THE IMPORTANCE OF SECTORAL INTERLOCKING OF THE MANUFACTURING INDUSTRY IN ACHIEVING ECONOMIC DEVELOPMENT IN IRAQ

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Received:	20th August 2024	The sectoral interconnection of the manufacturing industry is of great importance in the national economy, as it shows the level of forward and backward interdependence between the branches of the manufacturing industry, The topic also acquires importance by standing on the nature of the overlapping relationships between economic activities and knowing the levels of this overlap. The index of forward and backward links for the manufacturing sector recorded fluctuating and unstable data, and the reason is the ineffectiveness of manufacturing activities and its weak contribution to the GDP. This conclusion comes from the state's orientation and dependence on the outside world and the opening of the door to import, and thus the decline of the local industry to the level that this study came out with. The best evidence for this is what the study found of a significant weakness in the front and back pull links of the manufacturing sector with other economic activities.
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INTRODUCTION
The manufacturing industry is an important pillar of the national economy in both developed and developing countries because of its important role in the production process. As the development of this sector will reflect positively on all sectors of the national economy, and that the manufacturing sector is characterized by its reciprocal relations with the rest of the other sectors because it is the sector responsible for the production of goods and services. Accordingly, the manufacturing sector means the ability to transform raw and intermediate materials into final goods, that is, suitable for final use. Since the national economy is divided into several productive sectors that are linked to each other by interlocking relationships, and to determine the nature of these relationships, the user-producer table can be used because it is a record that shows the picture of intertwining in the manufacturing sector and the rest of the other sectors of the economy. Achieving economic development requires studying sectoral interdependence and identifying structural imbalances and addressing them in a manner that raises the efficiency and performance of these sectors.

CHAPTER ONE/ THE CONCEPT AND IMPORTANCE OF INDUSTRIAL ENTANGLEMENT
First / The Concept Of Industrial Interlocking
Industrial entanglement is one of the important factors in the economy, and its importance is highlighted by influencing the analysis and understanding of the volume of current transactions between different industrial activities, and the extent to which each industrial activity depends on other industrial activities. It also expresses the relationships between inputs and outputs and thus contributes to defining production and creating added value. The interlocking relationship of the national economy is one of the descriptive and analytical tools for the economic structure and a systematic attempt to clarify the flows of goods and services between different economic units and activities. **[1]** The process of sectoral intertwining also means subjecting the phenomenon of overlap to partial analysis in order to know the reciprocal processes and flows between the various industrial branches in a quantitative manner to contribute to the analysis of the current industry situation and to determine its potential picture. As well as seeking closer interconnection between its branches on the one hand and between them and other economic sectors on the other hand **[2]** .

Second / cases of sectoral intertwining
The input-output tables include the division of the national economy into several sectors, and through this table it is possible to identify the nature of the relationships and interconnections that exist between the industrial branches during the production process. We deduce from the columns and rows of the table several cases of sectoral intertwining as an expression of the intertwined economic relations between the industrial branches. As well as knowing the quality of the

correlations, as it is natural for the structure of the national economy to be determined in light of the volume of transactions between different sectors, which are reflected by the large number or lack of cells of the matrix of technical transactions, as it means transactions of importance between sectors **[3].** Accordingly, the degree of sectoral intertwining increases as the number of cells that contain important transactions in the matrix of technical transactions increases. Among the most important types of industrial interlocking known from the input-output tables:

1- case of full specialization

This type of intertwining means that there is only one economic interrelationship between each branch of industry separately. That is, for example, there is a relationship between the leather industry and leather processing sector, and because such industries represent different stages of the production process, so they are merged into one sector. Therefore, it is combined into one sector, which is the leather industries sector. We can see this kind of intertwining in vertical integration industries, where we find each industry selling its products to one industry, and at the same time obtaining its production requirements from one other industry **[4].**

FROM \ TO	1	2	3	4
1	0	x12	0	0
2	0	0	x23	0
3	0	0	0	x34
4	x41	0	0	0

From the diagram, it can be seen that the third sector needs production requirements from the second sector, while the fourth sector needs production requirements from the third sector. That is, each sector needs or uses the products of one sector only and sells or finances the products of one other sector.

