



وزارة الإتصالات و تكنولوجيا المعلومات

Ministry of Information and  
Communications Technology

# Assessment of the Economic Impact of ICT on Tourism Sector:

The case of Jordan

---

## Project Analysis Report

[July, 2010]

Policies and Strategies Directorate  
Economic Section

## ACKNOWLEDGEMENTS

This study could not be possible without the support and cooperation with many parties. The team would like to thank first, His Excellency the Minister of Information and Communications Technology for the respectful concern and support this project has gained from him.

The team would also like to extend the special thanks to 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. The team is indebted to both Ministry of tourism and antiquities (MoTA) and Jordan tourism board (JTB) for the fruitful participation in the specialized committee. Thanks are also extended for the ministry of transportation and Y-consult team for the kind support in answering the team queries. Special thanks for colleagues in MOICT for their support, creative ideas and the review for project deliverables.

## 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 Tourism sector 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 project team managed to develop a valuable tool that is robust yet flexible enough to accommodate the rapid developments in ICT technologies.

According to the study outcomes, ICT sector has a positive impact on tourism in terms of employment, taxation, productivity, labor productivity and value added.

Accordingly, Jordan can gain benefits from applying periodic comprehensive ICT impact assessments, as the outcomes will help policy makers 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.

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

1	Introduction.....	6
2	Study Approach .....	7
3	Tourism industry.....	10
	International Labor Organization (ILO) Definition .....	10
	UNWTO Definition .....	10
4	ICT in tourism:.....	13
5	The importance of tourism in Jordan: .....	15
	Sales tax:.....	18
	Income tax: .....	19
	Employees Income Tax .....	20
6	ICT Impact Model Overview .....	22
7	ICT Impact Assessment Results .....	26
7.1	Activity 5510: Hotels; Camping Sites and Other provision of Short-Stay Accommodation:.....	26
7.2	Activity 5520: Restaurants, Bars and Canteens: .....	28
7.3	Activity 6010: Transport via Railways: .....	30
7.4	Activity 6021 and 6022: Other Scheduled Passenger Land Transport and Other Non-Scheduled Passenger Land Transport: .....	31
7.5	Activity 6110: Sea and Coastal Water Transport .....	32
7.6	Activity 6210 and 6220: Scheduled Air Transport and Non-Scheduled Air Transport:.....	34
7.6.3	Taxation: .....	34
7.7	Activity 6304: Activities of Travel Agencies and Tour Operators; Tourist Assistance Activities n.e.c. .	35
7.8	Activity 7111: Renting of Land Transport Equipment:.....	37
7.9	Activity 9219: Other Entertainment Activities n.e.c. ....	38
7.10	Activity 9241: Sporting Activities .....	40
7.11	Activity 9249: Other Recreational Activities: .....	41
7.12	Tourism Sector analysis: .....	43
8	Study Limitations .....	47
9	Recommendations.....	48
10	Appendix:1 .....	49
11	Appendix 3, ISIC explanation notes, (United Nations Statistics Division) .....	50
12	References: .....	55

## **List of Abbreviations:**

**CBJ:** central bank of Jordan

**DMS:** Destination Management Systems

**DoS:** Department of statistics

**GDS:** Global distribution systems

**GIS:** Geographic Information Systems

**GPS :** Global Positioning System

**ICT:** information and communication technologies.

**ISIC:** International Standard Industrial Classification.

**ISTD:** Income and Sales Tax Department

**JTB:** Jordan tourism Board.

**MoICT:** ministry of information and communications technology.

**MOTA:** Ministry of Tourism and antiquities

**NCHRD:** National Center for Human Resources Development

**UNWTO:** the World Tourism Organization

# 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.

This report tackles the subject of "Assessment of the Economic Impact of ICT on Tourism sector in The Hashemite Kingdom of Jordan" Project. Hence, key results were addressed in this report in order to ensure delivering a direct and clear message to concerned stakeholders.

this report provides a brief about the importance of ICT in tourism, 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 the 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 recommendations.

Although the project team faced different challenges to identify and assess the economic impact of ICT in Jordan, 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 tourism on the sector level as well as on the related activities' level,

This project is considered to be the second phase for 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.

Tourism sector has been chosen in this phase due to the following reasons:

- High importance of this sector to a small country such Jordan; stimulated from the participation to GDP, the employment figures, gross output, investment size..etc.
- The high required level of ICT diffusion in this sector due to the nature of the related activities and the type of the service they provide.
- Tourism sector doesn't serve the local demand only, but also the foreign one represented by the different types of consumption tourists expend on.

Based on the international definition of tourism, this sector doesn't constitute a separate one, it is considered as a combination of four economic sections according to the ISIC (International Standard Industrial classification) Revision 3.1, these sections are: 1) Hotels and restaurants. 2) Transport, storage and communications. 3) Real estate, renting and business activities. 4) Other community, social and personal service activities. So, by studying this sector, a wide extent of economic activities will be covered.

The corner stone of this project was finding an accurate definition for tourism sector due to the non availability of a clear definition based on ISIC Revision 3.1 which is the latest version of classification used by DoS (Department of Statistics); the official source of national statistics in Jordan and in this study as well. In an attempt to find a proper definition to the tourism sector, MoICT referred to international definitions; and the final outcome was the UNWTO (World Tourism Organization) definition. To ensure the suitability of this definition to Jordan; a specialized committee that constituted of experts from MoTA , JTB and MoICT was formed.

The next step was identifying and defining the aspects that will be tackled in this study which are: Productivity, labor productivity, impact on GDP, 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 (1994-2007), as the latest published figures for the economic survey by DoS are related to the year 2007. Descriptive analyses were based on actual data while in regression analysis the period was extended by adding estimates for the year 2008 based on historical trends for every singly variable.

Furthermore, 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 sector level and activity 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.

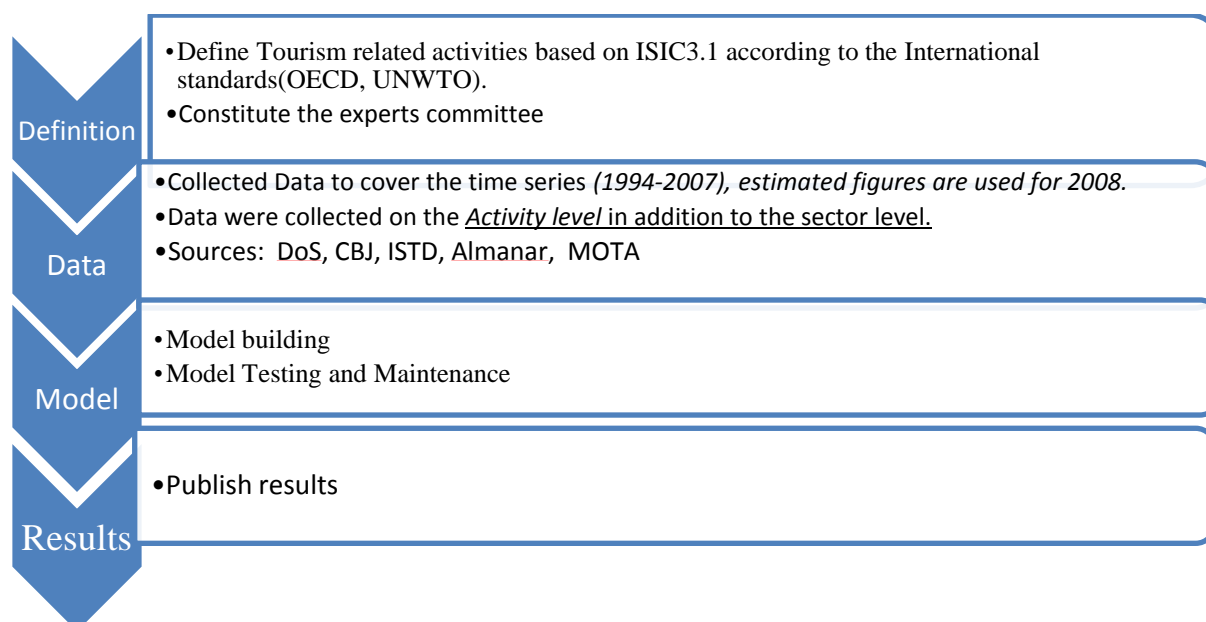
The model was built and rolled out on available data. Some of the data for certain aspects were unavailable, thus a multi-pronged approach to augment the model and close the data gaps was used through identifying a series of proxy indicators, and applying some estimation approaches based on the historical 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
- Outsourcing
- Urban/Rural Divide
- E-Government
- Environment
- Quality of Labor
- Flexibility of Employment
- Supply and Demand
- 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 (1994-2007). 2008 figures, as mentioned earlier, were estimated. The Main data sources for this project were: DoS, MoTA: (Ministry of Tourism and Antiquities), NCHRD (National Center for Human Resources Development) (ALmanar), CBJ and ISTD (Income and Sales Tax department)

### 3 Tourism industry

---

Tourism is currently one of the fastest growing industries across the world. It is primarily a service industry as it does not produce goods but renders services to various classes of people. It is a combination of various interrelated industries and trade like food industry, transport industry etc. It is a complicated business because it involves multiple socio-economic activities like attracting people to a destination, transporting them, housing, feeding and entertaining etc. In the process, it brings about tremendous infrastructural improvements and helps in the development of the region. Perhaps tourism is one such rare industry, which earns foreign exchange without exporting national wealth, tourism industry is currently an extremely sensitive hybrid industry and incorporates distinct features of information society. Although the core product in the industry is the physical service, which is produced and consumed in the physical world, it is dominated and achieved through information services. The perfect integration of information and physical services is the challenge for the contemporary tourism industry across the globe.

Many definitions for tourism have been used; the common thing between them all is that they define tourism as a combination of many sub- sectors integrating to constitute it.

#### **International Labor Organization (ILO) Definition**

The Hotel, Catering and Tourism (HCT) sector was defined by the ILO in 1980 in the framework of its sectoral activities. Most of the HCT enterprises fall under sections 55 (Hotels and Restaurants) and 6304 (Travel Agencies and Tour Operators, etc.) of ISIC, Revision 3, 1990.

The ILO definition of the HCT sector is different from the definition of the tourism sector used by most organizations as it includes not only the services provided to travelers, but also those for residents. The tourism ratio of the turnover of hotels and restaurants, i.e. the proportion of their services provided to travelers, may range from one quarter to three quarters. Still, it is standard language to subsume the whole sector under "tourism". (ILO)

ILO believes that other activities in tourism are more difficult to define and are little represented at the institutional or associative level. As an example, communities in tourism destinations are very active in marketing as well as in running local public facilities for tourists. These activities are not properly covered by tourism statistics where they are called "collective tourism consumption," but they are very important for community strategies such as sustainable tourism development.

#### **UNWTO Definition**

The Statistical Office of the United Nations Secretariat in close co-operation with the World Tourism Organization (WTO) prepared an annex which covers the activities related to the tourism sector based on ISIC version 3.1 as shown in table 1 below.

**Table 1: Tourism related activities according to ISIC3.1**

ISIC	Activities	ISIC Section
5510	Hotels; camping sites and other provision of short-stay accommodation	hotels and restaurants
5520	Restaurants, bars and canteens	hotels and restaurants
6010	Transport via railways	transport, storage and communications
6021	Other scheduled passenger land transport	transport, storage and communications
6022	Other non-scheduled passenger land transport	transport, storage and communications
6110	Sea and coastal water transport	transport, storage and communications
6120	Inland water transport	transport, storage and communications
6210	Scheduled air transport	transport, storage and communications
6220	Non-scheduled air transport	transport, storage and communications
6304	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.	transport, storage and communications
7111	Renting of land transport equipment	real estate, renting and business activities
7112	Renting of water transport equipment	real estate, renting and business activities
7113	Renting of air transport equipment	real estate, renting and business activities
9219	Other entertainment activities n.e.c.	other community, social and personal service activities
9231	Library and archives activities	other community, social and personal service activities
9232	Museums activities and preservation of historical sites and buildings	other community, social and personal service activities
9233	Botanical and zoological gardens and nature reserves activities	other community, social and personal service activities
9241	Sporting activities	other community, social and personal service activities
9249	Other recreational activities	other community, social and personal service activities

As clearly shown in the above mentioned table, tourism related activities constitute a combination of four sections:

- Hotels and restaurants
- Transport, storage and communications,
- Real estate, renting and business activities

- Other community, social and personal service activities.

