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Business aircraft acquisitions and sales

Bachelor Thesis

Martin Meloun

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Ing. Bc. Jakub Hospodka, Ph.D.

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doc. Ing. Daniel Hanus, CSc.
vedoucí
Ústavu letecké dopravy



prof. Dr. Ing. Miroslav Svítek
děkan fakulty

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Martin Meloun
jméno a podpis studenta

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Declaration

I hereby declare that I wrote this thesis myself using the referenced sources only. I also agree with the lending and publishing of this thesis.



Prague, August 1, 2015

Martin Meloun

Abstrakt

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Tato bakalářská práce se zabývá zejména vývojem cen a pohybem cenových trendů u letadel patřících do kategorie business jet a jejich vlivem na kupní rozhodování.

Je obecně známým faktem, že letadla se svým postupujícím stářím ztrácí svou původní hodnotu. Cílem práce je zjistit, zda-li vlivem tržních a jiných vlivů může dojít zároveň k nárůstu ceny stárnoucího stroje a tím k ovlivnění rozhodovacího procesu spojeného s nákupem nebo prodejem letounu. V kladném případě se pokusit o identifikaci důvodů, jejich specifikaci a určení míry jejich vlivu na cenový trend. Práce zároveň odlišuje charakteristiky jednotlivých tříd letadel v oblasti business jets a specifika světových trhů.

Výsledek práce vede k optimalizaci kupních rozhodnutí s ohledem na aktuální situaci převládající na celosvětovém trhu business aviation a možnosti predikce cenových trendů.

Klíčová slova

Business aviation, cenové trendy, rozhodovací procesy, světové trhy, business jet

Abstract

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This bachelor thesis deals with the development of prices and change in price trends of aircraft belonging to the business jet category. It then examines their impact on the decision making process during aircraft acquisitions and sales.

It is well-known fact that airplanes are losing value due to aging. The goal of this thesis is to determine, whether the aging machine can register a rise in its price due to market or other influencing factors, hence affecting the decision making process. In the case of a positive result then identifying the factors and defining their degree of influence on the price trend. The thesis also takes into consideration specifics between different aircraft classes in the category and dissimilarity of the world markets.

The result of the thesis leads to the optimization of acquisition decisions with respect to the situation of the world business aviation market and the possibility of price trend prediction.

Key words

Business aviation, price trends, decision making processes, world markets, business jet

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1. List of Abbreviations

ACJ	Airbus Corporate Jet
BA	business aviation
BBJ	Boeing Business Jet
BB ratio	book to bill ratio
Bizjet	business jet
Bizliner	business airliner
CDO	collateralized debt obligation
CEO	chief executive officer
CIS	Commonwealth of Independent States
CJ	Citation Jet
DJI	Dow Jones Industrial Average
EU	European Union
GDP	Gross Domestic Product
IT	Information technology
NATO	North Atlantic Treaty Organization
OEM	original equipment manufacturer
OPEC	Organization of Petroleum Exporting Countries
PR	public relations
UHNWI	ultra high net worth individual
ULR	ultra long range
UK	United Kingdom
US	United States
USD	United States dollar
VLJ	very light jet
S&P	Standard & Poor's

2. Preface

Business aviation is one of the most *progressive* and *money demanding* industries in the world. To understand processes which influence the behaviour of buyers, sellers, operators and/or users of business aircraft it is not generally sufficient to use general knowledge of economy, business and psychology applied to everyday human life. The common law of supply and demand is more widely affected by psychological factors like ego, greed, prestige or image and these in different ways according to the world region.

To be able to understand this market and predict the behavior of its participants, it is essential to perceive factors affecting decision making processes made by “ultra-high net worth” individuals and comprehend their needs. Because independently of the fact whether the purchase or sale consists of privately owned aircraft or aircraft owned by a corporation, there are always very influential people who can make the final decision. People who are in charge of major processes in the corporation, they are chief executive officers, owners and leaders, people whose wealth consists of millions or billions of dollars. These are called ultra-high net worth individuals; they decide whether to sell or not to sell and that is the question.

