Services Intensities in the Iranian Economy: An Input-Output Approach

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Abstract

Service sector plays an important role in Iran economy; so that in the recent years the vale added of services sector can allocate more than 50 percent of the gross domestic output. Even though, perception to service sector is different in the process of development, but at the present time dominant sector of the global economies is service sector. In despite of higher share of service sector in Iran economy, the mentioned sector has been all the time interpreted as a nonproductive sector by some of policy makers and researchers. It seems that, such these perceptions in the case of service sector could not show a realistic image of the importance and role of this sector in the situation of economic evolutions. In this paper, the authors will try to introduce an index by estimating Direct Services Intensity and Direct plus Indirect Services Intensity in the framework of input-output in order to evaluate interrelation of service sector, specially sub-sectors of manufacturing service with other sectors and sub-sectors of industry in Iran economy. The mentioned study sets on 2001 input-output table of Statistical Center of Iran. The results of this paper show that 28.3 percent and 27.3 percent of economic activities in 2001 in the view of intensities of direct service and intensities of direct service and indirect service placed in the category of key sectors of Iran economy. Therefore, the intensities of service in Iran economy are more or less remarkable.

Keywords: Service Sector, Tertiary Sector, productive services, Direct Services Intensity, Direct plus Indirect Services Intensity, Input-output Table.

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Introduction:

With developing economy of Iran, the share of service sector in the gross domestic output and employment [1] was higher than other sectors in the economy. Also, the statistics and comparative studies of structural changes in Iran economy show that the growth of the share of service sector in the gross domestic and national output and employment to other sectors during time (Azad, et al, 2010, Azad, 2008, Banouei et al. 2010), but the view of decision makers about this sector is always negative because of dominant structure of mediatory ; although, nowadays, this sector is one of the productive and profitable sectors in the world and this sector can play a special role in improving economic system of the country (management and planning Organization, 2005:435). Above statement reveals present duality attitude toward service sector in the economy of Iran. On the other hand, there is not only a positive attitude toward this high share of service among policy makers of the country and they think of it as non-productive sector, but also the role and significance of the mentioned sector haven't been considered in the literature of economic development seriously. Lack of subdividing of services sector into different varieties made suitable requirements and policies meaningless. It seems this kind of view about service sector can't get a real image of performance of various activities in this sector in the terms of economic changes especially in the era of service-oriented economy regarding its new classifications, definitions, and concepts. There are at least two drawbacks: first, misunderstandings have been made because of some nominal similarities of trends with industrial countries. Secondly, all kinds of sectors have been treated in the same way. On the other hand, productive and profitable attitude is one of its distinctive instances regarding knowledge-based economy in the fourth development plan of Iran. Explaining being productive and profitability of service sector is possible when definitions, concepts, and new classifications of the mentioned sector are presented; so that it can have common language with global economic evolutions and especially being post-industrial, info-economy, and services-oriented economy. Studying these dimensions without presenting a new classification of services sector is not easily possible. For this reason, the territory of activities of services sector will classified into four sub-sectors of productive services, distributive services, personal services and social services.

In this paper with a concise study of structural changes of Iran economy in recent 50 years, for the first time direct services intensity and direct plus indirect services intensity of Iran economy in the framework pattern of standard input-output and based on 2002 input-output table of Statistical Center of Iran will be calculated. Direct services intensity vector calculates the share of utilized services to the whole production and direct plus indirect services intensity vector calculates the share of utilized services to the final demand which can be a guideline for planning in services sector for determining internal structure of economy which has been reflected by input-output links. The contents of this paper will be organized in five sections. In the first section, theoretical and historical aspects, new definitions and concepts of services sector and its classification will be presented. In the second section structural changes of Iran economy during 1962-2008 periods will be studied. In the third section, methodology of direct services intensity and direct plus indirect services intensity in the form of standard input-output pattern and its statistical bases will be stated. In the fourth section results achieved and its analyses and finally at the fifth section, summary and conclusion of this paper will be presented.

1- New concepts and classifications of service sector and literature review of the study

Although present literature shows that there is no standard and acceptable definition of service sector; however, some economists since late1930s until now such as Fisher, Clark, Chenery, and afterwards Kuznets tried to explain the structure of economy in form of major economic sectors: primary sector (agriculture and mining), secondary sector (industry, civil, and supplying water, electricity and gas) and tertiary sector [2] (service) evaluated structural changes based on stage theory of development (Park and Chan 1982:20-2). In framework of these types of analyses, service sector and related activities are considered as waste for long. It means such activities that have no specifications of primary and secondary sectors are considered as services in the service sector (Daniels, 2004: 115). Because of developments in world economy in 1970s and especially in 1980s such as petroleum shock and the emergence of new terms such as service economy, de-industrialization or reindustrialization, post-industrialization, and information economy has provided the basis for classified triple reforms of Fisher-Clark and Chenery-Kuznets type about structural changes. Economists such as Katouzian (1970), Gershuny and Miles (1983), Park and Chan (1989), Miles and Boden (2000) have tried to bring up the role and importance of tertiary sector in classification and explanation of subsectors of service sector in form of various terms

and definitions such as productive services, distributive services, social services, and personal services or in from of modern services, classic services and complementary services, knowledge services or information services. The main purpose of such these classifications was to differentiate all the various activities with different functions which are called with a general title of "services" and encounter difficulties in the evaluation of development levels with considering the global economic changes.