According to DoS, the highlighted activities are not available in Jordan; thus they are excluded from the study. As for the activity 9233 (Botanical and zoological gardens and nature reserves activities) a few data were available, and accordingly; it was also dropped from the study.

## 4 ICT in tourism:

---

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 Tourism a highly information-intensive industry as ICT has a potential impact on tourism business. The role of ICT in tourism industry 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. On the other hand consumers are also using online to obtain information and plan their trip and travel. Information is the key element in the tourism industry.

ICT pervades almost all aspects of tourism and related industries. For instance, Tourism depends upon ICT tools right from the beginning while identifying and developing tourism sites and destinations themselves. Technologies are also useful for site management and monitoring. The role of ICT tools in the industry for marketing, operation, and management of customers is widely known. Marketing techniques can be more innovative through ICT tools. Customer services: Management of customer relationships through booking travel, lodge etc, Monitoring: GIS (Geographic Information Systems), GPS (Global Positioning System), DMS (Destination Management Systems) are also used for managing and monitoring tourist sites.

Moreover, tourism needs ICT to perform many actions; such as implementing the integration of various sectors like the technical infrastructure, the human infrastructure, which includes skilled people, vision and management, subsidies for Internet service providers, design an integrated framework for online advertisement or official endorsement for online marketing, maintenance and updating websites, and establishing electronic linkages between all related sectors. Hence, ICT applications in different activities are important; like airlines, hotels (hospitality sector), tour operators, road and rail transport, entertainment sector, etc.

Technological progress has made tourism across the globe more innovative than ever. The three important innovations, which have re-defined the organizational structure of world tourism industry, are:

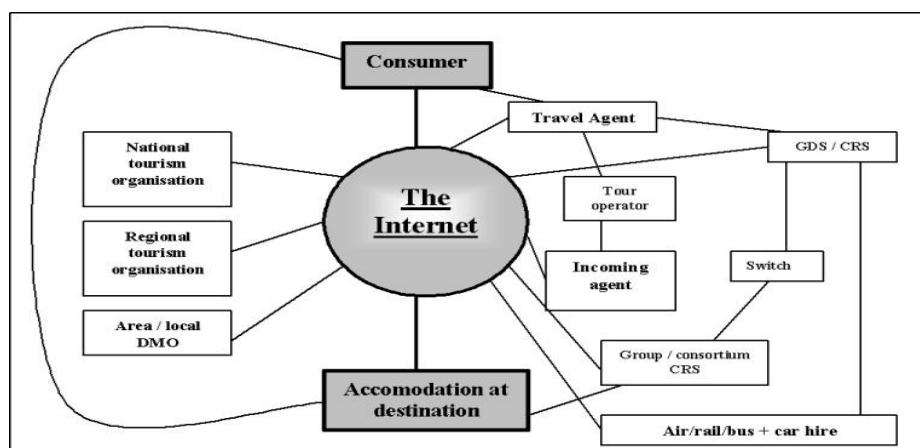
1. Development of the Computer Reservation System (CRS)
2. Development of the Global Distribution System (GDS)
3. The Internet.

GDS refers to the network connection integrating the automated booking systems of different organizations which enables the user to access it through the intermediation of a travel agency. The supply of services is presently concentrated with four global suppliers owned by airline companies namely Sabre, Amadeus, Galileo International and Worldspan. The functioning of these companies

depends upon a network of agreements with local partners which ensures access to travel agencies all over the world.

The advantages and evolution of CRS and Internet are well known. Internet strategy has provided all players in the industry an easy access to the end user. Exploitation of opportunities through Internet depends upon marketing strategy, communication strategy, pricing strategy etc. Direct communication with the clients, which is facilitated by the Internet, has made the industry more effective and efficient.

The chart below shows the internet role in performing the integration between the related units.



**Figure 2: the role on internet in performing the integration between the related units**

Source: (Shanker, 2008).

### **The Impact of ICT on Labor and Demand in Tourism:**

The most commonly used computer applications of word processing, reservations and accounting increase the productivity of employees. However, the real benefit of information technology lies in the linking and reconfiguring of business and organizational functions, resulting in a lowering of operational costs, improved communications with stakeholders and the ability to operate internationally. Customer-centric strategies that actively seek an inward flow of information from consumers of tourism products underpin a strategic use of ICT to change an organization's boundaries.

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. But this is compounded in the case of accommodation by the difficulty in measuring productivity in general.

## 5 The importance of tourism in Jordan:

Tourism is the largest global industry, and the tourism market is growing. According to world Tourism Organization (WTO), the global tourism market will triple in size by 2020. (WTO,2010)

Tourism benefits local economies substantially by increasing foreign exchange earnings, creating employment and investment opportunities, increasing government revenues, developing a country's image, and supporting all sectors of the economy as well as local communities.

Tourism is of vital importance to the national economy of Jordan. It is the Kingdom's largest export sector, the second largest private sector employer, and the second highest producer of foreign exchange. Tourism contributes more than US\$800 million to Jordan's economy and accounts for approximately 10 percent of the country's gross domestic product (GDP). (MoTA, Jordan National Tourism Strategy).

Tourism receipt in Jordan reached the amount of JD 2,067 million for the year 2009 and the number of employees reached the amount of 40,092 for the same year. (MoTA, 2009 annual bulletin)

Despite its advantage and its importance to the economy, Jordan's tourism sector is performing at a level far below its potential. To achieve reasonable growth in the tourism sector that will in turn contribute to economic development and job creation, Jordan needs to make a significant investment of funds and efforts.

MOTA, with closed cooperation with other parties, is responsible for preparing the Jordan national tourism strategy aiming to develop sustainable tourism through a partnership of government, the private sector, and civil society to expand employment, entrepreneurial opportunity, social benefits, industry profits, and state revenue. This strategy is designed to bring about the following results by 2010:

- Increase tourism receipts from JD570 million in 2003 to 1.3 billion (US\$ 1.84 billion)
- Increase tourism-supported jobs from 40,791 in 2003 to 91,719, thus creating over 51,000 jobs.
- Achieve taxation yield to the government of more than JD455 million (US\$637 million)

As illustrated in the below chart; the strategy demonstrates on the tourism value chain and shows the integration between these chains.



**Figure 3: Tourism value chain**

**Source: MoTA.**

Based on Central Bank of Jordan (CBJ) figures for the tourism sector; the performance of this sector improved in 2008; the real value added of the sector grew by 8.8 percent compared to 2.8 percent in 2007. Consequently, the sector's relative importance to GDP, at constant basic prices, went up to stand at 4.9 percent compared to 4.8 percent in 2007.

A closer look at the developments experienced by the tourism sector during 2008 indicates an improvement in the performance of most related indicators. The number of tourists was up by 9.2 percent in 2008 compared to 2007 level to reach 7.1 million tourists, of which 52.5 percent represent overnight tourists, while the remaining 47.5 percent represent one-day visitors. In addition, tourism income grew by 27.5 percent to reach JD 2,088.5 million, or 14.7 percent of GDP at current market prices, compared to a growth amounting to 12.2 percent in 2007. Moreover, number of hotels, classified and unclassified, increased in 2008 to reach 481 hotels against 470 hotels in 2007. Further, number of hotel rooms went up to reach 22.5 thousand rooms with an occupancy rate standing at 55.3 percent compared to 21.6 thousand rooms with an occupancy rate standing at 47.3 percent in 2007.

Furthermore, number of employees working in the tourism sector increased by 11.3 percent; amounting to 38.3 thousand employees against 34.4 thousand employees in 2007.

With respect to investments benefiting from the Investment Promotion Law in the tourism sector, these investments surged noticeably in 2008 compared to their level in 2007; increasing by 76.2 percent, or JD 310.0 million, to reach JD 717.0 million distributed amongst 28 projects compared to JD 407.0 million distributed amongst 14 projects in 2007.

As for credit facilities extended by licensed banks to the tourism sector, the balance of these facilities increased significantly at the end of 2008; growing by 43.3 percent to total JD 366.6 million compared to a rise of 31.1 percent at the end of 2007. These facilities accounted for 2.8 percent of total balance of credit facilities extended by licensed banks. (CBJ, 2008 annual report).

One of the important sub-sectors to tourism is restaurants and Hotels; this sub-sector is a part of the sector: hotels, restaurants and trade. According to CBJ data for the whole sector for the year 2008 this sector witnessed a deceleration in its performance in 2008; the value added of this sector, at constant basic prices, grew by 5.7 percent compared to a growth of 8.4 percent in 2007. As a result, the contribution of this sector to GDP growth, at constant basic prices, went down to stand at 0.7 percentage point (of which 0.6 percentage points for trade subsector and 0.1 percentage points for "restaurants and hotels" sub-sector), compared to a contribution of 1.0 percentage point in 2007 (of which 0.9 percentage point for trade sub-sector and 0.1 percentage point for "restaurants and hotels" sub-sector).

However, the relative importance of this sector to GDP, at constant basic prices, increased over its level in 2007 by 0.1 percentage point; standing at 11.7 percent in 2008. The slowdown in "trade, restaurants and hotels" sector was, mainly, a result of the deceleration in the "wholesale and retail trade" sub-sector, which accounts for 90.8 percent of the whole sector. This sub-sector grew at 5.4 percent compared to a growth of 9.0 percent in 2007. On the other hand, the growth in "restaurants and hotels" sub-sector was up markedly; amounting to 8.9 percent against a growth of 2.1 percent in 2007, due to the improvement in internal tourism during the same year.



## 5.1 Tourism Micro-level analyses:

The department of statistics provides segmented data on activity level mainly through the economic survey. The latest published figures for the economic indicators are related to the year 2007, so the underneath figures show the same year.

Some economic activities are grouped with each others in DoS tables; 6021;6022 and 6210;6220.

### 5.1.1 Gross output 2007

Looking at the gross output figures for year 2007 for the activities related to tourism, we can see that the highest ratio for the gross output from the total activities' gross output is for "scheduled air transport and the non scheduled ones" with a ratio of 33% from the total gross output of tourism sector, other scheduled passenger land transport and the other non-scheduled ones reached the amount of 25%, hotels, and camping sites reached the amount of 13%.

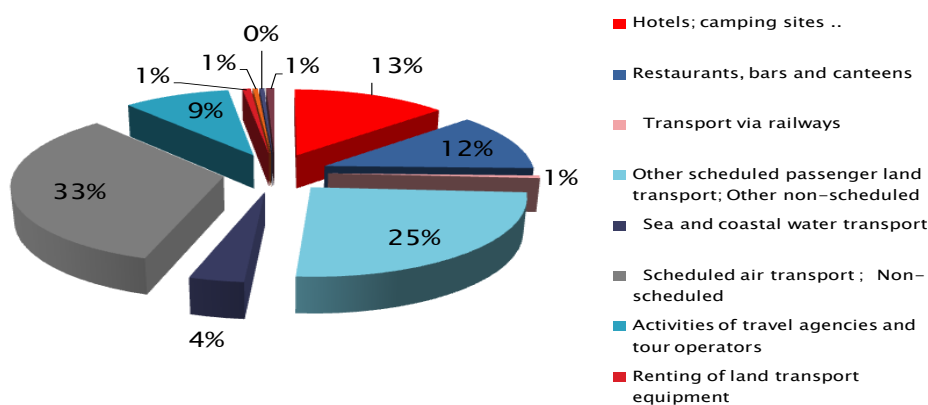
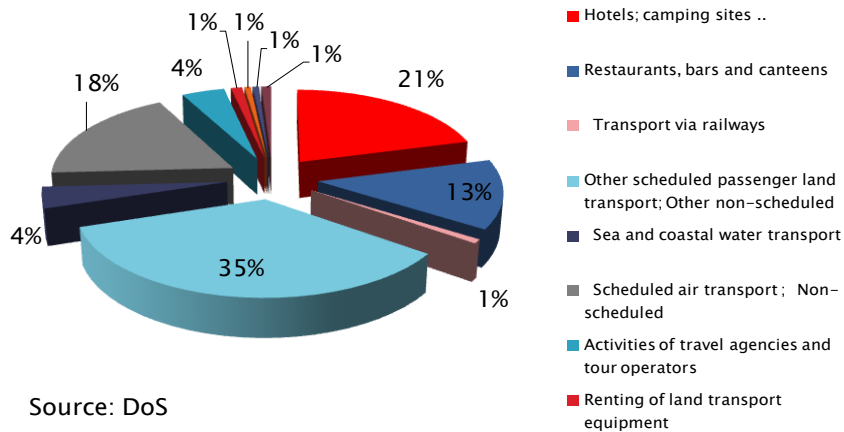


Figure 4: Activities' Gross output

Source: DoS

### 5.1.2 Value added 2007

Regarding the value added figures, it's clearly seen from the below pie chart that the highest ratio of value added is for other scheduled passenger land transport, and the other non-scheduled ones with the ratio of 35% from the total activities' value added. Hotels and camping sites reached the ratio of 21%, 18% is for the activity of scheduled and non scheduled air transport.