Let us suppose have a company (or individual) owning a business jet; due to various reasons it decides to replace it with a new one. Now it has two possibilities, the first of them is to sell the old one on the market under current conditions or to keep and charter it while awaiting an improved market situation and therefore a higher price. This example provides us with a very complex background for further exploration of the industry. Is it possible to predict future market movements with a reasonable success rate and if not, are there any factors the knowledge of which could help us make a more accurate decision? How exactly is the business aviation market connected to the general business market/s and can we use economical indexes like DJI, S&P, and Russell in our predictions? How are world’s busav markets interconnected and what is the effect of targeting? Finally, is it possible to expect a higher market value due to market movements even if the aircraft is always losing value by aging? These questions play a vital role in the whole process, therefore it is helpful, if not crucial, to answer them correctly.

3. History of business aviation

After the first flight of a heavier-than-air powered aircraft in 1903, aviation records made significant progress. If defense, funded by the state and being the most capital intensive industry in the world, finds mastery of air as an essential part of war, it is only a matter of time before aircraft will be used as war machines. Despite all the negatives, this fact enormously affected the conquering of airspace

during and after the First World War. Wartime industry developed first fighters, single engine, relatively fast and maneuverable aircraft; as well as bombers, multiengine aircraft with a higher load capacity. A surplus of these airplanes, after 1918, led to their usage as civil transport vehicles, for personal travel and company promotion via barnstorming. Great improvements are visible especially in reliability and safety which makes the possibility of air transport acceptable in the eyes of society these days. Even greater progress is seen after the Second World War, which interrupted civil and corporate usage of aircraft, but significantly accelerated the development of aircraft themselves.

An excess of military aircraft after the war, which could be purchased and rebuilt for almost insignificant amounts, accompanied by thousands of very experienced and jobless airmen, resulted in a boom in commercial aviation. The center of commercial in those days (and even today) aviation was the United States. Not only because of the economic power they had, but mostly because their infrastructure was almost unaffected by war. Certainly, an excess of airplanes after the war was not the only factor influencing progress in aviation. Despite the horrors, the War brought enormous technological advance as well. We can mention a wider and more accurate usage of radio waves in air navigation, improvement in aerodynamics and airframes, high performance piston engines and finally – jets.

A combination of all the above-mentioned factors and accelerating competition led to the growth of the airline business. As these were the main “users” of airspace, new regulations were directly suited to their needs. However, as commercial jet aircraft became a fast, convenient and a comfortable way of transportation even for business travelers, the birth of business aviation as we know it today, was only a matter of time. Soon it became obvious that it would be necessary to unite business aviation operators and represent their needs in the field of air laws and regulation. Therefore in 1947 the representatives of 19 major US companies met in New York to set up a non-profit organization for that purpose. As a result, the former National business aircraft association was established. Fifty years later in the year 1997 it was renamed to its present name, the National business aviation association (NBAA).

Since that time business aviation has had an irreplaceable role in the field of commercial air transport. It did not take long and jet aircraft designed solely for executive and business transportation were introduced. The first of them was Lockheed Jetstar, used among others by Elvis Presley. Very soon after that, another significant milestone was reached with the introduction of the De Havilland Hawker 125. While these were products of companies which were mainly focused on airline transport, in the late sixties new companies oriented purely on business aviation introduced their first models. These were the Gulfstream II and Learjet 25.

During the seventies, business aviation recorded a further increase of available aircraft types and the connected growth of their usage. Since for many it was too expensive to own a jet, a niche was created on the market. This was filled by new companies oriented on aircraft charter and air taxi services. Forming a significant part of the global air transport industry, business aviation was not naturally part of global distribution systems (GDS) as traditional airlines were. The more significant was then onset of the internet during the nineties and at the end of the millennium. Business jets were always a strong part of a company image, which appeared even important to highly capitalized companies during the Dotcom bubble at the end of the decade. After a short downturn before 2003 the Housing bubble formed another very favorable environment for business aviation growth. Even though that growth went into steep decline in 2008 followed by a long period of stagnation, we can now see slow but clear signs of general rise.

In most technological areas business aviation can at least keep pace but very often it outstrips the airline industry. As there is, in comparison to the oligopolistic airline sphere, stronger competition between at least 5 or 6 major players, they all try to invent new avionics, engine and airframe solutions making business aviation one of the most advanced industries in the world.