The basis of studies and methodologies of the Service intensity are the studies regarding energy intensity which all are done in 1980s and afterwards (Proops (1988), Mukhupadhyay & Chakraborty (2005) & Oyeshola F. Kofoworola and Shabbir H. Gheewala (2006)). Late studies abroad show that the services intensity as a basis can be useful tools in the service sector planning. Rita Bhowmik (2000) initially has studied structural developments of economy of India in the form of a comparative static analysis which shows that in Indian economy the share of value added of primary sector in GDP is decreasing and the share of value added of secondary sector in GDP is increasing; and then she calculated the direct services intensity and direct plus indirect services intensity of Indian economy. Her studies on 60 sector input-output table of India (1991-1992) are done in the form of a static analysis and after calculating modern links of above table she has compared the service sectors with non-service sectors. The results of her work show that 25 sectors of 60 sectors of Indian economy have a direct service intensity and 31 sectors of 60 sectors of Indian economy have direct and direct plus indirect services intensity higher than the average of whole economy, and also sub-sectors of services (commerce, other services and transportation) of Indian economy have the highest levels of modern links (Bhowmik, 2000, pp.168-4). S.k. Hansda (2001) while observing the same development in different sectors of Indian economy in the form of a comparative static study in Indian economy (in the span of 1950-2000) has a static analysis on 115-sectors input-output table of Indian economy (1933-1994) using modern economic links and services intensity (Hansda, 2001, p 84-85, 90-4). Bhowmik in 2003 in a new try with calculating direct services intensity, direct services and direct plus indirect services intensities, and correlation coefficient of their rates has analyzed the static comparative results of 6 input-output tables. Her goal form of these analyses is to study the role and importance of tertiary sector and its quad sub-sectors in Indian economy and the relation of this sector with other sectors with the help of input-output analysis. The results of her study show that almost in all 6 tables of metallic production sector; commerce, machinery, and

banking affairs has the highest rates of direct services intensity, direct and direct plus indirect services intensity and correlation coefficient (Bhowmik, 2003, pp.429-34).

2- Structural developments of Iran economy in the span of 1962-2008

The extent of research in service sector of Iran will be recent 50 years; because it is along with codifying of Iran national accounts and development plan of Iran [3].

Before this period, in our society which basically a considerable number of people have lived in a rural areas or have lived traditionally in agriculture field and had their own appropriate culture, and there was no accurate statistics and information for national accounts, employment, and etc. But, during last five decades many occurrences had been taken place to change these bases (Azimi, 2005:103).

Diagram no.1 shows the process of value added share of primary economic sectors and the diagram no.2 shows the value added share of quadric service sector and table no.1 shows the average value added share of economic activities of Iran according to major economic sectors based on national accounts of Statistical Center of Iran during 1962-2008.

Figure 1 - the share of value added economic activities in major economic sectors times gross domestic product at constant prices for the years 1997 to 1961-2006 (percent)
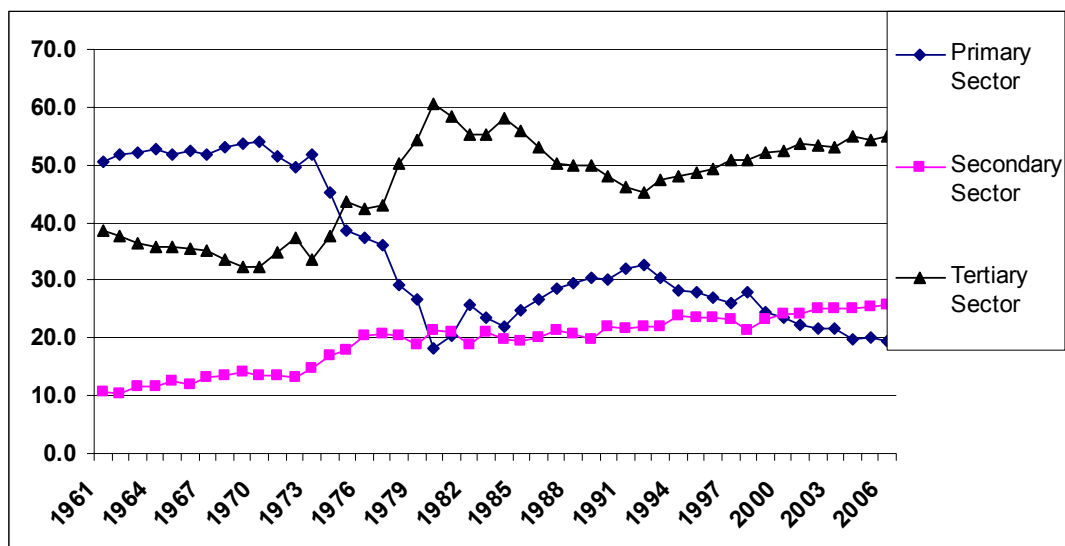
Considering table no.1 and diagrams no.1 and 2, the process of structural changes of triplet economic sectors and quadric sub-sectors of service sector of Iran economy can be studied based on huge researches done by Azimi (2005), Katouzian (1996), and Azad (2008) in six periods of Iran political, social and economic development and changes as follow:

1 – First period (1962-1973): This period can be called as the period of development of economic entities or reformation; in this period which two plans of third and fourth five year plans of construction development had been executed and it was along with transitions like White Revolution and Land Reform. Infrastructural investments like: dam construction, steel, power plant, road construction, etc. and also concurrency with world's growth flow, and aggregation of physical assets remained from political, social, and economic changes of World War II are the other characteristics of this period. As seen in diagram no.1, in this period the value added share of primary sector in GDP is higher than the other major economic sectors such as secondary and tertiary sectors. The average share of each sectors in GDP are: primary sector is 52.1%, secondary sector is 12.5%, and third sector is 35.4% with considering some other criteria which has been mentioned in previous section, it can be said that Iran in this period has been placed in the first phase of development. Also, about the sub-sectors of tertiary sector (diagram no.2) till 1970, the distributive service sector has the highest importance but after that year, the social service sector has the highest share in GDP and in its service sector, this is so because of the expansion in the role of government in service sector (Azad, 2008:27).

2- Second Period (1974, 1978): This period can be called as mass consumption period or increasing petroleum revenues; from September of 1973 Iran faced explosion of petroleum revenues. Mass consumption is one of the characteristics of developed countries, but in case of Iran because there were no proper formation of cultural, social, political and economic entities, this period caused an extensive poverty of vulnerable strata and led to more welfare of plutocrat strata and finally it led to social crises. The revenue sources of Iran in mass consumption period (1974- 1978) were from selling petroleum and not from non-petroleum revenues, and because the country did not have the potency for absorbing plenty of foreign exchange due to increasing

petroleum price, it caused huge import, high liquidity and inflation and economic crisis has formed [4]; and these are some of the reasons behind 1978 revolution in Iran. In this period, we face an increase in the share of service sector in GDP. This increment in the share of tertiary sector has occurred since 1976 and its reason was because of exploding in oil revenues and developing a special type of service, and especially it was so because of mediated in Iran economy (Katouzian, 1996:333). Therefore, increases of foreign exchange reserves and extensive import of goods and especially consumer goods and capitalism consequences (exploding in petroleum price) have had a positive effect on value added of commerce, transport, and storekeeping (distributive services), and therefore on service sector. But, social services have the highest share among sub-sectors of service sector in this period. In this period there is always along with decreasing share of primary sector and increasing share of secondary and tertiary sector (Azad, 2008:27).

Table no.1: The average of value added share of economic activities of Iran according to major economic activities and quadric sub-sectors of service sector in domestic gross production in selected periods to fixed prices of 1998 (percentage)

Table1- The average share of value added economic activities of major economic activities and times of four sub-service sectors in gross domestic product in selected periods in 1997 constant prices (percent)

| Sector Year	Primary Sector	Secondary Sector	Tertiary Sector	Producer Services	Distributive Services	Personal Services	Social Services
1961-1972	52.10	12.50	35.40	2.80	18.60	1.50	12.50
1973-1978	41.80	18.10	40.10	3.90	16.50	1.60	17.90
1979-1988	25.10	20.30	54.70	8.40	21.50	2.30	22.50
1989-1996	29.80	22.30	47.80	11.70	21.10	2.20	12.80
1997-2004	23.40	23.90	52.60	14.60	24.00	2.30	11.80
2004-2006	19.80	25.60	54.50	14.90	27.30	2.50	9.90
1961-2006	**34.30**	**19.20**	**46.50**	**8.40**	**20.80**	**2.00**	**15.30**

Reference: Statistical Center of Iran (2008) the 1991-2006 periods of national accounts current and constant prices

Source: Results have been obtained based on national accounts of Iran in period of 1962-2008 (Statistical Center of Iran, 2008,9) and classification of major economic sectors and quadric sub-sectors of service sector (Azad, 2008, p.57, and 62)

3- Third Period (1979, 1984): This period is the period of revolution and 8- year Iran-Iraq war. In 1979 revolution, Iran entered the structure-making period for an idealistic society but before that, it reached somewhere, Iraq invaded Iran and the war occurred. One of the mentionable points about sub-sectors of service sector in this period is a noticeable rise in value added share of social services sector during first years of this period (1979-1984), and it happened because of the expansion of government role in the economy and especially about social security and high defense and security expenses during war, and also the expansion of public health and education and rural development.

Diagram no.2- The value added share of economic activities is based on quadric sub-sectors of service sector in domestic gross production during 1962-2008 to fixed prices of 1998 (percentage) Productive services, Distributive services, Personal services, Social services.