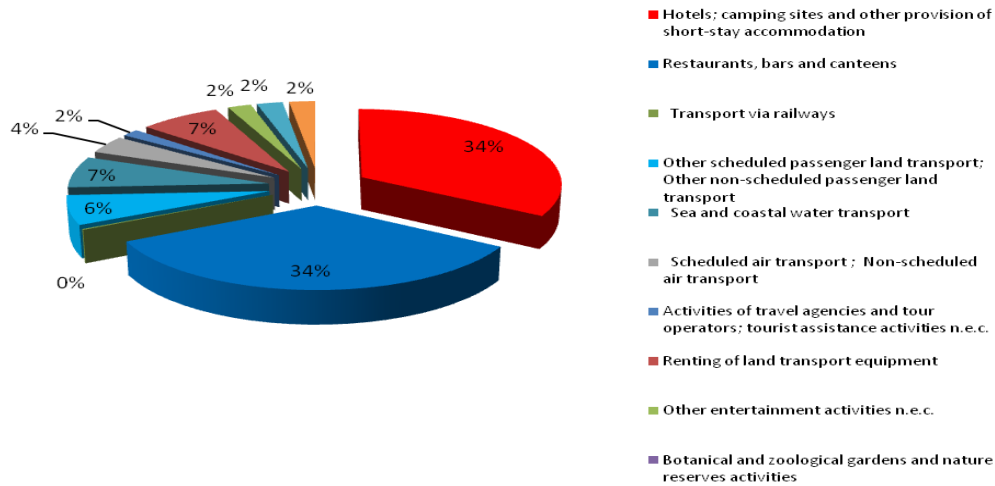
**Figure 5: Activities' value added**

### 5.1.3 Taxation:

Regarding the taxation figures provided by ISTD for the year 2007; we can see the following:

#### Sales tax:

The highest ratio in terms of sales tax is, separated equally between the hotels, camping sites and the restaurants, bars and canteens with the amount of 34% each from the total sales tax for the activities.

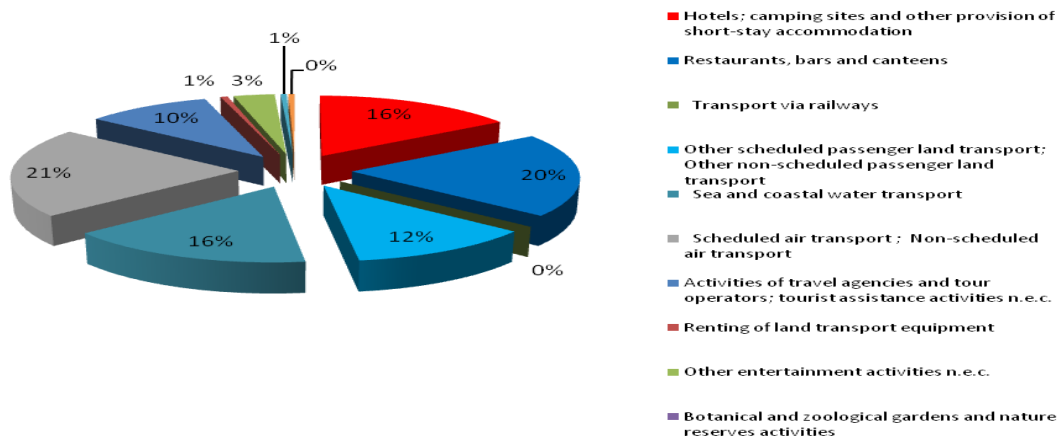


**Figure 6: Activities' sales tax**

Source: ISTD

**Income tax:**

For the income tax, the highest ratio is for the scheduled and non scheduled air transport with the amount of 21%, the second highest ratio is for restaurants, bars and canteens with the ratio of 20%, then 16% is for each hotels, camping sites and sea and costal water transport.

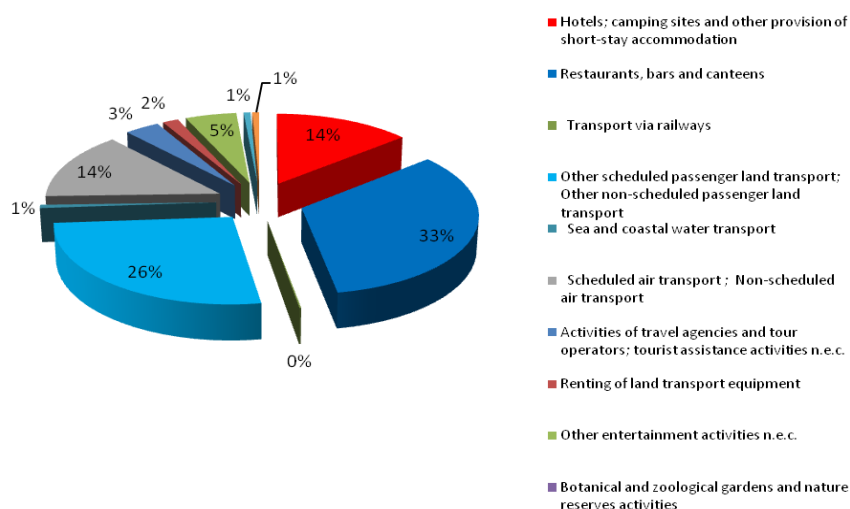


**Figure 7: Activities' income tax**

Source: ISTD

## Employees Income Tax

As shown in the below figure; around the third of total employees income tax in tourism sector is collected from the employees working in restaurants, bars and canteens, second highest is the other scheduled and non scheduled passengers land transport with the ratio of 26%, hotels, camping sites and scheduled and non scheduled air transport reached 14% each.

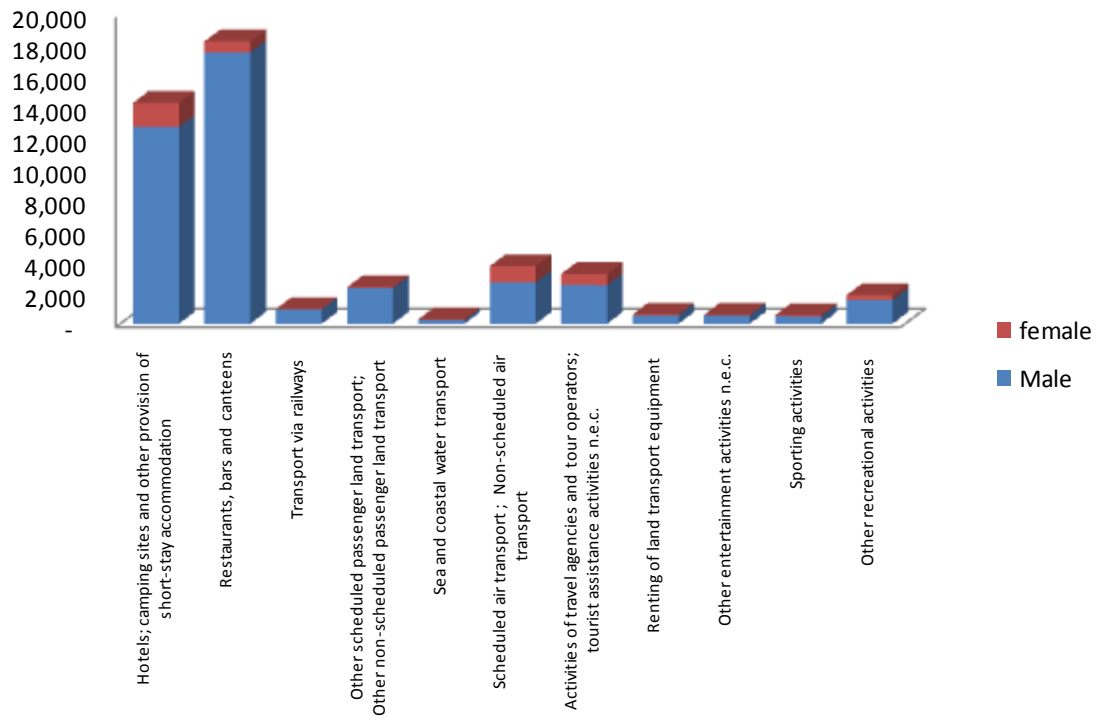


**Figure 8: Activities' Employees' income tax**

Source: ISTD

## 5.2 Employees 2007: Females & males

Regarding the total employees working in the related activities, the highest employment figure was for restaurants, bars and canteens and the second highest one is the activity of hotels, and camping sites, regarding the female figures; the highest ratio is for hotels and camping sites, the second rank is for scheduled and non-scheduled air transport, followed by Activities of travel agencies and tour operators.



**Figure 9: Employees; females and males**

Source: DoS

## 6 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.

According to ISIC 3.1, the ICT sector was defined to include the telecommunication and IT related activities on the 4 digits level, detailed in the below table

**Table 2: ICT related Activities based on ISIC3.1**

Telecommunication 6420
- Satellite telecommunication activities
- Wired telecommunication activities
- Wireless telecommunication activities
- Other telecommunication activities
IT Related Activities
<b>7220 - Software consultancy and supply</b>
<b>7221 - Software publishing</b>
<b>7229 - Other software consultancy and supply</b>
<b>7250 - Maintenance and repair office, accounting and computer machinery</b>
<b>7290 - Other computer related activities includes:</b>
- Computer consultancy and facilities management activities
- Other information technology and computer service activities
- Web Portals
- Data processing, hosting and related activities
- Software publishing
<b>5151 - Wholesale of computer, computer peripherals equipment and software</b>
<b>5152 - Wholesale of electronic and telecommunications parts and equipment</b>

To detail the assessment of the impact of the ICT on the tourism sector and the related activities, several aspects of the business and economic environment were identified. The analysis was completed on both the macro as well as on the micro level of this sector.

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.

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) in order to test for the marginal effect of the ICT variables on the pre-mentioned aspects.

### 6.1 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 represented by its activities. This amount of change has been calculated relatively to the total amount of GDP.

