

Research on the path of synergetic development between logistics industry and the leading industry in Fujian province

Qiaoping Mei^a, Qi Jiang and Li Yang

Department of Logistics, Fuzhou University of International Studies and Trade, Fuzhou 350202, Fujian, China

Abstract. Logistics industry is closely related to other industry, the synergetic development between logistics industry and leading industry is benefit for leading industry to reduce costs, improve efficiency and promote industrial upgrading. This book analyzes the association of logistics industry and leading industry on the basis of the input-output tables of Fujian and proposes advises to promote their synergetic development based on the calculation.

1 Introduction

During the period of 11th Five-Year Plan Fujian adjust the industrial structure and initially form large-scale industrial clusters taking electronics, machinery and petrochemical as leading industry. The added value of the leading industry in 2010 is 220.432 billion yuan, increase 26.3% and elevate 14.9 percent over the previous year, accounting for 36.4% of the above-scale industrial added value, The three leading industries realize a total profit of 45.832 billion yuan, up 56.9% over the previous year and faster than the average level of the province, Contribution rate to the profit growth of above scale industries is 37.8%. Obviously, the economic development of Fujian mainly depends on the leading industries. As a Productive service industry, Logistics industry is the foundation of the national economy with the effect of creating jobs, promoting production, stimulating consumption and promoting industrial restructuring, accelerating the transformation of the mode of economic development and enhance the competitiveness of the national economy, logistics services an link for others, the efficiency and effectiveness of logistics operations is an important manifestation of the competitiveness of leading industry. Domestic scholars have many research about the logistics industry and related industries, for example Li Guanlin (2001) ^[1] analyzes the input-output of China's logistics industry based on 1997 statistics, Jun Ruan et al. (2007) ^[2] uses the input-output method to analyze the modern logistics industry of Fujian Province, and pointes out the strategy of further development of the logistics, Wang Yan (2010) ^[3] summarizes the characteristics and trend of China's logistics industry from the nature of the logistics industry.

This paper studies the association analysis between logistics industry and the leading industry of Fujian province based on the 2007 statistics, and put forward countermeasures about promoting the linkage development of logistics industry and the leading industry in Fujian province according to the analysis results, which is the innovation of this paper. In addition, the three leading industry plays a great contribution to the development of economy, the three leading industries of Fujian province have been formed, but the development of the logistics industry still need coordination, so it has great

^a Corresponding author : 460903976@qq.com

theoretical and practical significance to study the linkage development path of logistics industry and the leading industry of Fujian province.

2 Effect analysis between logistics industry and leading industry in Fujian

Industrial linkage refers to technical economic ties of the connection link of various inputs and output products between industries, industrial correlation analysis is called input-output analysis method (referred to input-output method). Input-output analysis analyzes the input-output relationships of the various parts of the economic system (as an industrial sector production units or consumption units, industries, products, etc.)

Based on the 2007 input-output tables of Fujian Province, this paper merges the railway transportation industry, road transportation industry, maritime transportation industry, air transportation industry, handling and other transportation services, etc. into logistics, While the communications equipment manufacturing, computer manufacturing, electronic components manufacturing industry, home audio-visual equipment are consolidated into electronic information manufacturing, metal processing machinery manufacturing, other general equipment manufacturing, rail transportation equipment manufacturing, automobile manufacturing, ships and floating equipment manufacturing, electrical machinery manufacturing are regarded as machinery and equipment manufacturing.

Oil and natural gas industry, petroleum and nuclear fuel processing industry, special chemical products manufacturing, chemical fiber manufacturing are merged into petrochemical industry. Then we calculated on the basis of the divisions.

2.1 Direct consumption coefficient analysis

In the basic flow table, provided x_{ij} is the total output in the production process, $a_{ij} = \frac{x_{ij}}{X_j}$ is called

direct consumption coefficient, which represents producing unit product of j industrial sector need value of direct product consumption of the i industrial sector. Suppose the national economy have n sectors, the direct consumption coefficient of the industries a_{ij} is composed by $n \times n$ order matrix, which we denoted A .

Table 1. Direct consumption coefficient between Logistics and leading industries of Fujian Province in 2007.

	Electronic information industry	Equipment manufacturing	Petrochemical industry	Logistics industry
direct consumption coefficient of Logistics to other industries	0.013726	0.015120	0.016095	0.056631
direct consumption coefficient of other industries to Logistics	0.036509	0.042261	0.027066	0.056631

According to the input-output tables of Fujian Province in 2007.

