Abstract

This issue paper attempts to determine the viability of using financial derivatives to actively sell and resell available cargo capacities in the open market. This paper illustrates how the changing air cargo business environment, as a growth industry, can benefit from such a financial tool to hedge risks associated with the market developments. In essence, financial derivatives in the form of forward contracts can be constructed that details an agreement to buy or sell an underlying asset – cargo capacity – at a certain future time for a certain price. As such it can be contrasted to a spot contract, which is an agreement to buy or sell an asset today. Compared for example to a blocked space agreement with capacity guarantees, the forward contract can be traded in the over-the-counter (OTC) market.

The introduction of such forward contract can potentially reduce the uncertainty surrounding the timing and amount of cash-flow. Cargo capacity can be sold today for a future date with the exact time of delivery and exchange of money specified. Such certainty provides the airline with the ability to better project its capital expenditures requirements as well as make budgeting more stable.

On the other hand it provides the agents and forwarders with a tool to buy cargo capacity at a fixed time for a specified price but also the option to trade the cargo capacity in case it has not enough demand.

Air Cargo Industry

The world air cargo market is expected to more than triple over the next 20 years according to biennial reports prepared by Boeing. It is believed that this growth will be generated, in part, by several factors, including: -

- global economic growth;
- continued breakdown of international trade barriers;
- expanded use of just-in-time inventory practices;
- growth in export driven economies, particularly those of the countries in the Pacific Rim;
- growth of e-commerce; and
- increased movement of manufacturing to economies with low labor costs.

Moreover, there is a growing trend in the passenger airline business toward replacing existing wide-body passenger aircraft and combination passenger/cargo aircraft with smaller, more efficient twin-engine, passenger aircraft which have limited cargo space. The expected growth in demand for air cargo services, combined with the lower rate of growth in passenger airline cargo capacity and the continuing pressure on the airline industry to reduce operating costs, will provide air cargo companies with opportunities as well as challenges to successfully grow their business.

The Issues

In today's environment, air cargo is still considered a bit of a step-child to the passenger side of air transportation. As such, it can be considered by and large a simple by-product. Consequently, many operators keep their cargo activities in niches, both externally and measured against internal attention. Henceforth, cargo activities continue to be driven by passenger needs and schedules. Yet, the air cargo segment has seen growth rates far exceeding those in global passenger traffic for the last 10 years or so. As a matter of fact, research shows that the gap in growth rate is increasing rather than decreasing.

Because of the anticipated impressive growth rates is a very competitive area. The current conditions seem to suggest that the ability of airlines to prosper from this growth was hampered by uneven transport flows, fluctuating demand and supply resulting in massive excess capacity. As a consequence, this oversupply depressed the price level, accelerating a decline in prices and yields.

Realizing the state of the industry and wanting to cash-in on the growth, the industry as such has already seen some structural changes taking place. For example, some airlines, i.e. Lufthansa Cargo AG are trying to establish a truly global network, sometimes together with partners. They are well positioned to define and establish product and quality standards and together they can invest in IT infrastructure. KLM and Alitalia are a good case in point. Not long ago, they announced a de facto merger of their cargo operations. If the relationship had not broken up, Northwest Airlines[1] would have been likely to join as well. This would have resulted in a global mammoth. Not surprisingly, airlines at the forefront of this change are setting the pace for others to follow. However, an airline not in the position to serve a lucrative market has only two options: joining a winning group, or accepting dramatically decreasing yields.

Obviously, the air cargo market is redefining itself and the way it does business. The shift has focused, especially since deregulation has required airlines to become more customer focused. While some of the most important elements for competition in the air cargo business are the range, payload and cubic capacities of the aircraft, the price in conjunction with flexibility, quality and reliability of the cargo transportation service will have increasing effect as the industry moves forward.

Moving ahead air cargo operators attempt to invent and redefine products to differentiate themselves from the competition. Regardless, dedicated airlines can easily copy innovative service approaches shortly after their introduction. Adding that new market entrants make the situation even worse. The resulting problems can be disastrous, over-capacity can deflate prices significantly, also uneven transport flows and peak periods make capacity scheduling a daunting task. Agents face similar problems, a sudden surge in demand can prohibit them from accessing valuable cargo space. Consequently, the industry is characterized by quickly changing prices as well as seriously fluctuating demand and supply. This development suggests that air freight capacity is becoming a commodity.