4. Business jets and their manufacturers

The market of business aircraft market is slightly different from the commercial airlines market. There are more than 5000 airlines worldwide operating more than 30.000 aircraft and they still need more. The market of airliners is practically an oligopoly of only two manufacturers - Boeing and Airbus. These facts together mean that if an airline wants a plane now, in case of the most used midsize airliners, the B737 and A320, it will have to wait in a queue for about 15 years. With the average time of service of an aircraft being around 30 years we have a book-to-bill ratio for these planes far above one. Under these conditions there is no urgent need for a new aircraft type development and their promotion into service. Even the profile of a typical buyer is different; for airlines, airplanes are simply a business tool which has to have the desired reasonable comfort level, has to have fair financial efficiency with good safety parameters and last but not least, must be as cheap as possible. On the other hand, a business aviation aircraft have to have the top level of comfort, the highest level of safety and fair performance at practically any price. Business aviation aircraft buyers are typically their users as well, as well as their families and colleagues or employees. They do not use business aircraft only as a transport means, but also as part of their image, it boosts their ego, it is a symbol of their style. Hence the importance of new technology and type development is much higher. Taking into consideration the fact that the environment is quite competitive in this sphere, we have actually found a lot of reasons why business aviation

manufacturers are trying to introduce new types and improvements fairly often. There are about 32000 business aircraft around the world in total. (1) With six or eight major manufacturers in the field, the competition is much higher than in the case of the airline industry. Based on the knowledge of the above-mentioned difference between both segments' typical buyers and the number of competing manufacturers, we can understand why an average airplane "changeover rate" is only 7 years. Such a short rate is partly based on customers' wishes, but mainly artificially created by manufacturers themselves to increase liquidity.

To further immerse in the world of business aviation, it is necessary to have at least a basic knowledge of aircraft manufacturers and their types being presently used or developed. For clarity, we will take into consideration only the leading and most significant manufacturers of business jets sometimes called the "top five". There are Bombardier, Cessna, Dassault, Embraer and Gulfstream. To make it more complex we can also add Beechcraft. Although not being typical business jet manufacturers, we have to add business airliner manufacturing giants Boeing and Airbus.

4.1. Airbus

Let's start in alphabetical order - Airbus SAS. After the Second World War the American manufacturers were those who were clearly leading the market. Although in Europe there were several aircraft manufacturers, their capacities were not sufficient to compete with Boeing, McDonnell Douglas or Lockheed. As a response to that fact, in 1967 the three leading European countries in aviation (Germany, France and the UK) came to an agreement to set up a new company called Airbus Industries. The first aircraft built was an Airbus A300. Twenty years later, a very successful model was introduced, which made the company a very significant player in the field, this model was the A320. Similarly to Boeing, the company entered the market of corporate aircraft relatively late, in 1997. It started to convert its types A318-A321 to corporate versions Airbus Corporate Jet ACJ318s, ACJ319s, ACJ320s and ACJ321s.

The company headquarters is in Toulouse, France. (2)

4.2. Beechcraft

Beechcraft Aircraft Corporation was founded shortly before World War Two in 1932. Its first aircraft, known as Model 17, or better as Beechcraft Staggerwing, earned the company enormous success. During the War it developed aircraft for the US Air Force which helped it rapidly develop and enter the post-war market in a very strong position. It introduced the world's famous models such as the Beechcraft King Air or Baron, but to fully enter the business jet market it merged with the Raytheon Company forming Raytheon Aircraft. With that step, the era of famous Hawker Beechcraft business

jets including model Hawker 400, was started. However, the transformation of the company from Raytheon was not done until 2007. At this time, aided by the recession, the company got into serious financial trouble which resulted in its bankruptcy in 2012. Thanks to a Chinese investor, it was able to recover from bankruptcy on its own as rebranded Beechcraft Corporation. Until 2014 it was nevertheless providing customer support only to the 18,000 of its previously made business jets.

It was then purchased by Textron forming, together with Cessna, a new division called Textron Aviation. Beechcraft is expected to launch a brand new model in the near future.

Its headquarters is in Wichita, Kansas, US. (2)

4.3. Boeing

Now we are continuing with world airline leader Boeing. It was set up by William Boeing in Seattle 1916, thanks to which Boeing has one of the longest histories between aircraft manufacturing companies. It produces aircraft for several fields of usage, beginning with sporting and training aircraft to military fighters to airliners. The last sector is the one in which Boeing plays a major role. In 1997 it merged with McDonnell Douglas by which it clearly dominated the American airline market among others. During the same time, Boeing started to build business airliners. These are known as Boeing business jets, mostly based on the B737. Recently, even larger sized airplanes have become available in business versions, such as the B787, B777 or B747-8.