The data in Table 1 shows that the logistics industry needs to consume itself 566.31 yuan, petrochemical 160.95 yuan, machinery and equipment manufacturing 151.20 yuan, electronic information industry 137.26 yuan, when the total output of the logistics industry increase ten thousand yuan, indicating the development of the logistics industry has a very significant effect in promoting leading industries. The total output of electronics, machinery, petrochemicals respectively consume 365.09, 422.61, 270.66 when they increase ten thousand yuan, in fact, the direct consumption of each industry on logistics is logistics costs that they produce production units product. Obviously the

logistics costs of equipment manufacturing is the highest, this means that logistics costs account for a large proportion of the cost of the equipment manufacturing, the main reason is that logistics is one of the basic indemnification for normal production of equipment manufacturing enterprises, and it is an important part throughout the entire process of production and sales of businesses. The logistics in procurement, production, sales, recycling and waste disposal of equipment manufacturing are difficult to coordinate, resulting in a significant cost of waste. The logistics costs of electronic information industry take second place, the reason is that the product value of the electronic information manufacturing is relatively high, the logistics requirements is also higher, also the logistics of electronics manufacturing starts relatively late, which indicating the province should improve the information degree of logistics and improve internal, external information systems. Promoting the upgrading of the logistics management level of Information manufacturing will have a very important significance by using the specialization of logistics.

2.2 Influence coefficient and sensitivity coefficient analysis

We have an industry that is the extent of the impact of other industries called sensitivity, and the impact of an industry level is called the influence of other industries. Productive activities of an industrial sector will inevitably affect and be affected other productive activities by correlation between industrial sectors. We call the extent of the impact of a industry by other industries sensitivity, and call the impact of an industry on other industries influence power.

According to Leontief inverse matrix, let S_i denote the Sensitivity coefficient of i industry sector, T_j indicate the influence coefficient of j industry sector, then:

$$S_i = \frac{\sum_{i=1}^n \overline{b_{ij}}}{\frac{1}{n} \sum_{i=1}^n \sum_{j=1}^n \overline{b_{ij}}} \quad (i, j = 1, 2, \dots, n)$$

Industry sensitivity reflects the sensing capability of a industry on various industrial sectors of the national economy. This sensing capability represent the direct and indirect pull capability of the national economy to the industry. The higher the industry sensitivity and sensitivity coefficient are, the greater the pull effect from the national economy, the industry will have the nature of Basic industry and bottleneck industry.

Industrial influence reflects the influence ability of the change of final product of an industry on the total output of the entire national economy. This influence ability manifest the direct and indirect promotion of capacity of the industry on national economic development. The higher the influence and influence coefficient are, the greater driving force the industry to the national economic development will be, developing these industries will make "multiplier" effect on economic growth.

Table 2. Influence coefficient and sensitivity coefficient between logistics and the leading industries of Fujian in 2007.

	Electronic information industry	Equipment manufacturing	Petrochemical industry	Logistics
influence coefficient	1.717459	0.586473	0.864848	1.44181
sensitivity coefficient	1.676967	0.655711	1.354258	1.70247

According to the input-output tables of Fujian Province in 2007.

Table 2 shows the sensitivity coefficient of logistics is 1.70247, indicating Pull effect of the leading industries on logistics in Fujian is large. influence coefficient of logistics is only 1.44181, higher than the average level of society, so logistics has great function in promoting development of

regional economic, We should give priority to develop it. We can know that sensitivity coefficient of logistics to leading industries is greater than industrial influence by contrast, namely the pull of the development of leading industries to logistics is greater than the promotion logistics to leading industries, so Fujian should better develop leading industries and take some initiative measures.

2.3 Intermediate demand rate and intermediate inputs rate analysis

Intermediate demand rate is the proportion of an industry's intermediate demand to total demand, the higher the intermediate demand rate is, the industry will more have the nature of providing the intermediate product. Intermediate input rate is the proportion of an industry's intermediate inputs to the total investment, reflecting the size added value of industry.

Table 3. Intermediate input rate and Intermediate demand rate between industry and leading industries of Fujian in 2005.

	Electronic information industry	Equipment manufacturing	Petrochemical industry	Logistics
Intermediate input rate	0.507531	0.257896	0.316928	0.257087
Intermediate demand rate	0.466352	0.224018	0.572154	0.692625

According to the input-output tables of Fujian Province in 2007.

The data in Table 3 shows that the intermediate input rate of industry in Fujian to leading industries is 25.7087%, which indicated that intermediate demand rate of production of the logistics to other industrial product is not high, and the proportion of added value created by logistics is higher. So it is obviously to find that the logistics of Fujian plays an important basic role in the process of regional economic development. Intermediate demand rate is 69.2625%, it indicates that logistics of Fujian has a characteristics of being a strong basic industry, that is to say that as a service industry, logistics is to provide services for the development of leading industries. The development of various industries highly need logistics to provide services for them.

3 Path analysis of promoting interactive development of logistics and leading industries of Fujian

Through the input-output analysis, we can see the logistics in Fujian has a certain degree of development, logistics and leading industry contact closely, the development of leading industry needs coordination of logistics, in turn leading industry will promote the development of logistics. Leading Industry make outstanding contributions to the economic development of Fujian, measures to promote interactive development of modern logistics and leading industries are as follows:

3.1 Common path of interactive development of the logistics industry and Leading Industry in Fujian

3.1.1 Develop the third-party logistics of three leading industries vigorously

Electronic information industry is a technology and capital intensive industry with various kinds of product and fast upgrading. Production and distribution of product require a higher level of logistics services, while the supply chain of electronic information products require a higher level of supply logistics of raw materials, such as sorting, packaging, reasonable transportation stowage, accuracy and timeliness warehousing, etc., which resulted in high logistics cost of electronic information industry.

