

**INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH
TECHNOLOGY****CONTRIBUTION OF AIR CARGO TRANSPORT AND AIR CARGO SERVICES TO
GDP IN VIETNAM****Mr. Nguyen Hai Quang***

*PhD. in economics, Training Department, Vietnam Aviation Academy, Vietnam

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ABSTRACT

This study aims to determine the contribution of air cargo transport and air cargo services to Gross Domestic Product (GDP) in Vietnam. These are the two major areas that make up the value of logistics in the air transport sector. Through the development of methodology and data collection for the six years from 2011 to 2016, the analysis results show that the contribution of air cargo transport and air cargo services to GDP in Vietnam has increased on average is 10.78% per year, nearly double the GDP growth rate of Vietnam. Although their share in GDP is still small but it is increasing and becoming important. In which, the share of air cargo services is growing faster than the proportion of air cargo transport.

KEYWORDS: Contribution, air cargo transport, air cargo services**I. INTRODUCTION**

Air cargo transport and air cargo services are two major factors that create the value of logistics in the air transport sector. It not only contributes directly to national income, but also contributes indirectly through the promotion of other sectors of the economy, especially the international trade of nations. To see the direct contribution, it is necessary to measure their value in GDP. To accomplish this objective, this study will brief the theoretical basis, build measurement methods, collect and analyze data from 2011 to 2016. The results of the study will help the Vietnamese aviation industry to see the value of its contribution, the development trend and the development of appropriate policies.

II. MATERIALS AND METHODS**Theoretical basis**

The air cargo industry incorporates an industrial supply chain, which includes airlines, customs, ground services, air cargo forwarders, brokers, domestic transportation, air cargo terminals, distribution centers and integrated international express services. Air cargo transport is an essential mode of transport for many industry sectors, ranging from high end manufacturing, engineering, pharmaceuticals, retailing and the automotive sectors. According to Air Transport Action Group, the largest economic benefit of increased air cargo connectivity lies in its impact on long-term performance of the wider economy through enhancement of the overall level of productivity.

On the global scale, the study of Global Shipper Forum (2015) shows that although air cargo transportation may be a small proportion of all modes of transport (2-3% transportation volume). However, it can represent a significant amount of countries' total imports and exports by value, typically from 35 to 40% in many advanced economies. In 2004, the air cargo industry is responsible for transporting approximately 29.9 percent of all international trade (John D. Kasarda et al., 2006) and after 10 years, in 2014 there is 35% of world trade by value were transported by air (ICAO, 2015).

In Europe, while air transport accounted for less than 1% of the tonnage of EU trade, but air transport accounted for more than 22% of the value of EU trade with the rest of the world (Oxford Economics, 2014). In India, for the period from 2008 to 2009, air cargo transport accounted for only 1.5% of volume but it accounted for 29% of value of cargo transported by all modes of transport (Ministry of Civil Aviation, Government of India, 2012).

Above all, although air cargo transport business is low in volume but high in value. The above researches showed that the air cargo industry has made an important contribution to the GDP and to employment in many countries around the world.

Research methods

GDP is an indicator reflecting the monetary value of all end-product produced in a given country over a certain period of time, usually one year (Duong Tan Hiep, 2001). There are three basic methods of determining GDP: 1) The expenditure method; 2) Method of production or value added; 3) Cost method or method of distribution. In which, the method of production or value added is considered easier to apply if one wants to calculate the contribution of an enterprise or an industry to GDP (Nguyen Thi Thuy Hong, 2014). By this method, the contribution of an industry or field to GDP is calculated by adding up the value added (VA) of firms in the industry or field (Formula 1).

$$GO = \sum_{j=1}^n VA_j \quad (1)$$

Where:

- GO: Value of contribution of an industry or field to GDP
- VA_j: The added value of firm j in the industry or field
- n: Number of firm in the industry or field

Value added reflects the new value of the business created. By subtraction method, it is measured by the market value of the output of the business minus the input value transferred into the product value in the production process. By cumulation method, it is measured by the sum of labor costs, production taxes, fixed asset depreciation and surplus (Duong Tan Hiep, 2001). Because of the surplus value is the net profit from the business and loan interest so the value added is calculated by Formula 2 as below.

$$\text{Value added} = \text{Labor cost} + \text{Depreciation} + \text{Loan interest} + \text{Net profit} + \text{Taxes on production.} \quad (2)$$

Taxes on production of the business unit include corporate income tax and other taxes such as royalties. Currently in the field of air cargo transport and air cargo services are not subject to royalties. Besides, total net profit and profit tax are profit before income tax. Therefore, value added in air cargo transport and air cargo services is calculated by the formula 3 as below.

$$\text{Value added} = \text{Labor cost} + \text{Depreciation} + \text{Loan interest} + \text{profit before income tax.} \quad (3)$$

Currently, Vietnamese airlines do not account separately for air cargo transport, so the value added for this activity is calculated as the percentage of revenue to total revenue (formula 4)

$$VA_c = VA \times \frac{R_c}{R} \quad (4)$$

Where:

- VA_c: Value added of air cargo transport
- VA: Total value added of the airline
- R_c: Revenue of air cargo transport
- R: Total revenue of the airline

The value added of air cargo transport and air cargo services will be adjusted to the 2010 fixed price through the annual price index of freight and warehousing announced by the General Statistics Office of Vietnam to estimate contribution to GDP in the same price at 2010.