Boeing's headquarters is in Seattle, US. (2)

4.4. Bombardier

Bombardier is a Canadian company, which was founded by Joseph-Armand Bombardier shortly before the Second World War in 1937. Being the third largest aircraft manufacturing company in the world, Bombardier plays a major role in business aviation. Its aircraft were one of the first ones to serve business air transportation, or to be more exact, aircraft of the Learjet Company which was acquired by Bombardier later. In 1986 it also acquired Canadair Company turning it into a profitable company.

These days, Bombardier is producing a wide range of business aircraft, starting from "traditional" business jets like the Learjet 70, 75 or 80, ending with ultra-long range jets at the jets high end. These are known under the names of Bombardier Global 5000 and 6000. Currently it is developing the successors of these aircraft: Global 7000 and 8000. These are supposed to enter the market in 2016.

Bombardier's headquarters are in Quebec, Canada. (2)

4.5. Cessna

Then we have Cessna Aircraft Company owned by Textron Inc. (which includes Bell Helicopter and the Beechcraft Corporation as well) as the number one manufacturer in terms of the number of flying business aircraft. It was founded by Clyde Cessna in 1927 and since that time it has become a very well-known name especially with the small piston aircraft. These are simply time-tested and fly all over the world. However its line of business jets does not drop behind. The famous Citation Ten was at the time fascinating by its very high speed.

During the crisis in 2008 Cessna nevertheless registered a significant drop in orders. This was most probably because of its targeting of the smaller jet market and hence less wealthy companies, which were hit very hard by the economy downturn and all the more in the United States. These days, Cessna is slowly recovering from the recession and gaining its lost strength.

Cessna headquarters in Wichita, US. (2)

4.6. Dassault

Dassault represents (with the exception of Airbus) Europe in business aircraft manufacturing. The French company originally focused on military airplanes made its first business jet in 1963. However the original concept of business aircraft dating back to 1954 and known as The Méditerranée, unfortunately remained on the paper. Its later version was called Mystère 20, but after commercial complications with a French sounding name in English speaking markets, it was changed to Falcon 20. This step paved the way for the iconic Falcon series. Probably the most well-known of these today is the triple engine airplane Falcon 7X, making a part of a very large jet spectrum.

In these days, Dassault is developing new versions of Falcons, named Dassault 7X – the successor of the older Falcon 7 and a clean sheet model called Falcon 5X.

Dassault headquarters is in Paris, France. (2)

4.7. Embraer

The one and only Brazilian Business aircraft manufacturer is Embraer. The manufacturer of mostly regional jets built its first business jet in 2001. It was a rebuilt Embraer ERJ135 and named Legacy 600 in its business version. The company's history dates back to 1969 when Empresa Brasileira Aeronautica (Embraer) was founded in Brazil. It was a relatively successful manufacturer of turboprops and military aircraft. During reorganization at the turn of the millennium in order to prevent it from bankruptcy it was decided they would enter the field of business aviation. As the company was relatively unaffected by the 2008 economic downturn it was able to enter the market

with the Embraer Phenom 100 and 300, registering significant success. These days, it is developing aircraft with the aim of having at least one aircraft in each business jets class.

Embraer headquarters is in Sao José dos Campos, Brazil. (2)

4.8. Gulfstream

Another American manufacturer is Gulfstream Aerospace, which specializes as the one and only on business jets. The corporation is wholly owned by General Dynamics. But its history goes much further. Its parent company was the Grumman Aircraft Engineering, co. in the 50's specialized mostly on military aircraft. In those days it produced its first business aircraft, the propeller powered Gulfstream I. Later in the century it produced its first and famous jet the Gulfstream II. It did not change its name until it merged with the American Aviation Corporation in the 70's, since that time it has borne the name of Gulfstream American. It produced its first very large business jet in 1990's after being acquired by General Dynamics, it was named the Gulfstream V. This very successful business aircraft clearly directed the company in the field of high-end large jets.

Now it is developing the Gulfstream G500 and the G600 as successors to the latest G550 and G650.

The company headquarters is in Savannah, Georgia in the United States. (2)

Even though practically every aircraft manufacturer has worldwide influence and airplanes of all the above-mentioned OEMs are sold everywhere around the world, it would not be entirely correct to say that there is not any difference between the global markets where they are sold. There will always be the role of certain patriotism. Especially in the case of certain manufacturers, e.g. Embraer, we can detect that they profit mostly on local markets. It is certain that in some businesses it can be a benefit to fly in an aircraft which was built in the country of the owner's residence, especially in the meaning of pride, ability and devotion. Hence in case we have two comparable aircraft where one is of any known non-local brand and the other is of the local brand, the second one will have a significant advantage.