Figure 2 - the share of value added economic activities subsectors four times gross domestic product in the service sector in the years 1961-2006 to 1997 constant prices (percent)
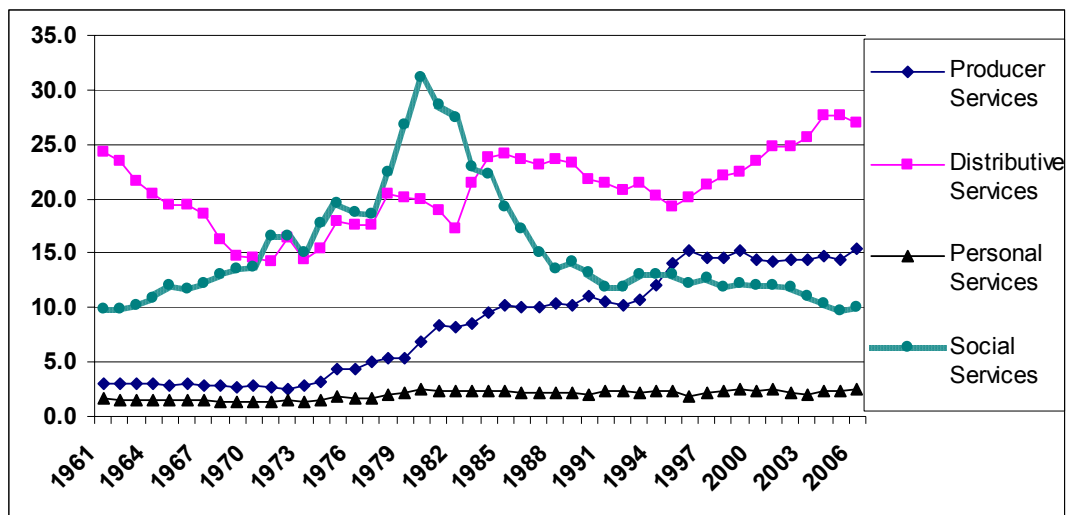
Reference: Statistical Center of Iran (2008) the 1991-2006 periods of national accounts current and constant prices

Source: Derived results are based on national accounts of Iran during 1962-2008 period (Statistical Center of Iran, 2008,9) and classification of quadric sub-sectors of service sector (Azad; 2008, p.62)

4- Fourth period (1990-1997): In this period from cogitative view, we almost enter a period which is similar to the period of 1962-1973 and there was this belief that Iran can reach development with an extensive investment on road construction, factory building, dams, etc. Some scholars called this era as "construction period" because of efforts to compensate war damages which it seems the term "rebuilding" is more appropriate. In this period, Iran has faced crises such as terrible weakening value of national currency, and its outcomes and unfinished projects caused by lack of noticing institution-making (Azimi, 2005, p.106-108). In this period again tertiary sector has the highest share among major economic sectors. But, with considering its own process, it has a decreasing process in its share; as the average share of primary sector reaches 29.8%, and secondary sector to 22.3%, and tertiary sector reaches 47.8%. Also, distributive services have the highest share among sub-sectors of services sector and other sub-sectors of major economic sectors (Azad, 2005, p.105).

5- Fifth Period (1998-2005): During this period, some slogans for social-cultural development and forming civil-society have been introduced which faced some economic problems due to a decrease in petroleum price in 2000 (Azimi, 2005:109). In this period for the first time, the share of productive services in GDP has become higher than social services share in GDP which one of its reasons can cause development of job opportunities and employment environment during it. In recent studies, Banoueie, Momen and Azad (2010) with using framework of input-output table of France, Britain, Germany, Italy, Japan, Iran and India evaluated replacement between productive and distributive services which observed that with increasing the level of development, the importance of productive services are more than distributive services in developed countries; although, in developing countries economy (such as Iran and India) exactly opposite conclusion is true.

6- Sixth Period (2006-2008): In these years, some slogans in the favor of social and economic justice have introduced. In this period, service sector and its quadric sub-sectors have been continued their progress.

According to above observations, some below observations can be achieved:

i- Regarding social, political and economic changes in these six periods, it has been observed that, averagely the share of primary sector to the whole value added has

decreased from 52.1% in first period to 19.8% in second period. Opposite of mentioned process was observed for the secondary sector. As the average share of it to the whole value added from 12.5% in first period has increased to 25.6%. Therefore; it was observed that the average decrement in share of primary sector is more than average decrement in the share of secondary sector.

ii- The average share of value added of tertiary sector to the whole value added of economy has increased from 35.4% in the first period to 54.5% in the sixth period.

iii- If criterion of 50% average of value added of each triple economic sectors to the whole value added is considered as a scale for entering economy to a service-oriented economy, the results of table.1 show that Iran economy in the fifth period has nominally entered a new phase which is known as services-economy today [5].

iv- Period of 1979-1984 with 54.7% average of tertiary sector was allocated to itself the highest value added share to other periods. This share in next period decreased and again in next periods has been increased. The mentioned period because of Islamic revolution atmosphere and also because of war situation has been exempted from other periods and can be not represented for entering to service economy. One of its reasons can be political decisions in allocating assets which led to development of activities of service sector and especially social services, and distributive services.

v- If tertiary sector (Services) will be studied in the form of quadric sub-sectors, processes and functions of service sector in periods under study would be more transparent. The average share of distributive services in whole economy and whole services in all periods under study has been more than average share of productive services, personal services, and social services. Second and third periods are excluded which the average social services in whole services are more that share of other sub-sectors of services. This question that why social services has allocated highest share compared to other sub-sectors of services in the mentioned periods to itself, according to the authors of this article it can be caused by two reasons. First, especial situation of dominant environment in this period (sudden increase of petroleum price, occurrence of Islamic revolution, and afterwards war situation) and second, development and expansion of services, and especially social services have a great

dependence to political factors which are generally placed out of function and mechanism of market.

