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The Change in Reign:

As Hong Kong International Becomes the World's Top Air Cargo Airport, Challenges Lie Ahead

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The crown has been passed from Memphis to Hong Kong. Memphis, which had been the leading cargo airport every year since 1992, handled 3.9 million metric tons of cargo in 2010. Hong Kong processed 4.1 million metric tons last year – an increase of 23 percent over the previous year.

Table 1: Top 10 Air Cargo Airports, 2010, 2009, 2008

2010 Airport	2010 Cargo (metric tons)	2009 Airport	2009 Cargo (metric tons)	2008 Airport	2008 Cargo (metric tons)
HONG KONG INTL	4,168,394	MEMPHIS INTL	3,697,054	MEMPHIS INTL	3,695,438
MEMPHIS INTL	3,916,937	HONG KONG INTL	3,385,313	HONG KONG INTL	3,660,901
PUDONG INTL	3,227,914	PUDONG INTL	2,543,394	PUDONG INTL	2,602,916
INCHEON INTL	2,684,500	INCHEON INTL	2,313,001	INCHEON INTL	2,423,717
TED STEVENS ANCHORAGE INTL	2,578,396	CHARLES DE GAULLE	2,054,515	TED STEVENS ANCHORAGE INTL	2,339,831
CHARLES DE GAULLE	2,399,067	TED STEVENS ANCHORAGE INTL	1,994,629	PARIS-CHARLES DE GAULLE	2,280,050
FRANKFURT/MAIN	2,275,106	LOUISVILLE INTL	1,949,528	FRANKFURT/MAIN	2,111,031
DUBAI INTL	2,270,498	DUBAI INTL	1,927,520	NARITA INTL	2,100,448
NEW TOKYO INTL (NARITA)	2,167,843	FRANKFURT/MAIN	1,887,686	LOUISVILLE INTL	1,974,276
LOUISVILLE INTL	2,166,226	NEW TOKYO INTL (NARITA)	1,851,972	SINGAPORE CHANGI	1,883,894

Source: Airports Council International (ACI)

The change in reign corresponded with a dramatic 15.2 percent growth in world air cargo following a disastrous 2009 for the industry. With the global economy recovering, international air freight fared even better in 2010, expanding by 20.5 percent.

Yet, unless the air cargo industry significantly restructures, its resurgence will be threatened by other transport modes which have already began to ship many products that were previously in the domain of air cargo.

Likewise, Hong Kong International Airport must continue to improve in its efficiency of cargo processing since regional competitors are aggressively going after its China market. And the stakes are high.

Memphis utilized its reign to develop a prominent aerotropolis (airport-integrated economic region) around its two decades of cargo preeminence. Now, Hong Kong which spawned its own aerotropolis stretching deep into southern coastal China is facing its own challenges to air cargo supremacy.

To an extent, all major cargo airports are in similar positions nowadays, with the possible exception of Dubai which has defied economic gravity to mushroom in cargo volumes in the face of its own and the world's recent economic crisis.

Even as air cargo rebounds worldwide from the global recession, short-term external shocks and year-to-year fluctuations in volume can make for a bumpy ride. In addition, the distribution of cargo among airports has been shifting, in part because of changes in regional economic strengths, the evolution of hub airline strategies and routes, and the ups and downs of airport policies and performance.

The change in the rank ordering of cargo airports, especially Hong Kong and Memphis, highlights some of the critical factors determining airport cargo volumes. Although both airports are exceptionally well-managed, in some ways, they could not be more different.

Hong Kong International Airport's cargo volumes have surged on its proximity to China's booming Pearl River Delta—"the factory of the world"; the renewed strength of the global economy, and Asia's trend towards substantially greater use of air cargo. As Asia's most connected international airport, Hong Kong also builds on the extensive route structure of its predominantly wide-body passenger and cargo aircraft.

Image 1: Hong Kong Air Cargo Facility (HACTL)

Memphis' situation differs. Interestingly, international shipment volume at Memphis increased by 50 percent in 2010 over the previous year. This percent growth was actually more than that at Hong Kong's, though from a much lower base since the mix of cargo at Memphis is heavily slanted towards domestic shipments.

U.S. economic recovery has been modest, but that does not fully explain the slower growth in domestic air cargo volumes at Memphis. A reorganized U.S. trucking industry, which is moving cargo at a fraction of the cost, now captures many products and shipments that

previously went by air. The U.S. domestic air cargo market may also be approaching maturation, at least temporarily.

Memphis International Airport never owed its prominence to the output of its region's manufacturing firms. Rather, Memphis' cargo pre-eminence resulted from FedEx's decades ago, pioneering hub and spoke strategy for parcels. FedEx chose Memphis because of its mid-continent location which is well-suited for an air express hub. The vast bulk of FedEx's cargo leaves Memphis almost as soon as it arrives from distant locations. Memphis is further blessed with an exceptionally rich highway and rail network as a node for surface-based cargo.