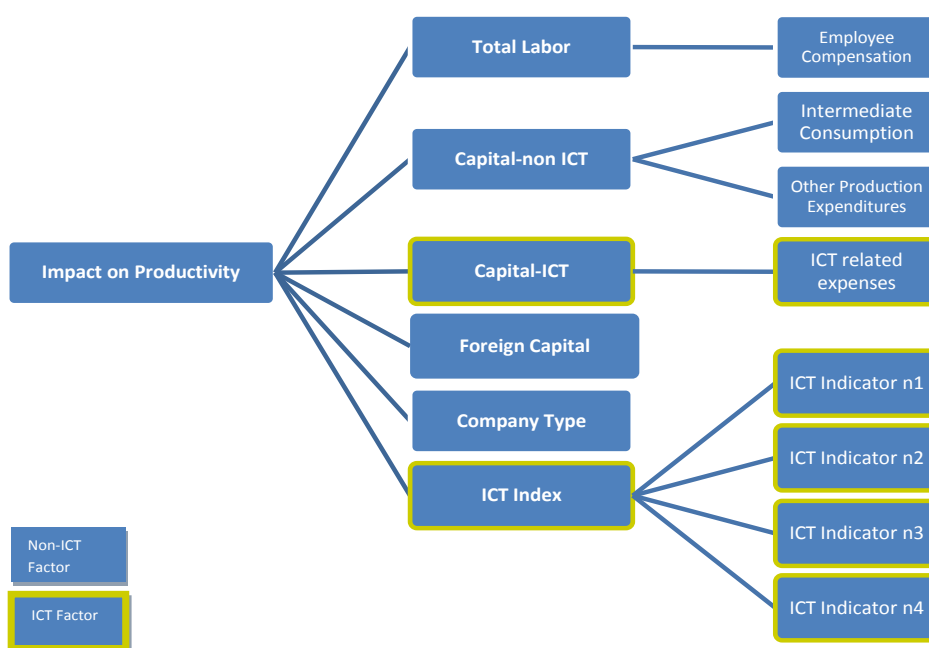
### 6.2 Productivity:

- 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, is a developed index for the purpose of this study. It 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 10: Impact on Productivity Factors**

The productivity regression equation took the following form:

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

Where:

GO : Gross output

Labor<sub>C</sub> : Labor Compensation

(K)<sub>non-ict</sub> : Capital-Non-ICT

(K)<sub>ict</sub> : Capital-ICT

FK : Foreign Capital

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

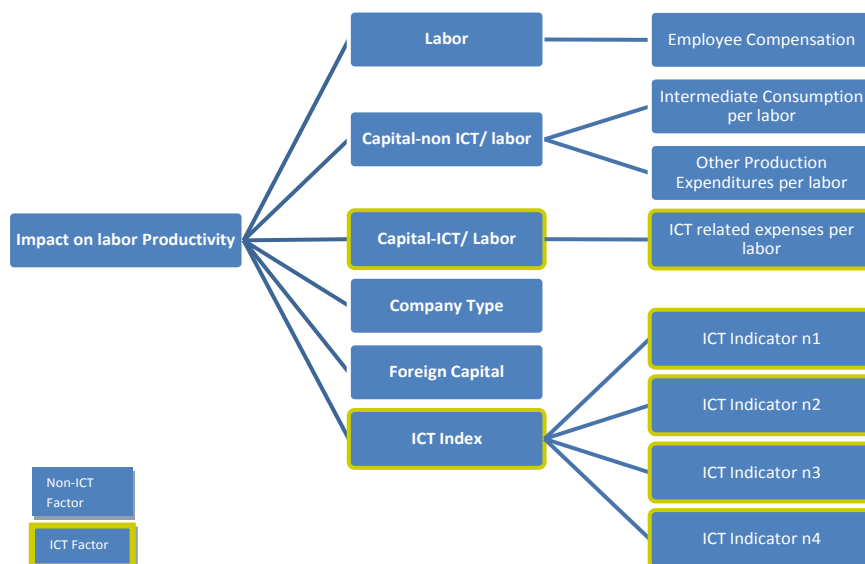
ICT : ICT index

€: error term

### 6.3 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 before).



**Figure 11: Impact on labor Productivity Factors**



The regression equation took the following form:

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

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 (covers the ICT Adaption, Readiness, E-government and E-business); each one is a combination of sub indices.

€: error term

#### 6.4 Employment:

- 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 and its companies.
- \* 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

#### 6.5 Female gender aspect:

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

#### 6.6 Taxation:

- The ICT impact on **Taxation in the tourism sector** was 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.

## 7 ICT Impact Assessment Results

---

### Impact Results:

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

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 are 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 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 only significant results were for the first and the last approaches. The final approach has the major impact on labor productivity; it creates 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.

### 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.

#### 7.1 Activity 5510: Hotels; Camping Sites and Other provision of Short-Stay Accommodation:

##### 7.1.1 Impact on productivity:

Applying the regression analyses for this activity shows that the only significant result is for the ICT index, while the ICT capital results were non-significant. The standardized coefficient for ICT shows the amount of 14%, this means 14% from the change in gross output is due to the ICT diffusion in this activity.

##### 7.1.2 Impact on labor productivity:

Results for the labor productivity in this sector were similar to the productivity aspects; the only significant result was for the ICT index, and the impact ratio reached the amount of 8%. This means

8% from the change in the labor productivity is explained by the ICT diffusion and deployment in the activity.

This result seems to be logical if we consider labor productivity increases due to the increase in bookings or occupancy rates in hotels (ratio of occupied rooms); since satisfying client needs requires more use of PCs, systems, internet and call centers. These tools facilitate the booking process. Moreover, more advanced revenue management systems reduce the figures of “no-show” resulting from poor forecasting for future demand.

The increasing internet bookings and the integration between many related activities create an increasing need for expanding the ICT adaption in this activity.

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 84% for the enterprises working within this activity own internet; this ratio is considered high. 75% have a web site which is something necessary for this activity. Moreover; 42% have the intranet service.

Most importantly, the ratio of firms their employees using PCs on daily basis reached 93% from the total firms working within this activity, and (on average) 60% of computers are connected to the internet in the activity.

### 7.1.3 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 one million, equals to JD (925,940).

The highest figure for the impact on taxation was from the sales tax, then from the employees income tax, the corporate income tax was the least between the group.

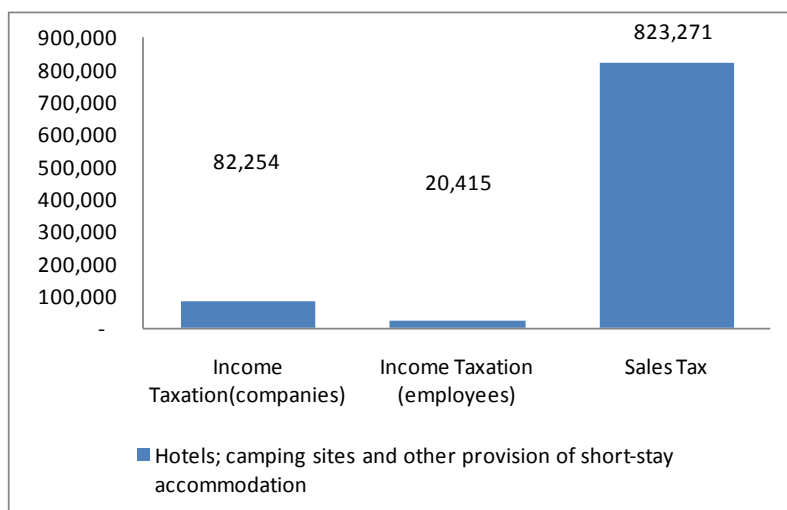


Figure 12: Impact on Taxation (hotels and camping site)

#### 7.1.4 Impact on Employment:

Regarding the impact on employment, the results show the amount of 775 employment opportunities, 545 are indirect employees while 230 are the induced ones.

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

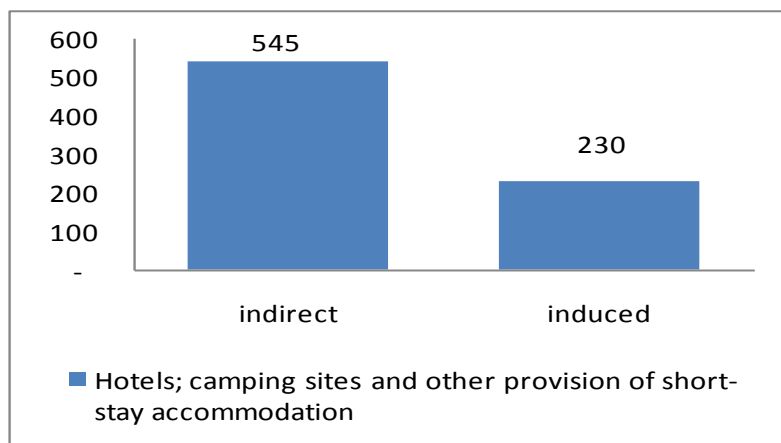


Figure 13: Impact on Employment (hotels and camping site)

#### 7.1.5 ICT Impact on Female Gender Aspect

Within the workforce itself, the ICT sector has a large impact on gender balance. ICT reduces the need for physical labor and creates more white-collar 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 found 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 correlation factor of 0.57 indicating a moderate relationship between ICT diffusion and female employment. \*

\*(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 this value is from 1; the stronger the relationship is, while zero value indicates no correlation between the variables)

## 7.2 Activity 5520: Restaurants, Bars and Canteens:

#### 7.2.1 Impact on productivity:

Unfortunately, applying the analyses for this activity shows no significant results for the impact of ICT on this aspect.

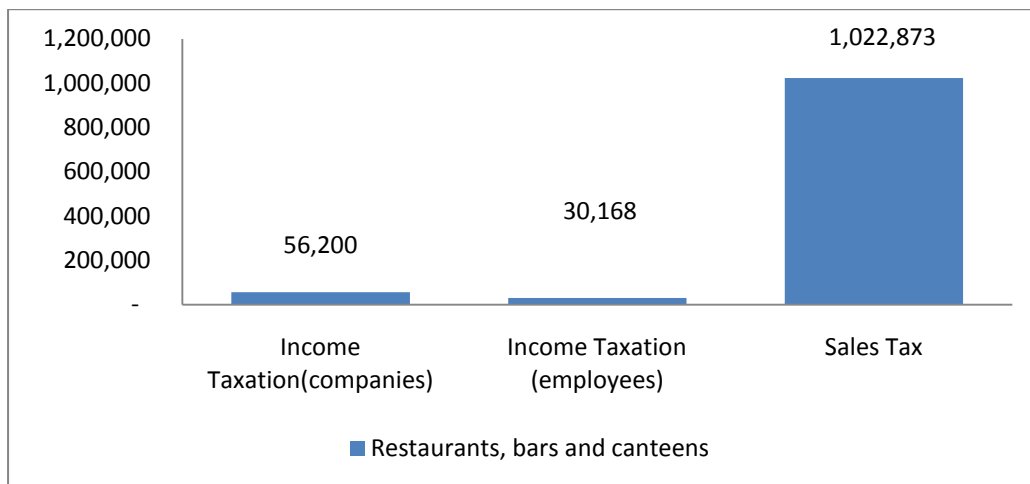
### 7.2.2 Impact on labor productivity:

ICT variables affect labor productivity in this activity by around 62%, both ICT index and ICT capital were significant in their effect to the labor productivity in this activity.

The impact ratio is considered to be high as providing services in this activity requires the use of ICT for bookings, receiving and managing customer requests.

### 7.2.3 Taxation:

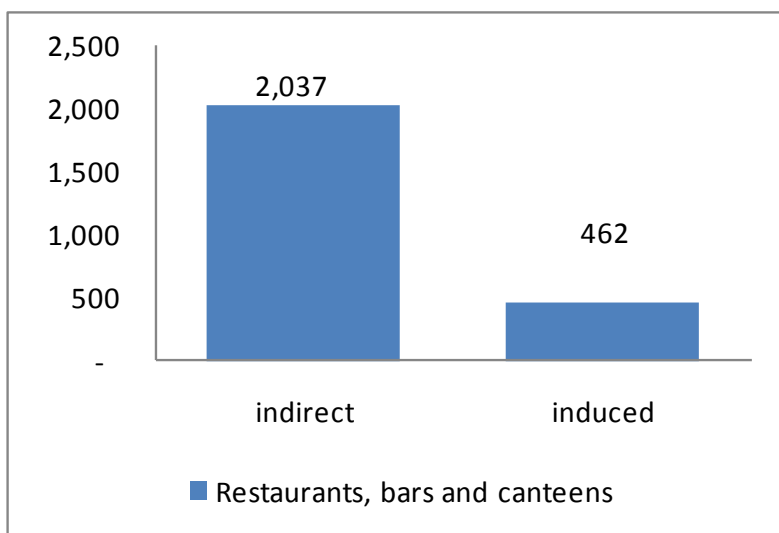
As for the taxation figures, ICT affect taxes collected from this activity by more than JD one million. The highest amount is from sales tax, this high amount of sales tax is considered to be reasonable for such activity. The companies' income tax reached the amount of around JD 56,000 while the lowest tax figures were for the employees' income tax.



**Figure 14: Impact on Taxations (Restaurants, bars and canteens)**

### 7.2.4 Employment:

For the employment figures, the total impact of ICT on employment opportunities reached the amount of more than 2000 employees. This result represents the first rank for activities in terms of ICT impact on employment in tourism related activities. This total number is divided into around 2037 indirect opportunities and 462 induced ones.