Overview of businesses in the air cargo industry in Vietnam

The businesses in the air cargo industry in Vietnam includes Vietnamese airlines and the businesses related to air cargo transportation such as air cargo services and air freight forwarding services. Vietnam currently has three airlines engaged in air cargo transport including Vietnam Airlines, Jetsar-Pacific Airline and VietJet Air. Vietnam air services company (VASCO) is a subsidiary of Vietnam Airlines, using Vietnam Airlines air

transportation business license, so VASCO's cargo transported is counted in Vietnam Airlines. Vietnam's airlines are now primarily focused on passenger transport. Cargo transport is only to take advantage of excess load on passenger flights and these airlines do not have any aircraft for cargo transport only.

Air cargo services include warehousing and cargo handling services at air cargo terminal. In these services, the goods are processed, packed, preserved, stored and do the procedures before and after the flight. Air cargo services in Vietnam are carried out at 21 airports operating civil aviation with two major international airports namely Tan Son Nhat international airport and Noi Bai international airport. At these two major airports there are cargo service companies to provide air cargo services for flights. To be more specific, at Noi Bai International Airport, there are three companies namely Noibai Cargo Terminal Services Joint Stock Company (NCTS), Air Cargo Service of Vietnam Joint Stock Company (ACSV) and Aviation Logistics Corporation (ALS). These companies provide cargo services for international and domestic flights at Noi Bai International Airport. At Tan Son Nhat International Airport, there are also 3 companies namely Tan Son Nhat Cargo Service Co., Ltd. (TCS), Saigon Cargo Service Corporation (SCSC) and Tan Son Nhat express cargo Service Co., Ltd. (TECS). The cargo service companies at Tan Son Nhat International Airport only serve cargoes for international flights. Cargo services at the remaining 19 airports and domestic flights at Tan Son Nhat International Airport are currently being performed by Vietnamese airlines themselves. Air freight forwarding activities are served by more than 400 organizations involved in air freight forwarding and air freight agents in Vietnam.

Source data

The data about total revenue, revenue of air cargo transport, labor cost, depreciation, loan interest, profit before income tax and tons of cargo transported of Vietnam Airlines as well as VietJet Air are collected from their annual reports and financial statements. The tons of cargo of Vietnamese airlines was collected from the Civil Aviation Administration of Vietnam (Table 1). Total revenue, labor cost, depreciation, loan interest, profit before income tax and volume of goods tons of cargo served of NCTS are collected from its annual reports and financial statements. The tons of cargo served by cargo carriers was collected from international airports at Tan Son Nhat International Airport and all flights at Noi Bai International Airport in the performance report of Airport Corporation of Vietnam (ACV) and the Civil Aviation Authority of Vietnam (CAAV) (Table 2). These data are used to calculate the added value of all Vietnamese airlines and all air cargo services companies in Vietnam.

Table 1. Data for the calculation of added value of Vietnamese airlines

Year	Vietnam Airlines and VietJet Air							Cargo transported by all Vietnamese airlines (tons)
	Total revenue (VND billion)	Revenue of air cargo transport (VND billion)	Labor cost (VND billion)	Depreciation (VND billion)	Loan interest (VND billion)	Profit before income tax (VND billion)	Cargo transported (tons)	
2011	44,528	4,001	3,843	2,171	943	37	190,885	201,044
2012	49,142	4,459	3,971	2,800	1,224	231	192,575	201,578
2013	56,250	4,567	4,172	3,426	1,103	499	212,799	221,816
2014	60,459	4,854	4,444	3,449	1,088	1,317	230,668	240,668
2015	67,666	5,178	5,950	4,428	1,178	2,732	252,789	263,789
2016	72,330	5,426	7,221	5,495	1,468	5,781	319,332	331,332
Total	350,374	28,485	29,601	21,770	7,005	10,597	1,399,048	1,460,227
Average growth	10.19%	6.28%	13.45%	20.41%	9.24%	175.23%	10.84%	10.51%

Source: From Vietnamese airlines

Table 2. Data for the calculation of added value of air cargo services companies

Year	NCTS						Cargo served by all air cargo services companies (tons)
	Total revenue (VND billion)	Labor cost (VND billion)	Depreciation (VND billion)	Loan interest (VND billion)	Profit before income tax (VND billion)	Cargo served (tons)	
2011	347	74	10	0	176	207,833	432,397
2012	426	89	12	0	199	239,124	485,717
2013	575	96	11	0	310	304,327	604,543
2014	678	108	15	0	342	340,308	685,923
2015	799	122	23	0	401	394,185	777,921
2016	689	117	26	0	389	349,231	936,446
Total	3,513	607	96	0	1,816	1,835,008	3,922,946
Average growth	14.70%	9.46%	21.89%		17.15%	10.94%	16.71%

Source: From NCTS, ACV, CAAV

III. RESULTS AND DISCUSSION

Value of air cargo transport and air cargo services in GDP

The added value of Vietnam Airlines, VietJet Air and NCTS is determined by the data in Tables 1 and 2 and formula 3. From this result, the value added in air cargo transport of Vietnamese airlines and value added in air cargo services of air cargo services companies at nominal prices is determined by and formula 4. Then they are adjusted for fixed prices in 2010 by the freight and warehousing index. The measurement results for the six years from 2011 to 2016 at fixed prices in 2010 show that the added value of air cargo transport is over VND4,600 billion, an average increase of 16.09% per year; the value added of air cargo services is nearly VND 4,300 billion, an average increase of 18.78% per year and the total value added of these two services is more than VND 8,900 billion, an average increase of 17.33% per year (Table 3).