3- Methodology and statistical bases:

With the help of description of methodology in this section, it has been attempted to evaluate the share of utilized services in various sectors of industries and also service intensity for manufacturing various industries or manufacturing service intensity in an economy.

Definitely, input-output analysis will be in the best framework for evaluating the share of utilized services in manufacturing because relation between various sectors of economy can be studied accurately.

General form of input-output relation is as below:

$$X_i = \sum_j X_{ij} + F_i \qquad i,j = 1,2,\ldots,n$$

Here X_i shows whole amount of production which has been produced by ith sector and X_{ij} shows production or goods and service by ith sector for production of jth sector or demand for intermediate trades, and F_i production of goods or services for production of ith sector which is directly can be reached by consumer or is final demands of ith sector.

If all of the production relations assumed as proportional and then the amount of inputs to the sectors will be proportional and share to the whole production of that sector will be:

$$X_i = a_{ij} X_j$$

Here a_{ij} are technical coefficients, with the help of above relation; the general input-output relation can be presented as:

$$X_i = \sum_j a_{ij} X_j + F_i$$

In symbol of matrix: X=AX+F   (1)

Which in this relation X is the vector of gross industrial, A is the matrix of technical coefficients of input-output, and F is final demand vector.

Relation (1) can be solved from side of gross industrial as a balance relation of input-output:

$$X = (I - A)^{-1} F \qquad (2)$$

Which in here I is unit matrix and $(I - A)^{-1}$ is Leontief reverse matrix. This matrix points the whole needed production for each sector of economy. X is goods manufactured and produced services for final consumer as F.

Service intensity can be evaluated with various methodologies as below. Definite percept is that the demand for services is derived from manufacturing and it is dependent to this matter that utilized services intensity as index various definition from various view point can be considered as below: Net services intensity, gross services intensity, end-use intensity, manufacturing services intensity, non-manufacturing services intensity, industrial services intensity. Here two fundamental definitions of services intensity can be presented (Proops, J. L.R 1988 & Bhowmik, R 2000& 2003). The first type of direct industrial services intensity which is calculated from the share of utilized industrial services in production of S_{ind} to final demand F. first methodology $CX = S_{ind}$ and second methodology is $C*F = S_{ind}$

Here vector C is the direct services intensity, in fact it is necessary utilized productive services for producing one unit of goods or services by each sector and C* vector is the direct and direct plus indirect services intensity, in fact shows necessary utilized direct and indirect productive services for producing one unit of goods or services by each sector that allocated to final demand of the same sector. For calculating C, the whole utilized productive services distribute between productive sectors. The ith sector can buy S_i services for its production process. According to this, the whole productive services of whole productive sectors in the economy can be shown in this form:

$$S_{ind} = \sum_i^n S_i$$

The whole production of this sector shows with X_i and therefore C can be defined as below:

$$C_i = \frac{S_i}{X_i}$$

The share of vector C* can be calculated from C relation:

CX = S_{ind} (3)   and

C*F = S_{ind} (4)

With substituting relation (3) in relation (2) for X variant, relation (5) as follow can be achieved:

$$C(I - A)^{-1} F = S_{ind} \qquad (5)$$

With comparison or relation (4) with relation (5), the relation (6) as follow can be achieved:

$$C* = C(I - A)^{-1}$$

C vector shows the utilized direct services intensity of various industries in their productions and C* vector shows direct and direct plus indirect services intensity of various industries in their productions.

In this paper 2002 square or symmetric table of input-output of Iran economy with current price and having 99 sectors of economic activities (99*99) based on technological hypothesis of those sectors (activity) which has been calculated by Banouei et al. (2008) based on original 2002 input-output tables of Statistical center of Iran i.e. Use table or Absorption matrix 147*99 (99 sectors of activities in 147 goods) which has been done in the form of a research project in Center of economic researches of Iran at economics college of Alameh Tabatabaei University, has been used.

4- Results and its analysis:

According to relations no.3 and 6 of the previous section of this article, C vector "direct services intensity" and C* vector "direct and direct plus indirect services intensities of 99 sectors input-output table of 2002 has been calculated [6], which its results can be seen in table no.2. First and third columns of table no.2 show C which is "direct services intensity" and C* which is "direct and indirect services intensities" respectively, and columns no.2 and

4 of this table respectively show ranking of sectors based on C and C*. Analyses if this section are based on a synthetic classification of common classification which has been used by analyzers such as Fisher (1933), Clark (1940), Chenry (1960 &1986), Kuznets (1965), Gershany and Miles (1983), and Park & Chan (1989). Classification of major economic sectors will be done based on separation of activities of whole economy into three sectors, primary sector, secondary sector and services according to classification of major economic sectors based on stage theory of development of Fisher, Clark, Chenry, and Kuznets (Katouzian, 1970:363), which activities of primary sector classified into agriculture and mining including petroleum and natural gas extraction, and secondary sector classified into industries related to agriculture, energy industries and infrastructural industries including supplying water, electricity, and gas, and construction (Chenry et al. 1986:113). Service sector also has been separated into four sub-sectors of productive services, distributive services, personal services, and social services (Park and Chan, 1989: 201, 2).