**Figure 15: Impact on Employment (Restaurants, bars and canteens)**

### 7.2.5 Female gender:

The correlation factor for this activity shows a high amount that reached 0.70; this means ICT use in this activities provides more opportunities for females to be included in the workforce.

## 7.3 Activity 6010: Transport via Railways:

### 7.3.1 Impact on productivity:

Regression analyses for this activity show no significant results; this result was predicted due to the nature of the service provided and the size of it, as it mainly consists of just two companies.

### 7.3.2 Impact on labor productivity:

Regression analyses for this activity show no significant results. Thus, the impact couldn't be measured.

### 7.3.3 Taxation:

The unique effect of ICT on taxation in this activity is limited to employee's income tax which reached an amount of JD 3000. No effect was found on sales or corporate income taxes; this is due to the nature of companies working under this activity as they are owned by government.

#### 7.3.4 Employment:

Due to the insignificant results obtained from the labor productivity aspect, no impact on employment was measured.

#### 7.3.5 Female gender aspect:

Correlation factor for female gender aspect is consistent with the previous results: a very weak factor of about 0.14, this could be explained by the nature of this activity and the female employment ratio which didn't exceed 2% from the total employment figures in the activity.

### 7.4 Activity 6021 and 6022: Other Scheduled Passenger Land Transport and Other Non-Scheduled Passenger Land Transport:

#### 7.4.1 Productivity:

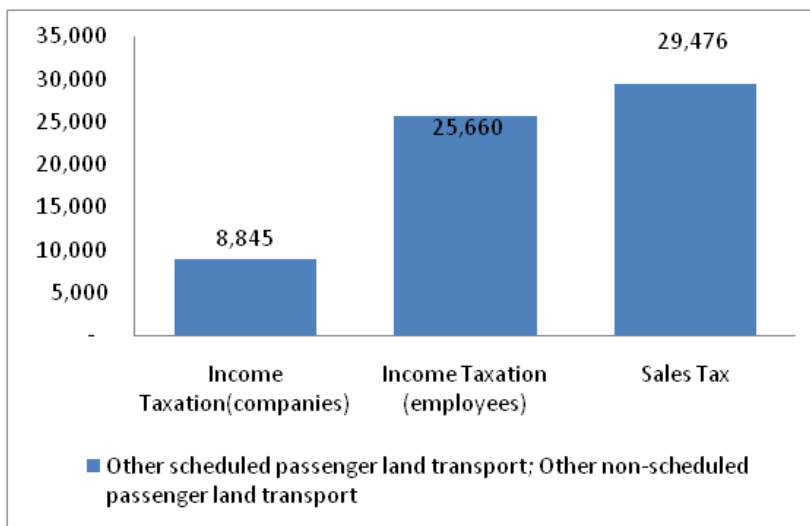
Regression analyses show no significant results for the impact of ICT on productivity in this activity.

#### 7.4.2 Labor productivity:

For the labor productivity, the only effective factor is the ICT capital; the impact ratio was high and reached the ratio of 67%.

#### 7.4.3 Taxation:

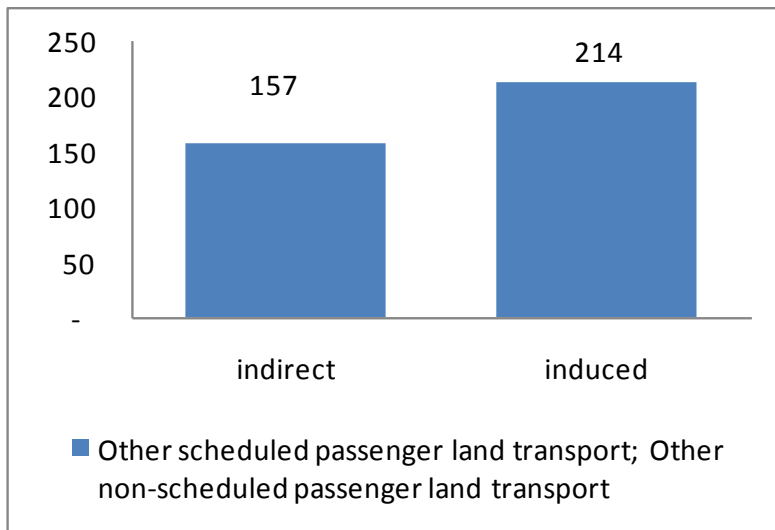
The impact on taxation reached around JD 64,000; the highest portion is from the sales tax with the amount of JD 29,476, then from employees' income tax of around JD 26,000. The lowest is for companies' income taxes.



**Figure 16: Impact on Taxation (Other scheduled passenger land transport and other non-scheduled passenger land transport, JD).**

#### 7.4.4 Employment:

The total ICT impact on employment in this activity reached 371 employees, 157 as indirect opportunities and 214 as induced.



**Figure 17: Impact on Employment (Other scheduled passenger land transport and other non-scheduled passenger land transport)**

#### 7.4.5 Female gender aspect:

Correlation factor in this activity showed a high ratio that reached the amount of 0.89, although the actual ratio of females working in this sector is very small.

It is worth mentioning here that the correlation direction or amount is affected by the nature and the accuracy of the data, which may NOT represent the reality.

### 7.5 Activity 6110: Sea and Coastal Water Transport

#### 7.5.1 Productivity:

Regressing ICT variables in this activity shows that ICT capital has a significant impact on productivity, whereas the ICT index does not. The impact ratio reached the amount of 41%, which is considered. This may be explained by the impact of control and monitoring systems deployed in this activity which requires a reasonable level of capital.

#### 7.5.2 Labor productivity:

For the labor productivity, both ICT indicators are significantly shown causing an impact of 67% which is also considered as a high impact ratio.



It's commonly understood in economic analysis that the marginal impact in the first stages of production will be higher than the next ones due to what is called "the diminishing law of product". This means for the activities with the emerging use of ICT, the impact will be higher than the mature ones. This law helps in understanding some of the study's results.

### 7.5.3 Taxation:

The collected amount of taxes reached more than JD 240,000. The amount of sales tax was the highest as it reached JD 222,000, followed by the companies' income tax, and lastly the employees' income tax.

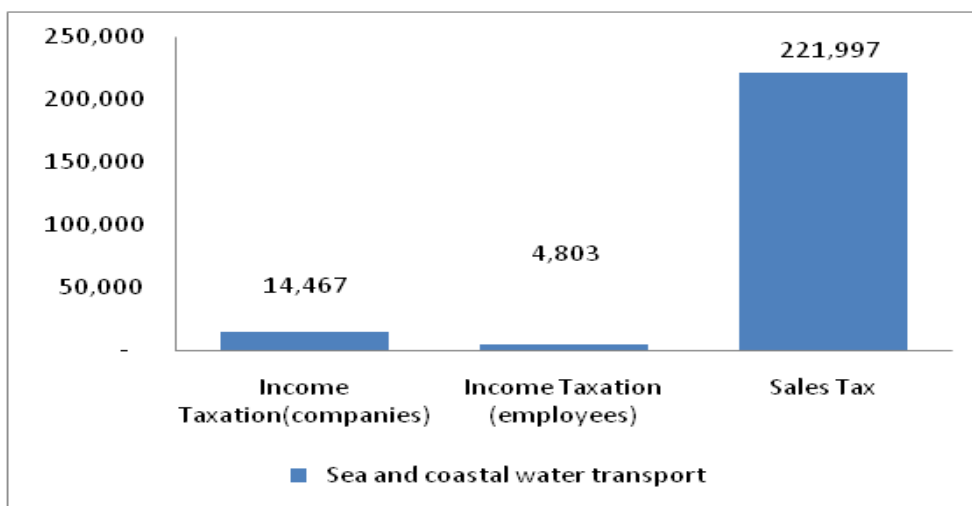


Figure 18: Impact on Taxation (Sea and coastal water transport)

### 7.5.4 Employment:

The total impact on employment reached the amount of 128 in this activity; 73 are induced and 54 as indirect opportunities.

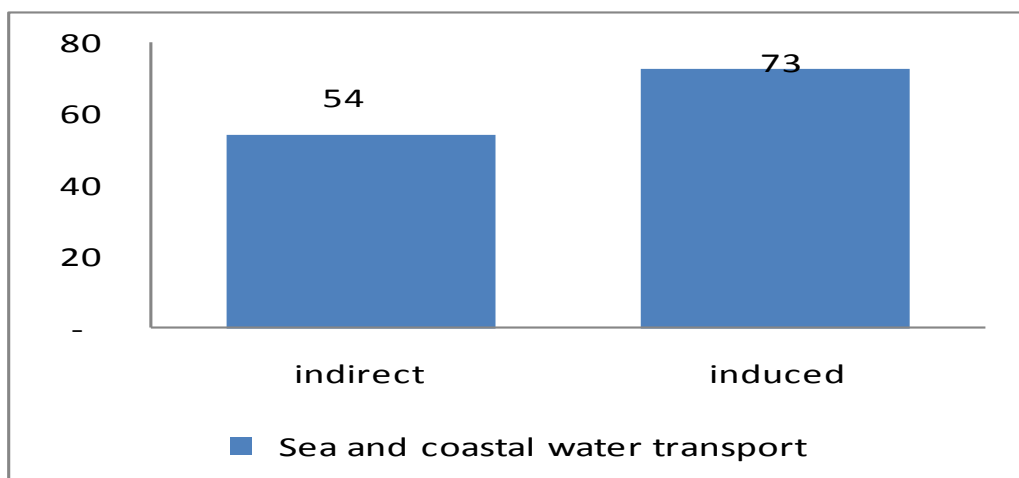


Figure 19: Impact on Employment (Sea and coastal water transport)

### 7.5.5 Female Gender Aspect:

Results show very low correlation factor in this activity, it didn't exceed 0.11.

## 7.6 Activity 6210 and 6220: Scheduled Air Transport and Non-Scheduled Air Transport:

### 7.6.1 Productivity:

Regressing the ICT variables in this activity shows that neither ICT capital nor ICT index has significant impact on productivity, although this activity is considered as high tech-one, but the result could be due to the statistical nature of the data.

### 7.6.2 Labor productivity:

As for the labor productivity, results were similar to productivity aspect results and no significant impact was identified.

### 7.6.3 Taxation:

The collected amount of taxes due to the ICT use in this activity reached a small amount, as the total amount was around JD 10,000.

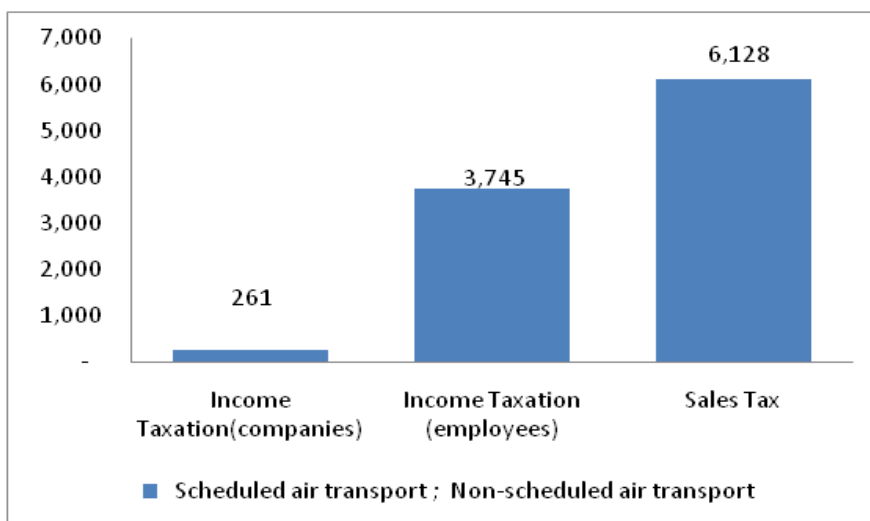


Figure 20: Impact on Taxation (Scheduled air transport and Non-scheduled air transport)

### 7.6.4 Employment:

Due to non significant results, the impact on employment couldn't be measured.