 Table 3. Added value of air cargo transport and air cargo services
 Unit: VND billion

Year	Nominal value added				Freight price and warehousing index *	Value added at fixed prices in 2010			
	Vietnamese airlines	Air cargo services companies	Total			Vietnamese airlines	Air cargo services companies	Total	
			Value	Growth/year				Value	Growth/year
2011	662	541	1,203		13.13%	585	479	1,064	
2012	781	609	1,390	15.52%	7.82%	641	499	1,140	7.14%
2013	779	829	1,608	15.66%	3.45%	617	657	1,274	11.80%
2014	863	938	1,800	12.00%	4.06%	657	714	1,371	7.63%
2015	1,141	1,076	2,217	23.13%	0.00%	869	819	1,688	23.13%
2016	1,554	1,426	2,980	34.41%	-4.04%	1,233	1,131	2,365	40.07%
Total	5,780	5,418	11,198			4,602	4,299	8,901	
Average growth	18.62%	21.36%	19.88%			16.09%	18.78%	17.33%	

Source: * General Statistics Office of Vietnam

The proportion of contribution of air cargo transport and air cargo services in GDP

The measurement results also show that the proportions of contribution of both air cargo transport and air cargo services in GDP from 2011 to 2016 are increasing at both current prices as well as fixed prices in 2010. This result is due to the air cargo volume increasing dramatically over time and higher than the GDP growth rate (5.91%). In addition, the freight and warehousing price index has tended to fall sharply. However, because of increasingly losing international market share of Vietnam's airlines, the average growth rate of cargo transported of Vietnamese airlines (10.51%) is lower than the volume of cargo served of air cargo services companies

(16.17%) in period of 2011-2016. This makes the proportion of contribution of air cargo services increase by an average of 12.15%, faster than air cargo transport (an average of 9.61%). The proportion of contribution of these two sectors at fixed prices in 2010 increases from 0.0464% in 2011 to 0.0774% in 2016 with an average annual growth rate of 10.78%. These show that although the contribution of air cargo transport and air cargo services to GDP in Vietnam is small but it is increasing and becomes more important (Table 4).

Table 4. Proportion of contribution in GDP of air cargo transport and air cargo services

Year	GDP (VND billion) *		Proportion of contribution in GDP(%)					
			Air cargo transport		Air cargo services		Total	
	Current price	Fixed price of 2010	Current price	Fixed price of 2010	Current price	Fixed price of 2010	Current price	Fixed price of 2010
2011	2,536,631	2,292,467	0.0261	0.0255	0.0213	0.0209	0.0474	0.0464
2012	2,950,684	2,412,821	0.0265	0.0266	0.0206	0.0207	0.0471	0.0472
2013	3,584,262	2,543,596	0.0217	0.0243	0.0231	0.0258	0.0449	0.0501
2014	3,937,856	2,695,796	0.0219	0.0244	0.0238	0.0265	0.0457	0.0509
2015	4,192,862	2,875,856	0.0272	0.0302	0.0257	0.0285	0.0529	0.0587
2016	4,540,301	3,054,470	0.0342	0.0404	0.0314	0.0370	0.0656	0.0774
Total	3,623,766	2,645,834	0.0263	0.0285	0.0243	0.0266	0.0506	0.0551
Average growth	12.35%	5.91%	5.58%	9.61%	8.03%	12.15%	6.71%	10.78%

Source: * General Statistics Office of Vietnam

IV. CONCLUSION

Air cargo transport and air cargo services are the two major fields that make up the value of logistics in the air transport sector. The measurement results of the value of air cargo transport and air cargo services in GDP in Vietnam for 6 years from 2011 to 2016 by fixed prices in 2010 show that the average growth rate is 10.78% per year, nearly double the GDP growth rate of Vietnam. The proportion of contribution of air cargo transport and air cargo services in GDP in Vietnam is still small but it is increasing and becomes more important (from 0.0464% in 2011 to 0.0774% in 2016). This increase is due to the contribution of both air cargo transport and air cargo services coming from the growth of the air cargo market and the declining trend of freight and warehousing price. However, the proportion of contribution of air cargo transportation is growing more slowly than that of air cargo services because Vietnamese airlines have increasingly lost their international market share. These research results help Vietnam's aviation industry to identify the contribution of air cargo and air cargo services to GDP, but on the other hand it shows that it needs to improve its transport capacity and competing capability to improve international market share of cargo transport.

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