Another way of getting a local advantage is representation of the manufacturer in the area of sales. For example, Gulfstream had a relatively strong network of dealership bases which goes together with higher customer support in China before the 2008 crisis, easy distribution of spare parts and closer position of inspection and repair services workshops. This, hand in hand with other factors, allowed it to emerge to this relatively strong market after the crisis and return to its high profit levels.

4.9. Book to bill ratio

The important indicator in manufacturer wellbeing is book to bill ratio. Simply said it is the ratio of orders booked to orders delivered during a period of time. It indicates the trend of demand for a certain product. The ratio below one indicates low demand and above one indicates high demand for the product. A value equal to one indicates that precisely the same number of products was invoiced as were ordered, hence the company is using its capacity for 100% and is able to deliver all orders in time. If demand for a product is decreasing the number of delivered products is higher than that of those presently ordered and the company is starting to have some spare capacity. On the contrary, if demand is increasing, the number of products delivered is lower than that of those presently ordered and the company cannot satisfy customer demand without increasing its capacity or delivery time.

In oligopoly-type business like this e.g. the airline industry, there is understandably a will to keep the BB ratio fairly above one so to have assured business. Companies then do not have to invest huge sums in the infrastructure to decrease delivery time as well as they can afford to keep the prices of their products relatively high. As the airline manufacturing industry keeps BB steadily high, this does not have to necessarily be the case of business aircraft OEMs. Market competition is far higher and customers have a greater possibility of choice. Together with that the sales are much lower and the book to bill ratio simply cannot reach such high numbers as it does in the airline industry. The more significant point is that the influence of the market declines when business aviation manufacturers can get into significant economic difficulties in almost an insignificant period of time. This is, for example, the case of the Cessna Aircraft Company, which will be mentioned further on in the text.