2- The state of complete entanglement

What is meant by this type of interlacing is the existence of a complete interrelationship between industries, meaning that each industry obtains the necessary inputs for production from the rest of the other industries and from the industries themselves, as well as it sells its production to all other industries, meaning that the entire state of intertwining, It appears when the cells of the matrix of technical parameters of production are filled, or the value is greater than zero and less than one, Accordingly, production in each of these industries is based on the use of the products of other industries as well as the industry itself. The production of each industry is used by the rest of the industries, including the industry itself, in the production process **[5].**

FROM \ TO	1	2	3	4
1	x11	x12	x13	x14
2	x21	x22	x23	x24
3	x31	x32	x33	x34
4	x41	x42	x43	x44

3- The case of random entanglement

This situation appears mostly in developing economies, which are characterized by a small amount of diversification in the production apparatus, It shows a contraction and decline in many of the reciprocal relations between the productive activities in the national economy, That is, the industry in this kind of intertwining may have a relationship with other industries, In the sense that it is not necessary to be highly dependent on industries or other sectors, and this can be seen from the following matrix **[6]** .

FROM \ TO	1	2	3	4
1	x11	0	0	x14
2	0	x22	0	x24
3	x31	x32	0	0
4	01	0	x43	x44

We note that sector (1) buys production requirements from the same sector and from sector (3), while it sells its products to sector (1) itself and sector (4) as well as the rest of the sectors .

3- The state of complete industrial entanglement

In such a case, several forms of relationships can be observed. There are industries that depend for their production on requirements from other industries. At the same time, the rest of these branches do not depend on their products, and accordingly, this industry is characterized by strong back interlocking and weak frontal interlocking, and the following matrix can be observed **[7].**

FROM \ TO	1	2	3	4
1	x11	0	0	0
2	x21	x22	0	0
3	x31	x32	x33	0
4	x41	x42	x43	x44

Secondly/ the importance of industrial entanglement

Input-output tables are of great importance in the economy, as they constitute an important tool in making economic decisions by knowing the size of the interrelationships between the various sectors and economic branches, Which led to the expansion of the use of these tables in various aspects of analysis, planning, and economic forecasting:

1- Utilizing the input-output table in setting and defining the production targets for the branches and industrial sectors, As it prepares for the authors of the economic plans, a disclosure that depicts the state of industrial entanglement, and the extent of the ability of the industrial branch to establish such relations, knowing the production requirements for each branch, and the possibility of providing them locally or importing them from abroad. Therefore, it is possible that such tables provide a balance between the available resources for production purposes and production, and the consequent treatment of bottlenecks that may occur due to the lack of raw materials needed for production **[8].**

2- Input-output tables contribute to the process of economic analysis through the matrix of young production coefficients and their inverse, It is also possible to benefit from this matrix, to know the relative importance of the contribution of each industrial branch in the production of one unit of a particular industry.

3- Benefiting from the input-output tables in analyzing production structures, as it is possible through them to determine the status of the existing economic structure, And then identify the necessary ways to achieve the final goal, and also possible to identify the leading sectors in the national economy. **[9].**

4- These tables are used to know the role played by the foreign trade sector in the economy in terms of its presentation of the reality of the country's imports and exports. Which gives the economic planner the opportunity to develop the planning process for foreign trade in line with the objectives of economic development **[10].**

5- The process of identifying technical transactions reflects the relationship between the ratio of intermediate use to the value of total production, The economic planner can control the distribution of income, the higher the ratio, the more this indicates the existence of a labor-intensive productive art, and vice versa, it is capital-intensive. Accordingly, the country that suffers from scarcity of capital will focus on the industrial branches that use high labor intensity.