Memphis International Airport, however, has been approaching capacity limits at critical times. FedEx's hub-and-spoke strategy means that the airport is furiously busy for a few hours each night, creating tremendous air and ground peaking.

Image 2: Memphis FedEx Hub

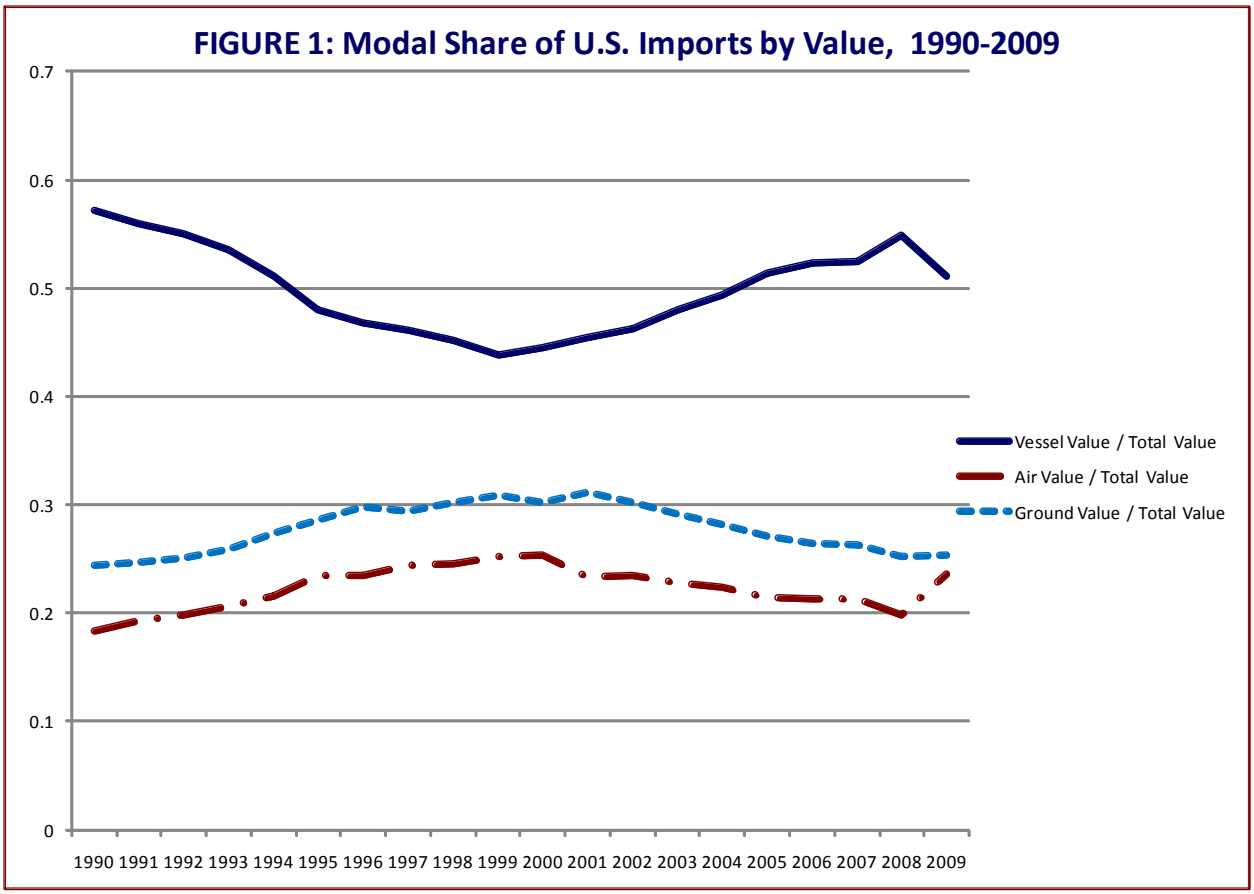
This peaking can also be caught between turbulent weather and a commitment to deliver on time. Accordingly, FedEx decided over two decades ago to geographically disperse its hub functions with Indianapolis serving as a complementary mid-continent hub and a number of regional hubs emerging as traffic allowed. Establishing regional hubs diverted considerable FedEx cargo from Memphis to alternate U.S. airports.

And now there's a strong and growing competitor for traditional international air cargo—ocean shipping—which is striving to siphon greater shares from airlines and airports.

Air cargo's challenges

According to former Chairman of the U.S. Federal Reserve Bank, Alan Greenspan, the weight of U.S. economic production remained roughly constant throughout the second half of the 20th century. However, the price-adjusted value of U.S. trade per pound rose by approximately four percent annually. That latter statistic helps explain the basic value proposition of air cargo: moving high value-to-weight products from places of production to places of consumption in a timely, cost-effective manner.