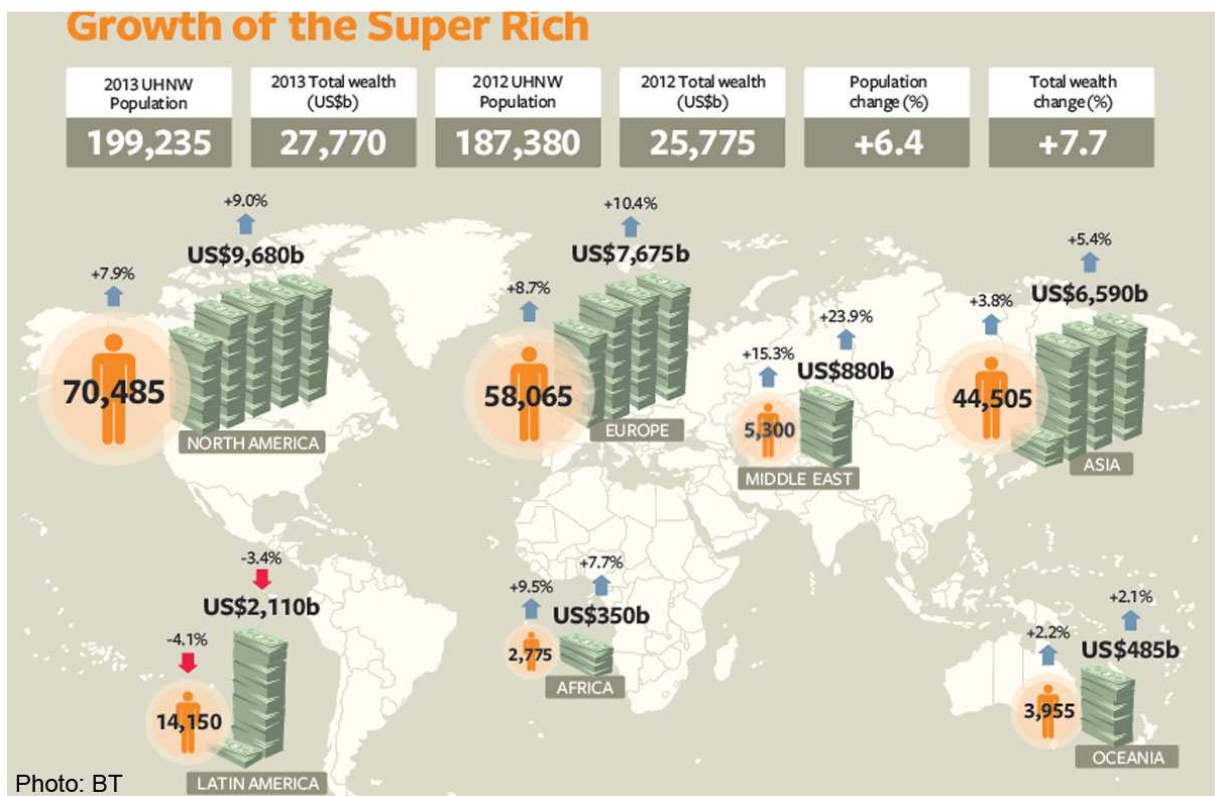
5. Global business aviation market

5.1. UHNWI around the world

All around the world there are people living below the poverty threshold, there are people able to earn a living wage, there are also a middle class and upper class people earning hundreds of thousands of dollars every year. But finally, there is even a world super-rich class in which we may find people whose investible assets exceeds 30 million US dollars. These people are called Ultra High Net-Worth Individuals (UHNWI). (3)

They are almost everywhere on every continent and practically in every country but of course in different numbers. Their distribution varies depending on many geopolitical and demographic attributes.

For example North America and Europe are significant markets for small business jets as there are many UHNWI but most of them have relatively low average investible assets. CIS and Latin America lie somewhere in between as there are not many ultra-high net worth individuals in comparison with the above-mentioned two, but on average there are relatively strong investors buying midsize jets. On the other hand, Africa and the Middle East are markets with relatively few super rich persons, but the wealth of these reaches very high values allowing them to buy jet flagships and bizliners. China and some surrounding countries are a significant market because of its huge growth in numbers and very wealthy corporations willing to buy business aircraft.



1. Growth of the Super Rich 1 (21)

5.2. Role of national debt

Although the level of national debt does not have to have direct influence on the strength of the economy and even less on the business aviation market, we cannot neglect it completely. The vast majority of today's economies are debt funded. Very simply said, it works on the principle that the National Bank issues a certain amount of money. It then lends it to the government and commercial banks for a fixed amount of interest. The borrowers then have to repay the central bank the amount borrowed plus interest. However, as the national banks issue only a certain amount of money, where can the borrowers acquire other money to repay the interest? This money virtually does not exist as it has never been issued – it is repaid on debt. Neglecting exports for now, the national debt in

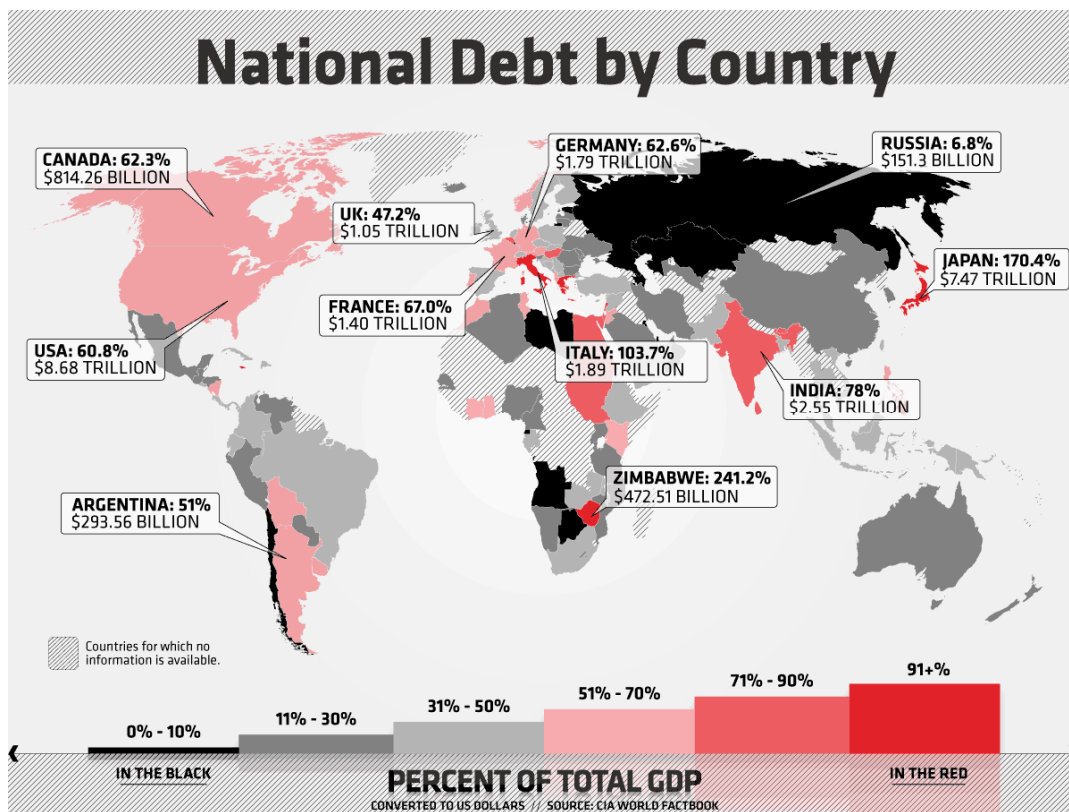
today's economies then has to exist. The matter is how high it is and whether the money borrowed is used to generate profit (added value) or in other words, if they raise the Gross Domestic Product (GDP). If they do so, the country can increase its GDP to generate profit by which all participants will be able to pay their debt interests. Nevertheless if this is not the case, the level of national debt rises and with that even the total amount of interest; later it forms such a huge sum of money that most of the profit is used just to repay the interest not the debt itself. If this circle continues the economy will not be able to repay its debt which will sooner or later, if unchanged, lead to its default.