6- Through the input-output tables, it is possible to determine the extent to which the labor component contributes to the production of one unit of the various products of the industry, Therefore, in the event of an increase in investment allocations for different industries, there will be an ability to face this increase and the possibility of expanding job opportunities for this industry. And the expansion of these industries, will lead to an increase in the creation of employment opportunities in the rest of the industries that have intertwined relations in the production processes **[11].**

Chapter Two/ sectoral intertwining of the manufacturing industry

It is possible to distinguish between two types of interdependence, which are the forward links, which mean the reciprocal relations that occur between the industrial branch and other branches of the manufacturing industry. Which this branch supplies with raw materials, intermediate goods, or services that are included in the production process of those branches. The other type is the background connections, as they refer to the relationship between an industrial branch and other industrial branches that supply it with production requirements. The forward correlations of the industrial branch can be calculated by summing the elements of each row from the inverse matrix, As for the background correlations, they can be calculated by summing the elements of each column of the inverse matrix. **[12]**

First/ the frontal Attract links

The forward correlations show the extent to which industrial activity in the manufacturing sector is able to fuel economic activities. Whether in the manufacturing sector or in other sectors. The front links for the manufacture of machines, equipment, tools and electrical equipment reached (3.86), The industrial chemicals industry came in the other rank, as the strength of its forward links with other economic activities reached (3.31). The table also shows the strength of the forward links of the basic mineral industries activity with other economic activities. It came in third place and is equal to (3.24). We conclude from the other data that the forward correlations of the activities of the manufacturing sector with the sectors of the economy in general are not at the required level. It does not reflect the importance and effectiveness of this sector in providing other sectors of the economy with production requirements. This conclusion comes from the fact that the industrial sector in Iraq has lost its effectiveness and its real role in supplying the national economy . Because of the neglect that affected this important sector and it became unreliable in light of the almost absolute dependence on the revenues of the oil sector **[13] .**

Frontal attraction links in the sectors of the Iraqi economy for the year 2010 million dinars

total forward links	the product the user	sequence
30.48246408	Electricity, gas and water supply	1
17.27244739	Extraction of crude oil and natural gas	2
10.04265613	oil filter	3
9.353681515	Wholesale and retail trade and repair of motor vehicles	4
5.599556364	Transportation, storage and communication	5
3.869108158	Manufacture of machinery, equipment, tools and electrical equipment	6
3.314900141	(Industrial chemical industry (other than oil refining	7
3.241309408	basic metallurgical industries	8
2.920303598	Agriculture, forestry	9
2.757324491	Real estate activities and rental of machinery and equipment that are not occupied by an employee	10
1.821124326	Manufacture of wood and its products and cork, except for furniture	11
1.807889936	Construction and building	12

1.759779549	Manufacture of grain milling products, starch and starch products	13
1.6071681	Manufacture of manufactured metal products other than machinery and equipment	14
1.598159375	Paper and paper products industry	15
1.592239017	financial intermediation	16
1.567238245	Spinning, weaving and textile processing	17
1.512769515	Rubber and plastic products industry	18
1.494717203	Manufacture and repair of agricultural machinery and equipment	19
1.47294833	Other types of mining	20
1.409103431	Cement, lime and plaster industry	21
1.401289607	Manufacture of non-metallic minerals not classified elsewhere	22
1.321419042	Manufacture of machinery and equipment other than electrical	23
1.266015602	Other chemical products industry	24
1.245746075	Other manufacturing industries	25
1.167130502	(Milk products industry (dairy products	26
1.089951208	Manufacture of leather, leather products and shoes	27
1.085326576	Printing, publishing and reproduction of recorded media	28
1.067665654	Auto industry	29
1.062613676	Hotels and restaurants	30
1.037878354	Manufacture of unclassified textiles and ready-made garments	31
1.029085458	Other community, social and personal service activities	32
1.025728722	Glass and glass products industry	33
1.021205968	Fishing	34
1.012656004	Manufacture of animal and vegetable oils and fats	35

1.012514003	Furniture Industry	36
1.003887788	Meat, fish, fruit and vegetable processing and preservation industry	37
1.001204283	Manufacture and repair of other means of transport	38
1.000652691	Beverage, tobacco and liquor industry	39

Calculated based on the user-product table for the year (2010) issued by the Ministry of Planning, Central Agency for Statistics and Research   [14]

Second / backlinks of attraction

The back connection of industrial activity is defined by what it receives of production requirements from other branches. When we look at the back-end attraction links of the manufacturing industry, we find that there is a clear fluctuation in the level of this interdependence. Some branches of industry recorded an advanced rank in the mentioned attraction ties, foremost of which is the wood industry and its products, The back attraction links amounted to (4.76) dinars. This value represents what this industry needs in terms of production requirements from other economic branches to meet one dinar of the final demand on the products of this branch. The paper industry and paper products ranked second in terms of back links with other branches, which amounted to (4.47) dinars. And also the manufacture and repair of agricultural machines, as the strength of the back links amounted to (4.37) dinars. And the fluctuation continues in the backlinks of the rest of the manufacturing industry activities with other economic sectors. This fluctuation in the strength of the back links is due to the fluctuation in the effectiveness of these industrial activities and the decline of their role in raising the efficiency of the Iraqi economy.