### **7.6.5 Female Gender Aspect:**

Unexpectedly, the correlation factor doesn't only show a very weak value, but also represents a negative value; this means increasing the ICT diffusion in the activity reduces female employment in the same activity.

Trying to explain these unexpected results by looking at the original employment figures in the activity, these figures take a stochastic fluctuating trend, reconfirming the previously mentioned point that correlation reflects the nature of available data and not necessarily the real relationship.

## **7.7 Activity 6304: Activities of Travel Agencies and Tour Operators; Tourist Assistance Activities n.e.c.**

### **7.7.1 Productivity:**

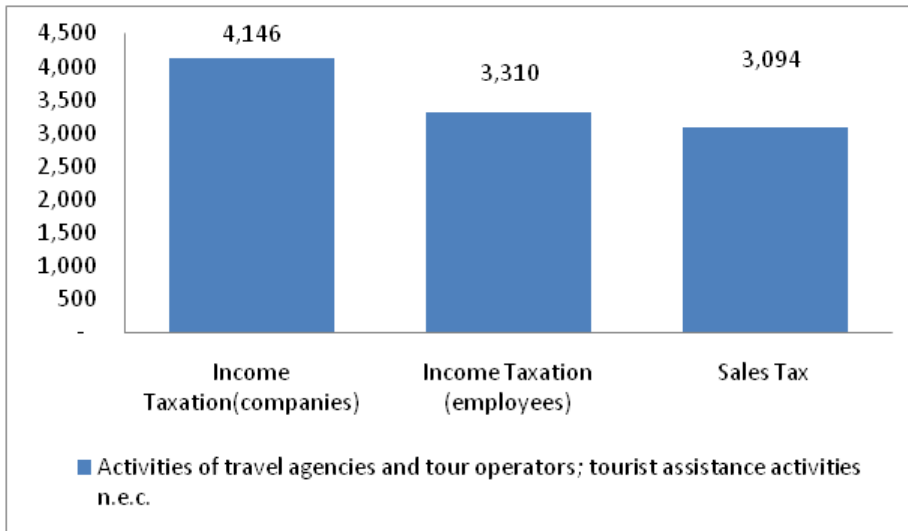
Regressing the ICT variables in this activity shows that neither ICT capital nor ICT index has significant impact on productivity, although this activity is considered as high tech-one, but the results could be due to the statistical nature of available data.

### **7.7.2 Labor productivity:**

Regarding the labor productivity, results show that ICT index was statistically significant in affecting labor productivity, the impact size reached 14%; this means 14% from the total change in labor productivity is explained by the ICT diffusion in the activity.

### **7.7.3 Taxation:**

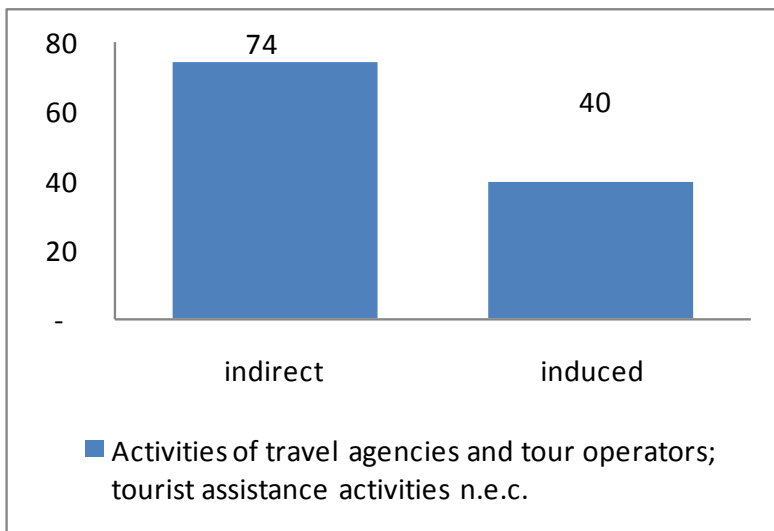
The collected amount of taxes due to the ICT use in this activity reached a small amount; the total didn't exceed JD 9,000, and the highest portion of these taxes is from the companies' income taxes.



**Figure 21: Impact on Taxation (Activities of travel agencies and tour operators)**

#### 7.7.4 Employment:

Total impact on employment reached 114 opportunities; 74 are indirect while 40 are induced.



**Figure 22: Impact on Employment (Activities of travel agencies and tour operators)**

#### 7.7.5 Female Gender Aspect:

Unexpectedly; the gender –ICT correlation factor in this activity shows a negative and low value, this value didn't exceed 0.32.

Trying to explain this unexpected result by looking at the original employment figures in the activity, these figures take a diminishing trend in the last four years of the analysis period, this reconfirms the

previously mentioned point that correlation factor reflects the nature of the available data and not necessarily the real relationship.

## 7.7 Activity 7111: Renting of Land Transport Equipment:

### 7.8.1 Productivity:

Applying the analyses for this activity shows no significant results for the impact of ICT on productivity.

### 7.8.2 Impact on labor Productivity:

ICT variables affect labor productivity in this activity by around 24%, both ICT index and ICT capital were statistically significant in their impact on labor productivity.

### 7.8.3 Impact on Taxation:

Regarding the impact on taxes collected from this activity as a result of ICT use, the results show that the impact magnitude was around JD 38,200 , the majority is from sales tax.

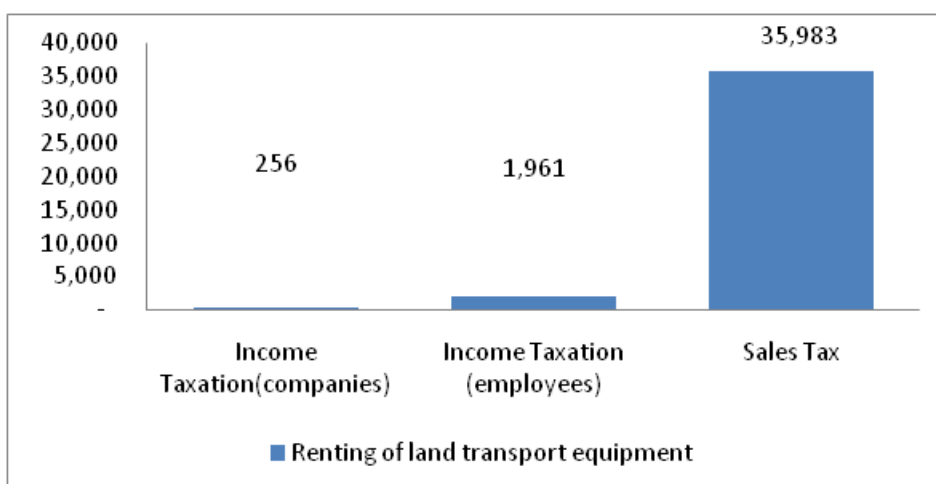
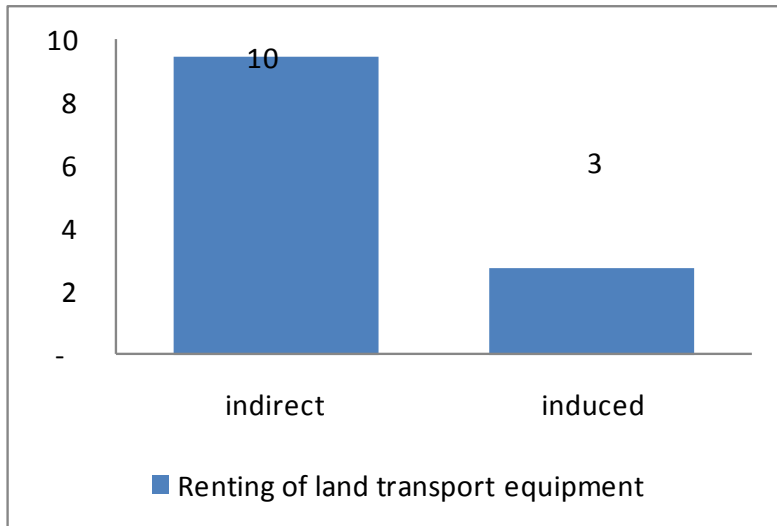


Figure 23: Impact on Taxation (Renting of land transport equipment)

### 7.8.4 Impact on Employment:

Regarding the impact on employment; results show very small figures for both induced and indirect employment opportunities. The total impact reached 13 employees, 10 are indirect and 3 are induced. This result is also considered to be very small, but at the same time logical due to the small employment size working in this activity.



**Figure 24: Impact on Employment (Renting of land transport equipment)**

### 7.8.5 Female Gender Aspect

The impact on female is found to be very weak; the correlation factor shows a low value of around 0.34 indicating a low relationship between ICT diffusion and female employment in this activity. And this result is considered to be logical due to the nature of this activity and the low female participation in activity workforce.

## 7.8 Activity 9219: Other Entertainment Activities n.e.c.

### 7.9.1 Productivity:

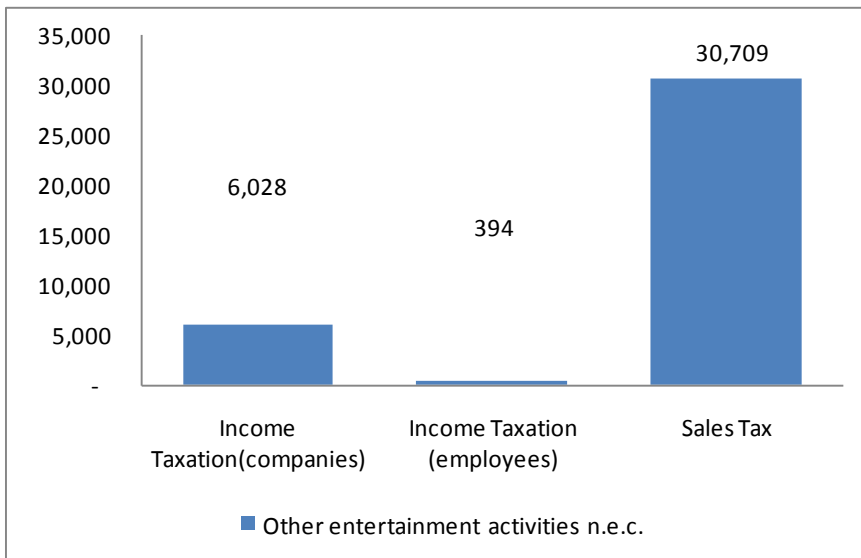
Applying the analyses for this activity shows no significant results for the impact of ICT on productivity.

### 7.9.2 Labor Productivity:

ICT capital has a statistical significant impact on labor productivity; the impact size reached the value of 31%.

### 7.9.3 Taxation:

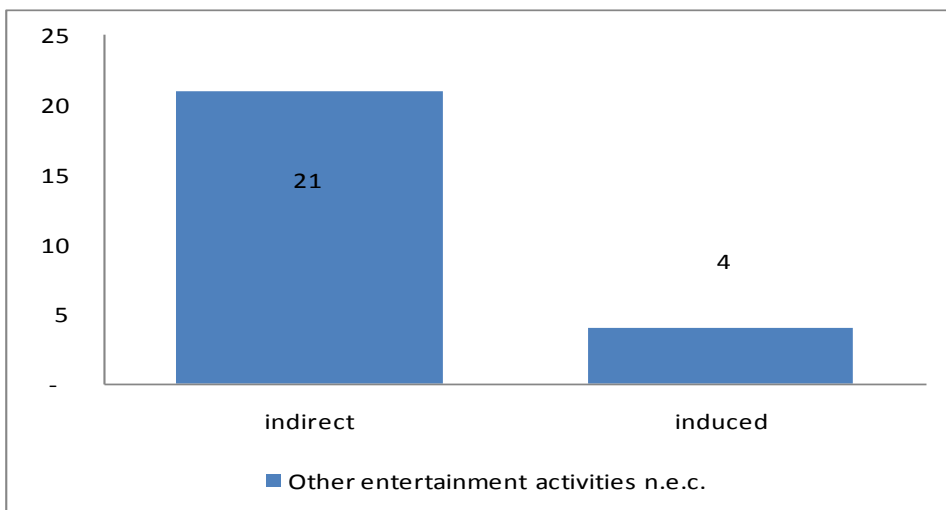
Regarding the impact on taxes collected from this activity as a result of ICT use, the results show that the impact magnitude was around JD 37,000, the majority came from sales tax.