Table 2 -Direct services intensity and direct plus indirect services intensity of 2010 table of Iran

No of sectors of activities	Sectors of activities	C	Ranking	C*	Ranking
1	Farming	0.009	66	0.017	68
2	Gardening	0.026	18	0.034	20
3	Agricultural services and poultry	0.034	14	0.046	14
4	Animal Husbandry	0.013	48	0.024	45
5	Aviculture	0.007	81	0.021	61
6	Beekeeping and Sericulture and hunting	0.030	16	0.024	18
7	Forestry	0.022	23	0.029	30
8	Fishing	0.021	24	0.032	22
9	Coal and Lignite mining	0.005	90	4	77
10	Natural gas and petroleum extraction	0.009	72	0.010	92
11	Ironstone mining	0.010	61	0.016	69
12	Copper stone mining	0.003	95	0.008	96
13	Construction stones and material mining	0.018	36	0.026	37
14	Mining other metallic mineral and nonmetallic minerals	0.009	73	0.013	79
15	Manufacturing all types of oils and greases	0.005	89	0.016	71
16	Manufacturing of other food products and beverages	0.009	70	0.026	39

17	Manufacturing products from Tobacco	0.004	93	0.009	94
18	Manufacturing textiles	0.011	52	0.025	43
19	Manufacturing cloths, treating and coloring furry leather	0.019	29	0.026	36
20	Tannery and leather currying, suitcase, handbag, saddle and stripe manufacturing, and manufacturing all types of footwear	0.013	46	0.022	53
21	Manufacturing wood and wooden products, and manufacturing goods from cane and bamboo	0.009	71	0.023	47
22	Manufacturing paper and papery products	0.014	43	0.028	33
23	Printing, copying, and publishing recorded media	0.020	26	0.023	24
24	Manufacturing refined petroleum products, and coal and manufacturing atomic energy	0.008	77	0.014	74
25	Manufacturing chemical materials and products	0.008	74	0.014	73
26	Manufacturing rubber and plastic products	0.011	53	0.023	48
27	Manufacturing glass and glassy products	0.013	47	0.023	48
28	Manufacturing other nonmetallic minerals products which are not classified in other sectors	0.011	50	0.026	35
29	Manufacturing basic products of Iron and steel	0.010	59	0.025	40
30	Manufacturing basic copper products	0.004	92	0.010	91
31	Manufacturing basic Aluminum products	0.004	94	0.031	26
32	Manufacturing other basic metallic products and metallurgy	0.010	57	0.023	49
33	Manufacturing metallic products except machineries and equipment	0.010	62	0.021	58
34	Manufacturing machinery with general usage	0.005	88	0.009	93
35	Manufacturing machinery with special usage	0.002	97	0.007	97
36	Manufacturing furniture	0.007	80	0.018	66
37	Manufacturing office, accountancy, and calculation machinery	0.049	6	0.054	9
38	Manufacturing machineries and electrical utensils which are not classified in other sectors	0.008	76	0.016	70
39	Manufacturing radio, television, and other communicational devices	0.006	87	0.010	90
40	Manufacturing medical instruments	0.007	82	0.010	88
41	Manufacturing optical instruments and instrumentation, wrist watches and other types of watches	0.001	98	0.004	99
42	Manufacturing motor vehicles, trucks and mini-trucks	0.011	55	0.012	56
43	Manufacturing other types of transportation means	0.006	83	0.014	76
44	Furniture Manufacturing	0.018	34	0.031	27

45	Manufacturing other types of products which are not classified in other sectors and recycling	0.002	96	0.014	75
46	Manufacturing, transmission and distributing electrical power	0.091	2	0.0143	2
47	Refining and distributing natural gas	0.008	75	0.013	82
48	Collecting, treating, and distributing water	0.018	33	0.033	21
49	Residential buildings	0.029	17	0.044	17
50	Other types of buildings	0.033	15	0.005	17
51	Wholesale and retailing	0.014	44	0.022	52
52	Repairing motor vehicles, motorbikes and personal and home devices	0.014	45	0.021	60
53	Public residencies	0.050	4	0.067	3
54	Eateries and bars	0.009	65	0.021	57
55	Railway transportation	0.011	51	0.019	65
56	Passenger road transport	0.021	25	0.023	25
57	Cargo road transport	0.006	85	0.013	85
58	Transport through pipes network	0.010	58	0.028	31
59	Sea transport	0.009	67	0.022	54
60	Air transport	0.026	19	0.049	13
61	Help and support services of transportation	0.024	22	0.034	19
62	Post and telecommunication	0.007	79	0.013	78
63	Banking	0.057	3	0.065	5
64	Other financial brokerages	0.047	7	0.052	10
65	Insurance	0.231	1	0.296	1
66	Personal residential unit services	0.000	99	0.004	98
67	Rental residential unit services	0.004	91	0.009	95
68	Non-residential unit services	0.018	35	0.026	34
69	Real state agencies and tenement services	0.036	12	0.044	16
70	Hiring machineries and equipment without operator and hiring personal goods and home furniture	0.006	84	0.011	89
71	Computers and related activities	0.024	21	0.028	32
72	Research and development	0.025	20	0.032	23
73	Other job and work activities	0.018	31	0.024	44
74	Managing public affairs	0.017	37	0.023	50
75	Urban services	0.011	54	0.017	67
76	Defensive affairs	0.009	68	0.013	83
77	Disciplinary affairs	0.009	64	0.014	72
78	Mandatory social security	0.047	8	0.054	8
79	Governmental elementary education	0.010	60	0.013	84
80	Private elementary education	0.049	5	0.065	4
81	Governmental high school education, government vocational and technical education	0.009	69	0.021	87
82	private high school education, private vocational and technical education	0.043	10	0.056	7