Backlinks of attraction in the sectors of the Iraqi economy for the year 2010 million dinars

Total backlinks	the product the user	sequence
3.10412	Electricity, gas and water supply	1
1.13263	Extraction of crude oil and natural gas	2
2.97269	oil filter	3
2.1659	Wholesale and retail trade and repair of motor vehicles	4
2.55343	Transportation, storage and communication	5
4.08454	Manufacture of machinery, equipment, tools and electrical equipment	6
2.80356	(Industrial chemical industry (other than oil refining	7
4.18808	basic metallurgical industries	8
2.3533	Agriculture, forestry	9
1.25257	Real estate activities and rental of machinery and equipment that are not occupied by an employee	10
4.76097	Manufacture of wood and its products and cork, except for furniture	11

2.5565	**Construction and building**	12
3.49323	**Manufacture of grain milling products, starch and starch products**	13
3.6777	**Manufacture of manufactured metal products other than machinery and equipment**	14
4.47194	**Paper and paper products industry**	15
1.39894	**financial intermediation**	16
4.16878	**Spinning, weaving and textile processing**	17
3.55939	**Rubber and plastic products industry**	18
4.37853	**Manufacture and repair of agricultural machinery and equipment**	19
2.40988	**Other types of mining**	20
3.06113	**Cement, lime and plaster industry**	21
2.90254	**Manufacture of non-metallic minerals not classified elsewhere**	22
3.80814	**Manufacture of machinery and equipment other than electrical**	23
3.67747	**Other chemical products industry**	24
4.34526	**Other manufacturing industries**	25
3.99329	**(Milk products industry (dairy products**	26
3.50761	**Manufacture of leather, leather products and shoes**	27
2.30539	**Printing, publishing and reproduction of recorded media**	28
3.22094	**Auto industry**	29
1.86955	**Hotels and restaurants**	30
3.94428	**Manufacture of unclassified textiles and ready-made garments**	31
1.79539	**Other community, social and personal service activities**	32
4.28937	**Glass and glass products industry**	33
2.40507	**Fishing**	34

4.16916	Manufacture of animal and vegetable oils and fats	35
3.47989	Furniture Industry	36
4.04948	Meat, fish, fruit and vegetable processing and preservation industry	37
4.25706	Manufacture and repair of other means of transport	38
3.78114	Beverage, tobacco and liquor industry	39

Calculated based on the user-product table for the year (2010) issued by the Ministry of Planning, Central Agency for Statistics and Research   [15]

We conclude from the statistics of the forward and backward correlation tables that they reflect the weakness of the sectoral interlocking of the manufacturing activities. This is because the manufacturing industry in Iraq faced several challenges, the most important of which is the absence of a clear industrial strategy and objectives as a result of the neglect it suffers in light of the great openness to the outside. In addition to the inability of industrial products to compete in foreign markets, and the consequent threat to the structure of the industrial sector, which was not rehabilitated after 2003, and the lack of competitive elements for it and making it more able to adapt to regional and global economic changes.

One of the most important characteristics of the Iraqi economy is the excessive dependence on the oil sector as a main source of income and a funder of most other economic activities. Consequently, the adoption of ineffective industrial policies, which leads to a loss of coherence between the stages of production, as the manufacturing industry in Iraq is characterized by the weakness of the intermediate industry, And the confinement of industrial projects to the production of consumer goods, on the other hand, the local manufacturing industry's dependence on imported technology to a large extent, including technology related to production methods and means, And thus the high costs of industrial production in light of the great weakness in the industrial infrastructure, in a way that the industry is not equipped to meet the desired goals of this effective sector.

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