Some countries have commodities which they are able to export and hence get relatively easy capital to the country. These commodities are mainly natural resources like oil, gas or valuable metals. The risk of default is almost diminished since, if demand for these resources persists, income remains steady and repaying interest as well as a debt is not an issue.

We may examine the level of national debt of world countries not to measure the power of the economy or the size of the business jet market, but to see trends and perspective problems in the future – we may see the ticking bombs which might explode causing an economic downturn. Taking into consideration the world economics interconnection, this downturn will most probably not be only a local but worldwide issue.

The following map shows firstly, the absolute level of national debt, but more importantly as well the debt percentage of the total GDP. Literally it can show the ratio of economical productivity to its

debt, the higher it is, the worse for the economy.



2. National Debt by Country (4)

5.3. World business aviation markets

5.3.1. North America

North America and especially the United States are the biggest business aviation market as well as the market with the longest business aviation history. The largest group of UHNWI is there together with the world's largest cumulated asset. The reason for these facts is mainly historical. Starting with the colonization of North America and the religion of the early settlers, ending with a liberal business environment, the United States have had suitable conditions to become a world business leader. The accompanying factor is that during the last century they were not significantly affected by war and are placed on one complex, climatically opportune, territory.

Even though there are new markets emerging especially in the Far East, the US are still holding their position of the BA center. 5 of 8 major aircraft manufacturers are also located there; Boeing, Bombardier, Cessna, Gulfstream and Hawker Beechcraft.

A negative aspect could be the relatively high amount of national debt, but this is not as straightforward as it might look. In general, the actual value or percentage of the debt is not so important as the ability and strength of the economy to pay its bills even in the case of a market

downfall or crisis. For the national economy to be trustworthy for international lenders, the risk has to be predetermined. Obviously if it is high, the country has a lower reputation in the international markets and hence lenders are more cautious and reserved in their investments. This is not the case of the United States as their risk assessment has a “risk-free” rating. In any case, a high national debt may cause complications in the future.

Regarding the business aviation market, the spectrum of business aircraft classes used is really wide. Being a capitalistic economy, most business aircraft owners initially buy a small propeller and jet aircraft and later with their growing business, upgrading their fleet. Hence the United States is a perfect example of a very wide range of classes and a number of business aircraft in general, which are operated there. According to data from 2012, 12,802 business jets in total were operated there and 8,383 more turboprops which together forms more than 60% of the world’s fleet. (1)

5.3.2. Europe

Being the second biggest business aviation market, Europe is a major player in the field. Due to a strong interconnection between the United States and especially west European states, aviation itself developed almost as in the US. If the States had primacies in certain milestones, Europe had it in others. Due to historic factors, Europe is quite a compartmentalized continent for its size. This practically had to lead to conflicts, of which the two biggest in the 20th century were the World Wars. Exhaustion of economies and destruction of infrastructure was the main cause of relative stagnation in the field of commercial air transport in the black years during and shortly after the Wars. However, massive development connected with wartime aviation was the cause of significant progress afterwards.