83	Governmental higher education	0.015	42	0.022	55
84	Private higher education	0.018	32	0.023	46
85	Governmental education of Adult and others	0.012	49	0.021	59
86	Private education of adults and others	0.035	13	0.045	15
87	Governmental Hospital related activities	0.006	86	0.021	86
88	Other governmental health and medical activities	0.019	30	0.029	29
89	Private hospital related activities	0.007	78	0.013	81
90	Private Medical and dental activities	0.016	39	0.020	62
91	Other Private medical and health activities	0.015	21	0.040	64
92	Veterinary	0.009	63	0.013	80
93	Social work	0.019	28	0.029	28
94	Political religious services	0.010	56	0.025	41
95	Cinema, radio, television and other artistic activities	0.019	27	0.026	38
96	News agencies	0.037	11	0.050	12
97	Library, museum and other cultural activities	0.016	28	0.020	63
98	Sport and recreational activities	0.043	9	0.057	6
99	Other services	0.015	40	0.023	51
Average		0.019		0.029	

Source: results have been derived based on 2002 input-output table (Banouei et al. 2008) and using relation no.3 and 6 of the third section of this paper.

With analyzing results which are derived from table no.2, below general observations can be achieved:

i- Research findings show that direct services intensity in service sector from 0.01% in personal residential unit services (66) has reached 23.05% in insurance sector (66) and direct plus indirect services intensity form 0.014% in manufacturing optical instruments and instrumentation, wrist watches and other types of watches (41) has reached 29.65% in insurance sector (66). Interesting point is that in C "direct service intensity" and also in "C*" direct plus indirect service intensity the highest rank is of insurance sector (66) and the lowest ranks are from personal residential unit services sector and manufacturing optical and instrumentation, wrist watches and other types of watches (41) sector. These variations are clearly due to changes in manufacturing and technology.

ii- Findings of table no.2 show that 28 sectors out of 99 sectors have direct services intensity higher than the average direct services intensity of the whole economy i.e. 0.019 and 27 sectors out of 99 sectors have direct plus indirect services intensity higher than the average direct plus indirect services intensity of the whole economy i.e. 0.029. Results show that the services intensity of Iran economy is somehow remarkable.

iii- Also, 18% of key sectors from direct services intensity view point i.e. those sectors which have direct services intensity higher than the average direct services intensity of whole economy are sub-sectors of primary sector, and 18% are sub-sectors of secondary sector and 64% are sub-sectors of services sector. 15% of key sectors from direct plus indirect service intensity view point i.e. those sectors which have direct plus indirect service intensity higher than the average direct plus indirect service intensity of whole economy are sub-sectors of agriculture and mining sectors and 30% are sub-sectors of industry, supplying water, electricity power, gas, and construction sectors and 56% are sub-sectors of third or services sector. Therefore, the services intensity of Iran economy among services sectors is more remarkable.

iv- Findings of table no.2 about four sub-sectors of services sector present noticeable points. 21% (6 sector of 28 key sector from direct services intensity index view point) including banking (63), other financial brokerages (63), insurance (65), real states agencies and tenement services (69), and research and development (72), and also 19% (5 sectors of 27 key sectors from direct plus indirect service intensity view point) including banking (63),), other financial brokerages (63), insurance (65), real states agencies and tenement services (69), and research and development (72) are sub-sectors of productive services. Sub-sectors of social services, personal services, and distributive services are placed in subsequent degree of importance of C and C*. Therefore; it seems, evaluating economic services of Iran to the other input-output economic links will show the importance of productive services to the other economic links in a more proper form, and this point is according to development levels theory and theories of services economy [7].

5- Summary and conclusion:

This paper has tried to evaluate the role of services sector in Iran economy with help of evaluating utilized services in various sectors of economic activities and also services intensity for manufacturing various industries or productive services intensity and in meanwhile has tried to explain structural evolutions in Iran economy.

The results of comparative static analyses of national accounts of Statistical Center of Iran in period of 1962-2008 which include six period of remarked political, social and economic evolutions shows that in first period (1962-1973) of social, political and economic evolutions, Iran economy is in first phase of development which the share of primary sector is higher than secondary and services sector. Second period (1974-1978) or period of increasing petroleum revenues reveals structural changes of Iran economy, it means the share of primary sector decreased and the share of secondary and services sector have been increased which relative increase of services sector share is higher than relative increase of industry sector share. In third and fourth periods political, social, and economic evolution have happened, progress of structural changes of Iran economy is similar to second period. If 50% criterion of average value added is considered as a scale for economy to enter into a service oriented economy, Iran economy in fifth period nominally entered into a new phase which is known as service economy today; and progress of structural changes in Iran is similar to the other developing countries [8]. But structural changes in four sub-sectors of services sector shown a different image in studied period; it means, distributive services in all periods except in second period, (1974-1978) and third period (1979-1989) which the role of social services are higher, has the dominant role in all sub-sectors of services in production of all economy of Iran. Productive services in all of these six periods have ascendant progress, as fifth period (1998-2005) its average share has been higher than the average share of social services which one its reason can be development of business environment in Iran economy in this period and this procedure has been continued in sixth period (2006-2008) too. Social services in first and second periods of changes have ascendant process and in second and third periods averagely have the highest share among economic sub-sectors, but in fourth and fifth period the evolution shows a descendant process. Results show a relative stability of personal services share in all these six periods.