Logistics is one of the basic indemnity to normal production of equipment manufacturing enterprises which is an important part of the entire production and sale process throughout business. Procurement, production, sales, recycling and waste disposal of equipment manufacturing

industry are difficult to coordinate effectively, resulting in tremendous waste of cost. Direct consumption coefficient of logistics of Fujian petrochemical industry is relatively low and their correlation is not great, the reason is that development logistics outsourcing of domestic petrochemical enterprises is slow, most enterprises not only are engaged in production, sales business, but also has their own fleet, warehouse, which restricts the development of third party logistics.

Today, most companies have a serious shortage of resources, improving resource utilization become a prerequisite for business survival. As market competition becomes intensified and social division is refined, for related businesses of leading industry, using third-party logistics services can reduce costs, improve customer level, increase flexibility, improve production efficiency, make business owners focus on and improve the professional level of logistics, thus developing third-party logistics is an inevitable trend for related enterprises of three leading industries.

3.1.2 Enhance the ability of logistics enterprises

Developing the leading industries of Fujian should enhance the ability of logistics enterprises. The direct consumption coefficient of logistics in Fujian is the highest, indicating its low operational efficiency, therefore strive to enhance the capabilities of logistics enterprises in Fujian is necessary. First, we should guide and support the logistics companies update logistics management concepts, and actively penetrate the professional field, extending logistics services; improve service function, and innovative service models by high quality, efficient, low-cost objectives and careful studying the production and operation mode of businesses and logistics requirements; promote the innovation of applied technology and mechanization, automation, standardization of logistics facilities, constantly optimize the service and information network to improve service levels. Second, focus on fostering some competitive large-scale logistics enterprises of higher level of service. Merger and restructure small businesses in the industry with the principle of optimal allocation of resources, expand the concentration ratio of logistics market and improve operational efficiency of the logistics. Third, encourage and guide the logistics enterprises in Fujian to participate in the comprehensive assessment of the national A-class logistics enterprises. Implement brand strategy to enhance the operation and management level of logistics enterprises. Fourth, encourage and guide logistics enterprises to actively expand the international logistics channels, carry out high-end logistics service based on multinational business, expanding service area, and gradually provide logistics information planning, management consulting and other value-added services in order to better serve for the leading industries.

3.2 Specific path of interactive development between Logistics and Leading industries in Fujian

3.2.1 Electronic information manufacturing enterprises remain to identify core competitiveness and choose service providers correctly.

Sensitivity coefficient of logistics on electronic information manufacturing is less than industry influence, namely the promotion of logistics on electronic information manufacturing is greater than the pull of electronic information manufacturing on logistics, so Fujian should better develop electronic information manufacturing, the development level of logistics largely depends on the aggregation and release of logistics demand of manufacturing. In recent years, logistics of manufacturing has achieved rapid development, concepts of modern logistics and management techniques gradually popularize, but it is still a weak link of the development of service industry. So we must pay attention to synergetic development of manufacturing and logistics, manufacturing must identify their core competencies and objectives and conditions of logistics outsourcing, choose the right logistics service providers.

3.2.2 Improve application level of information systems of equipment manufacturers and related logistics businesses.

Partition coefficient reflect the product,s proportion and flow logistics sectors, machinery and equipment manufacturing is only 4.2427%, indicating that there are 4.2427% logistics service flows to machinery and equipment manufacturing,so we should expand investment of machinery and equipment manufacturing in logistics.The tools that produced for other services industries by machinery and equipment manufacturing have large universality and pertinence, there is no uniform standard that the same type of device will has large difference because of different manufacturers, the characteristic of mechanized equipment can not be destined to have a great amount, so mechanical parts of mechanical equipment are difficult to form the bulk, which lead to high logistics requirements, the corresponding logistics companies can build logistics information system to improve their reaction capacity and provide better services for enterprises.In addition to the establishment of the system by business between the network and the supplier or the customer has no specific business integration planning, Information level of enterprise in the area of product development,materials management,financial management,office automation is high,while it is low in area of supply chain management, E-commerce, customer relationship management,which is the reason that prevent interactive development between logistics and machinery and equipment manufacturing.

3.2.3 Provide customized logistics solutions by improving service capacity of logistics enterprises

Correlation between logistics and petrochemical industry is not large, mainly because the development of logistics enterprises in petrochemical Industry is slow, which is unable to meet the logistics needs of petrochemical enterprises, the development of logistics outsourcing of petrochemical enterprises in Fujian is slow, most businesses are both engaged in the production, sales, and has its own fleet, warehouse, restricted the pace of development of this third-party logistics industry.While self-operate logistics consume investment of enterprises, but some had to operate logistics themselves from the safety and security point.So logistics enterprises should provide customized logistics services according to the requirements of petrochemical enterprises, and constantly improve their service capacity to contribute to the development of petrochemical industry.

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