In order to ensure financially viable business in light of the competitive markets, companies should have tools available that allows them to manage the risk surrounding the uncertainty more effectively. Pricing becomes an integral issue in the strategy and should become an integral tool to manage uncertainty.

Pricing

Today, cargo pricing appears less transparent and more complex than it ought to be. The problem arises from the fact that cargo pricing for most carriers is still a local task. In other words in the cargo world, there is no such thing as a joint reservation system. It seems prices rely more on individual terms arranged between the airline and shipper/forwarder/consignee and regional offices exhibit much greater freedom in defining regional prices. In essence, this freedom has lead to greatly fluctuating prices depending on the capacity utilization rate and general market conditions.

Such pricing, often done in light of incomplete data about the market introduces a great degree of uncertainty for the airlines as well as forwarders. In particularly the use of spot quotes appears to decreases the planning horizon and makes scheduling extremely uncertain.

A tool to help centralize pricing plus to making it more dynamic, that is market oriented, could improve planning and certainty surrounding investments in cargo capacity. In the capital markets, financial derivatives have long been used to neutralize risk by fixing the price for an underlying asset.

Financial Derivatives

A derivative is a financial instrument whose value depend on the values of other, more basic underlying variables. In recent years, derivatives have become increasingly important in the world of finance. Futures and options are now traded actively on many exchanges. Furthermore, forward contracts and many other different derivatives are regularly traded outside exchanges by financial institutions, fund managers, and corporations in what is termed the *over-the-counter* market.

[1] One of the only US-Carriers to operate a dedicated all-cargo-aircraft only fleet

While the variables underlying derivatives are most often the prices of traded assets, derivatives are increasingly dependent on almost any variable, from the price of hogs to the amount of snow falling at a certain ski resort. Henceforth, cargo capacity can be used as a variable underlying a derivative.

Key Concepts

Vanilla (plain) forwards and forward rate agreements are over-the-counter derivative instruments that lock in a guaranteed price for an underlying asset, such as cargo capacity for a specific O&D, for a pre-specified amount at a pre-specified time in the future. They are typically executed with zero upfront cost and for this reason are preferred by some counterparties, particularly corporate hedgers, to options.

However, zero upfront cost does not mean zero cost. Because they **guarantee** a price or rate, forward transactions remove not only the risk that the underlying will move against the holder over the life of the forward, they also remove any potential to benefit from advantageous moves in the underlying. **They therefore trade certainty for potential opportunity costs**. Options, in contrast, incur an upfront premium but also allow the holder both to hedge and to benefit from any upside. The flexibility of options has led to the development of hybrid combinations of forwards and options to create structured forwards. These can be tailored to meet a wide variety of client.

An Example

A treasurer who knows that a certain amount of capacity will be available at a certain time in the future can hedge the air cargo rate risk by selling (*taking a short position*) in a forward contract. The treasurer thus knows already today the price he will receive for a specified amount of available capacity. The agent on the other hand expects a certain amount of needed cargo capacity will have to be purchased at a certain future time. He can hedge by taking a long position (buying) in a forward contract. He is assured of a fixed price at a fixed time. In such a basic term the airline is certain about its future cash inflows and capacity requirements. The forwarder is certain about a specified amount of capacity at a determined price.

Unfortunately, the agent/forwarder/shipper cannot be 100% certain about the needed supply as he is dependent on his customers to make bookings accordingly. In case the agent/forwarder/shipper is not able to use the contracted capacity, he is free to sell the contract in the over-the-counter market to potential agent/forwarder/shippers who have not hedged the risk and were faced with uncertainty surrounding sufficient capacity.

Constructing such deals the individual carriers can determine themselves what the ratio of capacity is they want to hedge. This determines the amount of capacity that must be sold in light of the uncertainties.

The fact that these contracts can be sold over-the-counter prod in secondary markets not only increases demand in these deals but it can also provide the treasurer with a tool to price remaining open cargo capacity according to market conditions. It provides the airlines with a forward looking tool that incorporates most of the available information.

In this example all parties effectively avoided an exposure to adverse movements in the price of cargo capacity. While the example is very simplistic, as is a forward contract, more complex synthetic derivatives can be used to tailor the risk profile of such an agreement.

The appendix shows various examples of the most important classes of forward and structured forward – but any of these basic templates can be altered with additional strike levels, barriers and reset features.