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Results of evaluating services intensity of Iran economy show that in 2001for both the C direct services intensity and C* direct plus indirect services intensity the highest rank has been from insurance sector (66) and the lowest rank have been from personal residential unit services (66) and manufacturing optical instruments and instrumentation, wrist watches and other types of watches (41). These changes clearly are due to evolution in manufacturing and technology. Also, 28.3% of economic activities have had direct services intensity higher than the average direct services intensity of whole of the economy i.e. 1.9% and 27.3% of economic activities have had direct plus indirect services intensity higher than the average direct plus indirect services intensity of whole of the economy i.e. 2.9%. Therefore; somehow services intensity of Iran economy is remarkable.

This paper can present a guideline for planning of service sector for determining internal structure of economy which has been illustrated through input-output links. These links will be determined by merging technology with industrial infrastructures. This study has specific application for planning and forecasting in service sector which is based on schematization and change structure of demand, services, and technology on and intersectional exchanges.

C and C* vectors has specific application for planner of service sector. These vectors can be useful tools for planning in service sector as basis. C vector calculates the share of utilized services to the whole production X. where C* calculates the share of utilized services to the final demand. If planners calculated the amount of final demand for each sector in an economy for describing the state of technology and industrial development by Lenitive technical matrix of input-output A, this calculation could be combined with C* vector for a separate description of productive services demand which is necessary for planning of final products and services demand. Even if there will be a need of more details about various industrial services, personal industrial services intensity can be defined in a similar method.

In fact, these techniques give a tool to strategists and planners that with developing those sectors which have higher direct services intensity develop economy generator and productive services and with developing some sectors of economy which have direct plus indirect services intensity create the basis for increasing final demand (personal and public use, investment, and public foreign trade) of sectors which prepare a base for developing generator and productive services in the society.

Notes:

[1]. based on 10 years employment distribution and most of the censuses of 1987, 1997, and 2007, the employment share of service sector is higher than the other major economic sectors, as in public census of 2007, more than 50% of employees of the country are working in the tertiary sector (intangible activities) which itself is an index of entering into service economy (Azad, 2008:102)

[2]. the title of tertiary sector has been given to the services activities by Fisher in 1933 and 1939; and in his view "idealistic" was basically differentiate between services and agricultural and industrial activities (Kumar and Mathur, 1996, p.35)

[3]. the first development plan (construction) of Iran has been started in 1949, but because there are no official statistics of national accounts in the first two development plan of Iran, evolutions has been studied since 1962.

[4]. mass consumption is one of the characteristics of developed industrial countries, but second period of Iran economy due to high import of consuming and luxury goods and abnormal increasing of consumption which was because of exploding petroleum revenues has been called "mass consumption" period and in fact, has different characteristics compare to developed countries. The combination of mass consumption with abnormal growth of services sector especially brokerages, relying on petroleum revenues, anti-production entities, being luxurious of knowledge, excessive dependency along with dependency to the passed way, excessive poverty and underdevelopment along with dualities are the important factors of this period.

[5]. similar to the experiences of development phases of developing countries, Iran too has been nominally entered third phase of development without passing through second phase of development. Developed countries have experiences of second and third phases of development based on developing productivity power, and in fact, they have had the experiences of second and third phases of development completely. But developing countries such as Iran, because of relying on solo-product economy, exogenous factors, and specific cultural and social traits have had nominally the experience of third phase of development.

[6]. in 99 sector input-output data table, primary sector (sectors no. 1 to 14 of table) includes sub-sectors of agriculture (one to 8), and sub-sectors of mining (9 to 14), and secondary sector includes sector no.16 to 50 of table which sub-sector of industry includes two groups of agricultural-dependent industries (15 to 21) and basic and energy industry (21 to 45), infrastructural group including supplying water, electricity power, and gas (46 to 48) and building (49 to 50), and tertiary sector

includes sectors no.51 to 99 of table has been separated to productive services (63 to 77), distributive services (51 and 55 to 62), personal services (52 to 54 and 95 to 99) , and social services (74 to 94).

[7]. in theories of development levels and services economy it has stated that with increasing of development levels, the importance of productive services will be higher than distributive services. For further information please refer to (Miles and Boden 2000:1-7), (Banouei et al. 2010), (Azad, 2008), (Management and planning Organization, 2005:95).

[8]. for further information of process of other developing countries please refer to: (Ansari, 1995:234-7), (Kumar and Mathur, 1996:42-48), (Bhowmik, 2000:164), (Hansda, 2004:84-84), and Management and planning Organization, 2005:95

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