconomic analyses.
6. Unify the classification used in the different data sources, on national level, in order to remove any contradiction in data, and hence improve study results' accuracy.
7. Moving toward advanced econometric tools, especially time series analysis to achieve the "best-fitness" of the economic models.

11 Appendix 1, ISIC explanation notes (United Nations Statistics Division)

Class: 7010 - Real estate activities with own or leased property

Explanatory note

This class includes buying, selling, renting and operating of self-owned or leased real estate such as apartment buildings and dwellings, non-residential buildings; developing and subdividing real estate into lots, etc. Also included are development and sale of lands, operating of apartment hotels and residential mobile home sites.

Exclusions: Development on own account involving construction is classified in class 4520 (Building of complete constructions or parts thereof; civil engineering).

The operation of hotels, rooming houses, camps, trailer camps and other short-term lodging places is classified in class 5510 (Hotels; camping sites and other provision of short-stay accommodation

Class: 7020 - Real estate activities on a fee or contract basis

This class includes buying, selling, renting, managing and appraising real estate on a fee or contract basis

Class: 7121 - Renting of agricultural machinery and equipment

This class includes the renting of agricultural and forestry machinery and equipment without operator.

Exclusions: Renting of this machinery or equipment with operators is classified in class 0140 (Agricultural and animal husbandry service activities, except veterinary activities).

Financial leasing is classified in class 6591.

Class: 7122 - Renting of construction and civil engineering machinery and equipment

This class includes the renting of construction and civil engineering machinery and equipment (including crane lorries) without operator.

Exclusions: Renting of this machinery or equipment with operators is classified in class 4550 (Renting of construction or demolition equipment with operator).

Financial leasing is classified in class 6591.

Class: 7123 - Renting of office machinery and equipment (including computers)

This class includes the renting of all kinds of office machinery and equipment, such as duplicating machines, typewriters and word processing machines; of accounting machinery and equipment, such as electronic calculating machines, cash registers and other machines incorporating a calculating device; and of computing machinery and equipment, such as automatic data processing machines of the digital, analogue or hybrid type, central processing units, peripheral units and magnetic or optical readers, without management or operation.

Class: 7129 - Renting of other machinery and equipment n.e.c.

This class includes the renting of all kinds of machinery, electrical or not, which is generally used as capital goods by industries, such as engines and turbines, machine tools, mining and oil field equipment, commercial, radio, television and communication equipment, professional, scientific, measuring and controlling and other commercial and industrial machinery and rental of motion picture production equipment.

Exclusions: Financial leasing is classified in class 6591.

Renting of agricultural machinery and equipment is classified in class 7121.

Renting of construction and civil engineering machinery and equipment is classified in class 7122.

Renting of office machinery and equipment (including computers) is classified in class 7123.

Class: 7130 - Renting of personal and household goods n.e.c.

This class includes the renting of all kinds of personal and household goods, whether the customers are households or industries. It involves the renting of such goods as textiles, wearing apparel and footwear, furniture, pottery and glass, kitchen and tableware, electrical appliances and housewares, bicycles, (water) sports equipment, jewellery, musical instruments, scenery and costumes, books, journals and magazines, video tapes and records, etc. Also included is general goods renting.

Exclusions: Renting without operator of passenger cars and vans, motorcycles, caravans and trailers is classified in class 7111 (Renting of land transport equipment).

Renting of leisure and pleasure equipment can also be undertaken by the recreational industries and is then classified in the appropriate class of division 92 (Recreational, cultural and sporting activities).

Class: 7310 - Research and experimental development on natural sciences and engineering (NSE)

This class includes systematic creative work in the three types of activities in the field of research and development defined above, in natural sciences (mathematics, physics, astronomy, chemistry, life sciences not elsewhere classified, earth sciences, etc.), medical sciences, agriculture, and engineering and technology. They are intended to increase the stock of knowledge and to devise new applications.

Class: 7320 - Research and experimental development on social sciences and humanities (SSH)

This class includes systematic creative work in the two types of activities in the field of research and development defined above, in social sciences (economics, psychology, sociology, legal sciences, etc.) and humanities (e.g. linguistics and languages, arts). They are intended to increase the stock of knowledge and to devise new applications.

Exclusion: Market research is classified in class 7413.