**Figure 25: Impact on taxation (Other entertainment activities)**

**7.9.4. Employment:**

Regarding the impact on employment; results show very small figures for both induced and indirect employment opportunities. The total impact reached 25 employees, 21 are indirect and 4 are induced. By looking at the number of employees working in this activity, this result can be considered, relatively, acceptable.



**Figure 26: Impact on Employment (Other entertainment activities)**

**7.9.5 Female Gender Aspect:**

The correlation factor in this activity was small and didn't exceed 0.35.

## 7.9 Activity 9241: Sporting Activities

### 7.10.1 Productivity:

Applying the analyses for this activity shows no significant results for the impact of ICT on productivity.

### 7.10.2 Labor Productivity:

ICT Index affects labor productivity in this activity by around 54% while ICT capital was statistically insignificant in its impact on labor productivity.

### 7.10.3 Taxation:

Regarding the impact on taxes collected from this activity as a result of ICT use, the results show that the impact magnitude was around JD 75,000; the majority came from sales tax.

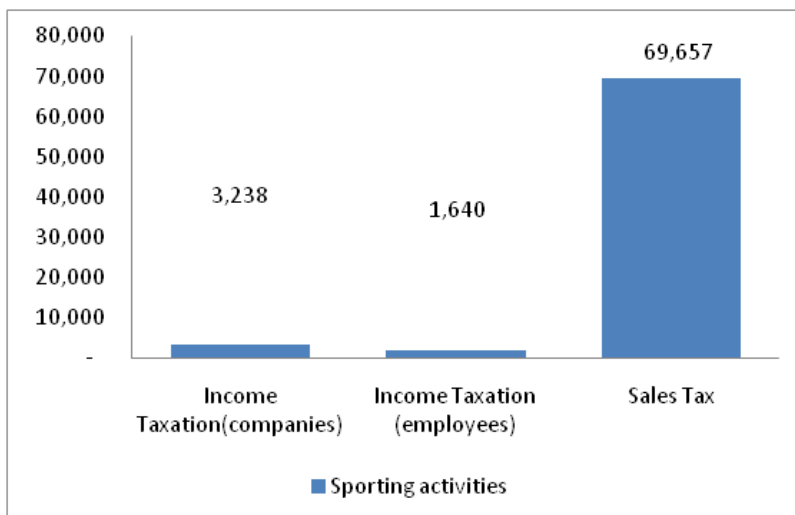
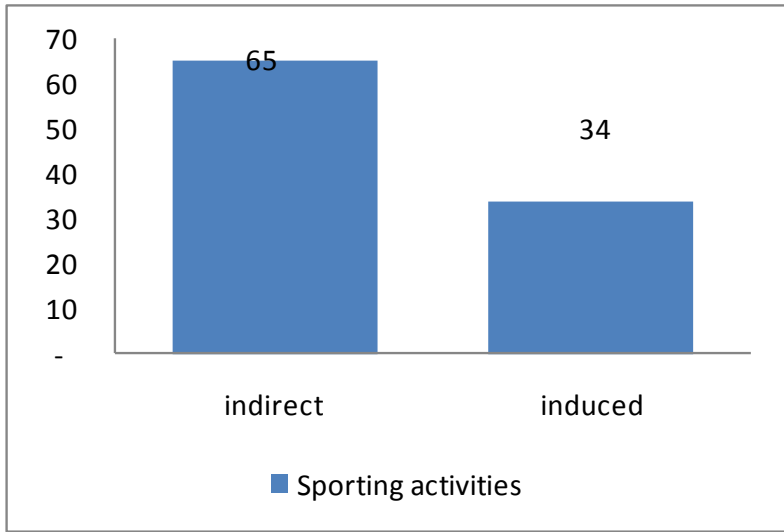


Figure 27: Impact on Taxation (sporting activities)

### 7.10.4 Employment:

The total employment figures created by ICT reached 99 opportunities; 65 as indirect and 34 as induced.





**Figure 28: Impact on Employment (sporting activities)**

**7.10.5 Female Gender Aspect:**

The correlation factor in this activity shows a very good factor that reached 0.77.

**7.10 Activity 9249: Other Recreational Activities:**

**7.11.1 Productivity:**

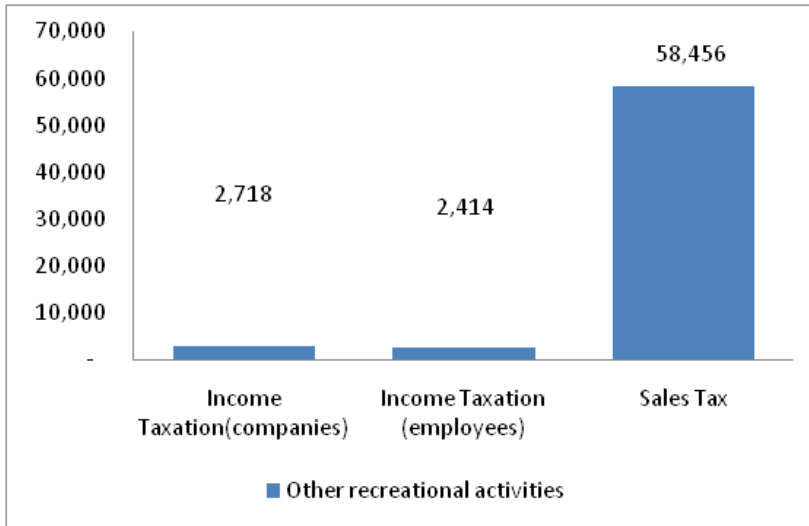
Applying the analyses for this activity shows no significant results for the impact of ICT on productivity.

**7.11.2 Labor Productivity:**

Applying the analyses for this activity doesn't show significant results for the impact of ICT on labor productivity.

**7.11.3 Taxation:**

Regarding the impact on taxes collected from this activity as a result of ICT use, the results show that the impact magnitude was around JD 64,000; the majority came from sales tax.



**Figure 29: Impact on Taxation (Other recreational activities)**

**7.11.4 Employment:**

Due to non-significant results obtained from the regression analysis, no impact on employment could be measured.

**7.11.5 Female Gender Aspect**

The correlation factor in this activity shows a weak and negative value that reached 0.19.

### **7.11 Tourism Sector analysis:**

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

#### **7.12.1 Productivity:**

Regression results show that both ICT index and ICT capital are statistically significant in their impact on tourism sector's productivity. The aggregate impact ratio reached 19.4%, 11.6% comes from the ICT capital while the remaining 7.7% comes from the ICT index.

The sector aggregate impact means that ICT is the responsible for 19.4% of the total change in sector's productivity.

#### **7.12.2 Labor Productivity:**

For the labor productivity impact, results show a unique significant impact for ICT represented by the ICT index impact ratio which reached 16%. Accordingly; ICT diffusion in tourism sector is responsible for 16% change in the labor productivity.

#### **7.12.3 Taxation:**

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

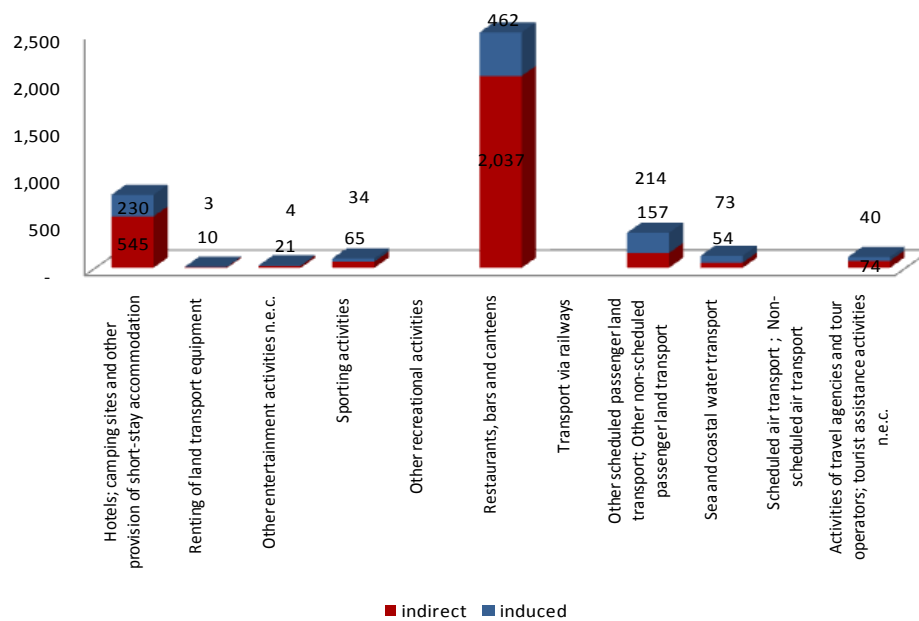
The aggregate impact reached the amount of JD 2.6 million. Around 40% comes from the activity restaurants, bars and canteens, 36% comes from hotels and camping sites. And the highest impact, in terms of tax type, comes from the sales tax in the sector.



**Figure 30: Impact on Taxation (Tourism sector)**

#### 7.12.4 Employment:

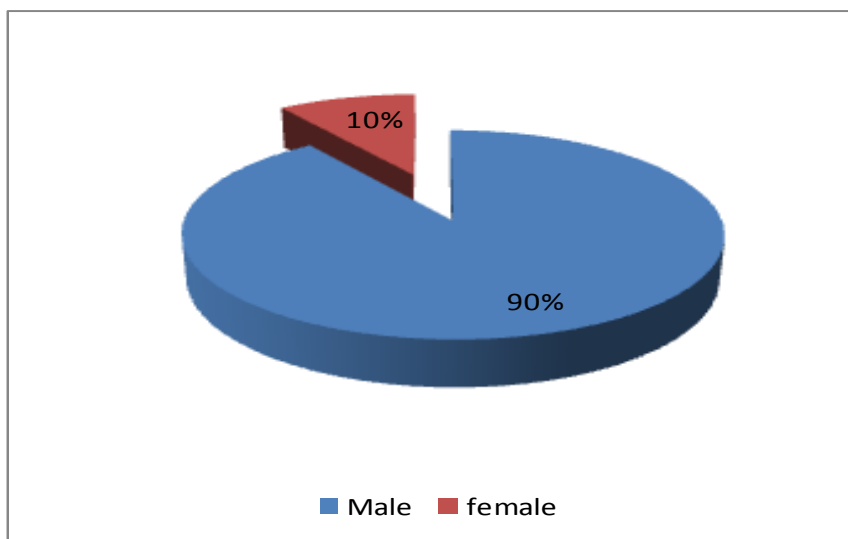
The diffusion of ICT in tourism sector helped at creating around 4000 job opportunities; 2946 as indirect and 1059 as induced. Restaurants, bars and canteens got the first ranking in terms of impact on employment followed by hotels and camping sites activity.



**Figure 31: Impact on Employment (Tourism sector)**

**7.12.5 Female Gender Aspect:**

Results don't show a strong correlation between the ICT index and female ratio employed in tourism sector. On average the factor reached the amount of 0.48. this result could be considered as reasonable due to the small female participation in this sector as shown in the underneath chart. The participation ratio didn't exceed 10% from the total employees working in tourism sector for the year 2007.



**Figure 32: Employment shares in tourism sector for the year 2007:**

Source: DoS, economic survey

### 7.12.6 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 tourism sector caused by ICT diffusion in the sector.

Testing for the impact of ICT in terms of value added was performed for the aggregate level (sector level) not the activity level aiming at looking at the sector as a whole.

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 26.8%; 16.9% came from the ICT capital while the 9.9% came from ICT index.