The growth of high value, low-weight production would seem to bode well for the demand for air cargo – and it has. Between 1950 and 2008, along with the introduction of large jet aircraft, air cargo grew from only 730 million ton-kilometers to 156,309 million ton-kilometers—approximately 200-fold increase—and all signs suggest continued growth in the long-term. Air cargo has not achieved its full potential, though. By some measures, the market share of cargo captured by air has been flat for over a decade.



Source: Kenan Institute analysis of U.S. Dept. of Commerce data

Figure 1 illustrates the market share of international air cargo over the past two decades using data on the value of U.S. imports, the largest air cargo market in the world. Through the end of the 1990s, air cargo was not only increasing in volume but also increasing in market share compared to other transport modes. Over the last decade, air cargo lost market share to ocean shipping, despite generally increased volumes of air cargo through 2008.

Conversely, after losing market share for much of the 1990s, ocean shipping increased its share in the first decade of this century. That increase is not due to a changing mix of traded products. The general pattern holds for many of air cargo's staples.

A new generation of larger ships reduced ocean shipping costs, but three other factors also played a role. The first was a continuing spread of containerization which allowed a broader range of products to be successfully shipped by sea. The recent wave of expanded containerization has also made inroads in perishables – a market segment formerly thought to be securely dependent on air cargo. The second was an increase in port efficiency brought on, in part, by port congestion in the 1990s. Goods which might have once waited for days, if not weeks, before moving inland, now might be processed in a matter of hours. The third was a re-optimization of supply chains which decreased overall production, inventory, and shipment costs.

While international air express processes substantially improved, corresponding improvements were much slower with traditional air cargo. IATA notes that today the average international air shipment still takes six days to travel from the shipper's door to that of the consignee – despite the fact that the longest and most central portion of the journey can be made in less than 24 hours. That six days figure has remained nearly constant for the past two decades causing traditional air cargo to lose market share to the air express industry and ocean shipping.

As much as 90 percent of the door-to-door time taken by traditional air freight shipments is spent sitting still. With today's technologies and air route structures, a large majority of international air cargo could be delivered within 72 hours or less. Cutting the average delivery time in half would give a powerful boost to air cargo in general and to the airports which serve as primary shipping nodes.

Air shipping is fundamentally not that different from ocean shipping. The introduction of wide-body aircraft over the past 40 years has contributed to the growth in scale and competitiveness of air cargo. A new generation of large, fuel-efficient aircraft, soon to be introduced, promises another significant boost.

But, traditional air cargo still requires far too many "touches," especially at airports. Indeed, the most perilous portion of a shipment's journey may be between the cargo terminal and the aircraft, and much of the dwell time could be eliminated, contributing to a new wave of air-assisted supply chain management.

The recent strong rebound in air cargo volumes and market share may have been as unexpected as it was welcome. Air cargo's 2009-2010 rebound may reflect, in part, the significant reductions in ocean capacity during the global recession which is more difficult to ramp back up than aircraft with economic recovery.

Consensus opinion, though, seems to be that shippers and consignees have become more risk-averse in the present turbulent economic environment. They are reluctant to hold inventory and therefore willing to pay for air freight for time-definite delivery (on-time, just-in-time, every time).

That raises the question of whether all participants in the air cargo value chain – airports, airlines, freight forwarders, customs brokers, and others – will do what it takes to make air cargo as fast, reliable and predictable as possible in the long term, thereby maintaining competitive advantage.

Can Hong Kong hold on?

This brings us back to Hong Kong. It is well-situated but not optimally so. There are other airports such as Shanghai Pudong and South Korea's Incheon International Airport that are likewise strategically located with respect to the workshops and factories which can fill aircraft currently departing Hong Kong.

Hong Kong's top spot in the cargo airport hierarchy may rest in its economies of scale, or in its extensive international route network and frequencies of flights, or in its jumbo passenger aircraft which cross-subsidize cargo service, or in the speed at which it can process cargo on the ground. Or it may simply be its first-mover advantage in the greater China region.

At present, most airlines, freight forwarders, and shippers find it more advantageous to route through HKIA than they do through nearby Guangzhou Baiyun or Shenzhen airports. These Delta-located airports, however, are beginning to seriously challenge Hong Kong for Pearl River Delta freight as their airlines and cargo facilities expand.

To the extent that Guangzhou and Shenzhen continue to develop new air routes, Hong Kong's reign may be predicated more on airport performance and efficiency of cargo handling than the volume of cargo generated nearby.

Shanghai Pudong, Incheon, Guangzhou Baiyun and Shenzhen when combined present a major challenge to Hong Kong retaining its number one air cargo airport ranking in the future. Other shipment modes, especially ocean and trucking, present an analogous competitive challenge to the entire air cargo industry. Will Hong Kong International Airport and the air

cargo industry, in general, be able to restructure with continuous improvements in speed, reliability and predictability or will they cede to others?

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