Class: 7411 - Legal activities

This class includes advise and representation in civil, criminal and other cases, i.e. representation of one party's interest against another party, whether or not before courts or other judicial bodies. These activities are generally performed by, or under supervision of, persons who are members of the bar. Civil cases involve infringements of an individual's or corporate's private or civil rights such as liability cases, divorce cases, etc. Criminal actions are cases involving offences against the state and are usually instigated by the government. Provision of advice in connection with labour disputes, general counseling and advising, preparation of legal documents which do not directly involve a legal suit or which are related to articles of incorporation, partnership agreements or similar documents in connection with company formation. Also included are activities in connection with patents and copyrights, with the preparation of deeds, wills, trusts, etc., and the activities of notary public, arbitrators, examiners and referees.

Exclusions: Law court activities are classified in class 7523 (Public order and safety activities).

Class: 7412 - Accounting, book-keeping and auditing activities; tax consultancy

This class includes activities involving the recording of commercial transactions for businesses or others, the preparation of financial accounts, the examination of these accounts and the certification of their accuracy and the preparation of personal and business income tax returns.

Included are related advisory activities and representation (other than legal representation) on behalf of clients before tax authorities.

Exclusions: Data processing and tabulation activities are classified in class 7230 (Data processing).

Activities involving management consultancy, by units that do not provide accounting or auditing services, e.g. design of accounting systems, cost accounting programmes, budgetary control procedures, etc., are classified in class 7414 (Business and management consultancy activities).

Bill collection is classified in class 7499 (Other business activities n.e.c.).

Class: 7413 - Market research and public opinion polling

This class includes investigation on market potential, acceptance, and familiarity of products and buying habits of consumers for the purpose of sales promotion and development of new products, and investigation on collective opinions of the public about political, economic and social issues.

Class: 7414 - Business and management consultancy activities

This class includes the provision of advice, guidance or operational assistance to businesses. These activities involve public relations, e.g. through image building and opinion moulding, to improve the relations of the client with the public, the media or others, other than by paid advertisements, welfare and charity affairs, politics, lobbying. Activities in connection with planning, organization, efficiency and control, management information, etc.; combined management consultancy and actual management, e.g. by agronomists and agricultural economists to farms, etc.

Also included are activities of management holding companies.

Exclusions: Computer activities are classified in division 72.

Legal advise and representation are classified in class 7411 (Legal activities).

Accounting, book-keeping and auditing activities and tax consultancy are classified in class 7412.

Market research and public opinion polling are classified in class 7413.

Technical advisory activities are classified in class 7421 (Architectural and engineering activities and related technical consultancy).

Advertising activities are classified in class 7430.

12 References:

- AL Ahli investment, (2009): Jordan Real Estate sector report.
- CBJ, annual reports: http://www.cbj.gov.jo/pages.php?menu_id=12&local_type=0&local_id=0&local_details=0&local_details1=0&localsite_branchname=CBJ
- CBJ, yearly statistical series, ww.cbj.gov.jo/pages.php?menu_id=136&local_type=0&local_id=0&local_details=0&local_details1=0&localsite_branchname=CBJ
- Dixon, T, (2005), **Connectivity, Technological Change and Commercial Property in the New Economy: A New Research Agenda**, College of Estate Management.
- Dos, Web published data, http://www.dos.gov.jo
- Global Investment House.(2008): Jordan Real Estate Sector, Thriving on growth ...
- http://unstats.un.org
- Jordan investment Board, http://www.jordaninvestment.com
- Khammash, T and ALkhas, Z. (2009) Real Estate Sector Report, ABC investments group.
- Khammash, T and tawfiq, A. (2007) Real Estate Sector Report, ABC investments.
- Kim, D. (2009): **Korean Experience of Overcoming Economic Crisis through ICT Development**, ESCAP Technical Paper.
- Moon, S. Kim, Y and Hong, D, the **Economic importance of information and communications technology industry in Korea: A CGE approach.**
- OECD. (2003): **ICT and Economic Growth**, evidence from OECD countries, industries and firms.
- Sunnuqrot, S. Touqan, T. Juma, et al. (201?) :The Real Estate Sector, Ahli Investment Banking
- NCHRD, web statistics, http://www.almanar.jo.