This means ICT diffusion and expenditure were responsible for 26.8% of the change in value added in tourism sector. Applying this impact ratio for the estimated figures for the year 2008, shows the amount of JD 13.5 million representing around 0.09% from the total GDP for the year 2008.\*

Moreover, this amount constitutes 0.8% from Tourism income for the year 2008.\*\*

(\* Based on CBJ figures for GDP for the year 2008 which stood at the level of JD ≈15 billion)

(\*\* based on MOTA figures for the year 2008, Tourism receipts reached the amount of JD 2.1 billion . (MOTA bulletin))

Relooking at the previous analyses, it can be assumed that the actual impact of ICT on tourism 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 tourism sector and the ICT sector's expenditure on tourism output.
2. Scarcity of ICT diffusion indicators, mainly for the important activities in sector; the size of E-bookings, E-ticketing, the impact of Global Distribution Systems, the expenditure amount on advanced reservation and revenue management systems mainly used by airlines and hotels.
3. ICT may have an impact on innovation, cost saving and environmental aspects which could be covered in detailed surveys. For example, Aircraft manufacturing companies are competing nowadays in delivering high-tech airplanes to reduce maintenance cost, fuel consumption, noise and pollution effect.

## 8 Study Limitations

---

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

### 1. Tourism definition:

The tourism sector is not clearly defined, as it doesn't present a separate sector, it presents a combination of many sub-sectors and accordingly activities. The only possible way to collect the related data to the tourism sector from available data sources was by identifying the sector's related activities according to the ISIC revision3.1.**Data:**

The data limitations were represented by the lack of data in addition to insufficient and inconsistent available data:

- The regression analysis were prepared for the period (1994-2008), this in return affected the regression results and the accuracy level 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 separate them and isolate impact., This may have affected the results accuracy especially when data was available for just one point.
- Different methodologies in collecting data are followed by the different sources; furthermore, classification differences lead to some illogical results in the econometric analyses resulting in less significant 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 from by conducting relevant surveys.

## 9 Recommendations

---

Based on the results 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 in tourism industry to facilitate the access of tourist information by the users and reduce the figures of spilled demand and “no show” cases that resulted from poor forecasting tools or lack of developed systems.
3. Increase ICT awareness in economic sectors and aiming to utilize the positive impact it 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. According to the results obtained from the analyses; ICT can support Tourism in the three main goals mentioned previously in the tourism strategy: Receipts, employment, and taxation.
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. Activate the Tourism satellite account, and input-output matrix 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.



## 10 Appendix:1

---

Specialized committee members for defining and approving tourism:

Name		Position
Ms. Siham Gammo	JTB	director of research department
Ms. Tanya Masadeh	JTB	Economic researcher
Mr. Fayyad Al sukkar	MOTA	Director of information and studies directorate
Mr. Ashraf Matar	MOTA	Director of Tourist Professions' Directorate
Mrs. Yara Abdel Samad	MOICT	Policies and Strategies Director
Ms. Raghda AL faouri	MOICT	Economic researcher

## 11 Appendix 2, ISIC explanation notes (United Nations Statistics Division)

---

- **Class: 5510 - Hotels; camping sites and other provision of short-stay accommodation**

---

### **Explanatory note**

This class includes:

- provision of short-stay lodging in:
  - hotels, motels and inns
  - hotels with conference facilities
  - resorts
  - holiday chalets, cottages and flats
  - student houses, boarding schools
  - hostels for migrant workers
  - camping space and camping facilities, trailer camps
  - other short-stay lodging facilities such as guest houses, farmhouses, youth hostels, mountain refuges (shelters) etc.

This class also includes:

- Operation of sleeping cars when carried out by separate units

*This class excludes:*

- *rental of long-stay accommodation.*
- *operation of sleeping cars as integrated activities of railway companies or other passenger transport facilities.*

- **Class: 5520 - Restaurants, bars and canteens**

---

### **Explanatory note**

This class includes:

- sale of meals for consumption generally on the premises, as well as sale of drinks accompanying the meals, possibly accompanied by some form of entertainment, by:
  - restaurants
  - self-service restaurants such as cafeterias
  - fast-food outlets such as burger bars
  - takeaway restaurants
  - fish-and-chips stands and the like
  - ice cream parlours
- sale of drinks for consumption on the premises, possibly accompanied by some form of entertainment, by:
  - pubs, bars, nightclubs, beer halls etc.
- sale of meals and drinks, usually at reduced prices to groups of clearly defined persons who are mostly linked by ties of a professional nature:
  - activities of sport, factory or office canteens
  - activities of school canteens and kitchens
  - activities of university dining halls
  - activities of messes and canteens for members of the armed forces etc.

This class also includes:

- catering, i.e. activities of contractors supplying meals prepared in a central food preparation unit for consumption on other premises such as the supply of prepared meals to:
  - airlines
  - "meals on wheels"
  - banquets, corporate hospitality
  - weddings, parties and other celebrations or functions
- operation of dining cars when carried out by separate units

- restaurant and bar activities on board ships when carried out by separate units

*This class excludes:*

- sale through vending machines, see 5259
- sale of drinks not for immediate consumption, see division 52
- operation of dining cars as integrated activities of railway companies or other passenger transport facilities, see 6010

- **Class: 6010 - Transport via railways**

---

**Explanatory note**

This class includes:

- passenger transport by inter-urban railways
- freight transport by inter-urban, suburban and urban railways

This class also includes:

- related activities such as switching and shunting
- operation of sleeping cars or dining cars as an integrated operation of railway companies

*This class excludes:*

- operation of sleeping cars or dining cars when operated by separate units, see 5510, 5520
- passenger transport by urban and suburban transit systems, see 6021
- passenger and freight terminal activities, cargo handling, storage and other auxiliary activities, see division 63
- maintenance and minor repair of rolling stock, see 6303
- operation of railroad infrastructure, see 6303

- **Class: 6021 - Other scheduled passenger land transport**

---

**Explanatory note**

This class includes:

- activities providing urban, suburban or inter-urban transport of passengers on scheduled routes normally following a fixed time schedule, entailing the picking up and setting down of passengers at normally fixed stops. They may be carried out with motor bus, tramway, streetcar, trolley bus, underground and elevated railways etc.

This class also includes:

- operation of school buses, town-to-airport or town-to-station lines, funicular railways, aerial cableways etc.

*This class excludes:*

- passenger transport by inter-urban railways, see 6010

- **Class: 6022 - Other non-scheduled passenger land transport**

---

**Explanatory note**

This class includes:

- other non-scheduled passenger road transport:
- charters, excursions and other occasional coach services
- taxi operation

This class also includes:

- other rental of private cars with operator
- passenger transport by man- or animal-drawn vehicles

*This class excludes:*

- ambulance transport, see 8519

- **Class: 6110 - Sea and coastal water transport**

---

**Explanatory note**

This class includes:

- transport of passengers or freight over seas and coastal waters, whether scheduled or not:
- operation of excursion, cruise or sightseeing boats
- operation of ferries, water taxis etc.
- transport by towing or pushing of barges, oil rigs etc.
- rental of ships and boats with crew for sea and coastal water transport

This class also includes:

- transport of passengers or freight via great lakes, requiring similar types of vessels
- rental of pleasure boats with crew for sea and coastal water transport

*This class excludes:*

- restaurant and bar activities on board ships, except when integral part of transportation, see 5520
- cargo handling, storage of freight, harbour operation and other auxiliary activities such as docking, pilotage, lightering, vessel salvage, see division 63
- operation of gambling cruises, see 9249

- **Class: 6210 - Scheduled air transport**

---

**Explanatory note**

This class includes:

- transport of passengers or freight by air over regular routes and on regular schedules

*This class excludes:*

- regular charter flights, see 6220

- **Class: 6220 - Non-scheduled air transport**

---

**Explanatory note**

This class includes:

- non-scheduled transport of passengers or freight by air
- scenic and sightseeing flights
- launching of satellites and space vehicles
- space transport of physical goods and passengers

This class also includes:

- regular charter flights
- renting of air-transport equipment with operator

- **Class: 6304 - Activities of travel agencies and tour operators; tourist assistance activities n.e.c.**

---

**Explanatory note**

This class includes:

- travel agency activities:
- furnishing of travel information, advice and planning
- arranging of made-to-measure tours, accommodation and transportation for travelers and tourists
- sale of packaged tours etc.
- furnishing of tickets
- activities of local tourist information offices and accommodation offices
- activities of tourist guides

- **Class: 7111 - Renting of land transport equipment**

---

**Explanatory note**

This class includes:

- renting and operational leasing of land-transport equipment without drivers:
- automobiles
- trucks, haulage tractors, trailers and semi-trailers
- motorcycles, caravans and campers etc.
- railroad vehicles

This class also includes:

- renting of containers
- renting of pallets

*This class excludes:*

- *renting or leasing of vehicles or trucks with driver, see 6022, 6023*
- *financial leasing, see 6591*
- *renting of accommodation or office containers, see 7129*
- *renting of bicycles, see 7130*

- **Class: 9219 - Other entertainment activities n.e.c.**

---

**Explanatory note**

This class includes:

- production of entertainment n.e.c.:
- activities of ballrooms and discotheques
- activities of dancing schools and dance instructors
- circus production
- activities of amusement parks and amusement fairs
- puppet shows, rodeos, activities of shooting galleries, firework display, model railway installations etc.

- **Class: 9233 - Botanical and zoological gardens and nature reserves activities**

---

**Explanatory note**

This class includes:

- operation of botanical and zoological gardens, including children's zoos
- operation of nature reserves, including wildlife preservation etc.

- **Class: 9241 - Sporting activities**

**Explanatory note**

This class includes:

- operation of facilities for outdoor or indoor sports events (open, closed or covered, with or without spectator seating):
  - football, hockey, cricket, baseball stadiums
  - track and field stadiums
  - swimming pools and stadiums
  - ice hockey arenas
  - boxing arenas
  - golf courses
  - bowling lanes
  - winter sports arenas and stadiums
- organization and operation of outdoor or indoor sports events for professionals or amateurs by organizations with or without own facilities:
  - football clubs, bowling clubs, swimming clubs, golf clubs, boxing, wrestling, health or body-building clubs, winter sports clubs, chess, draughts, domino or card clubs, field and track clubs, shooting clubs etc.
- activities related to promotion and production of sporting events
- activities of individual own-account sportsmen and athletes, judges, timekeepers, instructors, teachers, coaches etc.
- activities of sport and game schools
- activities of racing stables, kennels and garages
- activities of riding academies
- operation of sport fishing preserves
- support activities for sport or recreational hunting and fishing
- related service activities

*This class excludes:*

- *renting of sports equipment, see 7130*
- *park and beach activities, see 9249*

**• Class: 9249 - Other recreational activities**

---

**Explanatory note**

This class includes activities related to recreation not elsewhere classified in this division:

- activities of recreation parks and beaches, including renting of facilities such as bathhouses, lockers, chairs etc.
- operation of recreational transport facilities, e.g. marinas
- motion picture, television and other theatrical casting activities
- gambling and betting activities:
  - sale of lottery tickets
  - operation (exploitation) of coin-operated gambling machines
  - operation (exploitation) of coin-operated games
  - operation of gambling cruises
  - operation of virtual gambling web sites
- fairs and shows of a recreational nature

This class also includes:

- renting of leisure and pleasure equipment as an integral part of recreational facilities

*This class excludes:*

- *activities of personal theatrical or artistic agents or agencies, see 7499*
- *other entertainment activities, e.g. circus production or activities of ballrooms, see 9219*

## 12 References:

---

- Badnjevic, J. (2006): ICT Awareness in Small Enterprises in the Indian Tourism Branch, IT University of Göteborg, Sweden.
- <http://unstats.un.org>
- web statistics, <http://www.almanar.jo>.
- Dos web published data, <http://www.dos.gov.jo>
- <http://www.ilo.org>
- <http://www.unwto.org>.
- Milne, S. Mason. D, et.al: (????). NZ Accommodation Providers & ICT: Impacts on Labor Use & Demand.
- Shanker, D. (2008) : ICT and Tourism: Challenges and Opportunities, Indian Institute of Technology.  
CBJ, yearly statistical series,  
[www.cbj.gov.jo/pages.php?menu\\_id=136&local\\_type=0&local\\_id=0&local\\_details=0&local\\_details1=0&localsite\\_branchname=CBJ](http://www.cbj.gov.jo/pages.php?menu_id=136&local_type=0&local_id=0&local_details=0&local_details1=0&localsite_branchname=CBJ)
  
- 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](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)
- MOTA, Annual bulletins, MoTA, [http://www.tourism.jo/GuestBook/Statistics\\_ar.asp](http://www.tourism.jo/GuestBook/Statistics_ar.asp)