Major business aviation manufacturers in Europe are now Dassault and Airbus. Besides them there are several companies which are indispensable worldwide suppliers of aircraft engines and parts.

A significant European advantage which can nevertheless be its biggest disadvantage has already been mentioned: diversification. If a badly-chosen economical strategy is implemented in one country, this does not necessarily mean that other states will be affected as well. The same is true for rising national debt resulting in insolvency. The whole continent is then much less affected than if it had been only one country. This benefit turns out to be a drawback when we look at it from the other side. The ability of economies to prevent default happening in other states is pretty low, but the whole continent is more or less affected. The result is a sort of averaging of the regional economy, which will probably not lead to stellar results, but will be able to sustain any potential crises. With a tendency to join the region’s economies comes the European Union. We can basically agree with the principle, but the way to do it would probably be the subject of a longer discussion.

In terms of business aviation Europe is very close to the US model, however very light jets are represented by a smaller percentage and the total number of business aircraft operated is significantly lower. According to the same data source, in 2012, 2,823 business jets were operated in the area and 1,250 turboprops, operated together forming around 12% of world's fleet. (1)

5.3.3. CIS

The Commonwealth of Independent States is an organization interconnecting 9 of 15 former Soviet Union countries. Current members are Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan and Uzbekistan.

Practically the whole block of these countries were under the control of a communist government in the 20th century. Due to its philosophy, it was almost impossible to develop any private company and certainly not a corporation which is connected with the ownership of a business jet. The view of personal ownership of almost any luxurious asset was strictly negative and sensed as being against the system. The only exception were government functionaries (incl. those in charge of government owned companies), but even in that case it was practically unthinkable to buy western aircraft. However, the Soviet Union had its own capacities for designing and building transport airplanes. We can mention Yakovlev, Antonov, Ilyushin or Tupolev. But due to the very weak competition which was strongly suppressed, the development was much slower in comparison with fully competitive western companies. Hence the dissolution of the Soviet Union in 1991 had catastrophic effects on these companies. Until now there has not been any significant business aviation manufacturer in the CIS.

Nevertheless, this does not mean that there are no business jets. Opening the market in the 90's meant that huge privatized corporations and conglomerates got access to the western markets and started to buy business aircraft. A very significant attribute of these countries, especially in Russia is that it is very rich with natural resources like oil, gas and metals. Export of these highly important commodities forms significant income for the country. It could also very well soften impacts of almost any crisis as it is usually easier to export for a lower price than to restore a bankrupt manufacturing company on which most of the European and American economies are based.

Indeed, business aviation and the spectrum of business aircraft operated in these countries is different in comparison with Europe and the United States. As the majority of corporations which decided to buy business aircraft had already huge and strong companies, even the business jets were from the upper class. Mostly medium and ultra-long range jets are represented there. In terms of numbers, there are registered roughly a few hundreds of business jets, but this number is rapidly growing.

5.3.4. Asia

The Asian market, led by China has a relatively short history regarding aviation or more exactly – business aviation. However, the opposite is true in terms of culture and civilization. Asia is also the largest and most populous continent in the world, what is remarkable is its technological advancement during the last decades. Many say, having in mind especially China, that it is also poised to become the new world leader in the future. Yet the historical development prevented business aviation from developing sooner than in the last decades. China, the region leader, was under the communist regime which prevented it from developing private entrepreneurship from early to high level stages.

In many Asian countries there was for a long period of time, an authoritarian regime with strong military power and not only business aviation but even aviation sports did not have any the chance to develop at all or at least not as in western countries. Therefore airport infrastructure especially regarding small airfields is very sparse.

Nowadays, however, the situation in business is changing rapidly. Asian tigers are investing in the infrastructure as well as into aircraft and so far military airspace is opening for civil use. Being strong corporations and wealthy individuals, they are investing huge sums and entering the market in the highest airplane categories. Hence very successful are there bizliners and ultra-long range jets. In 2012, 1,536 jets and 1,151 turboprops were operated in the area, forming around 8% of the world's fleet. (1)

5.3.5. Middle East

We can say that Middle East is roughly the area surrounding the Arabian Peninsula. It also includes countries in western Asia and Egypt. Historically it is one of the longest-settled parts of the world. We know about ancient civilizations in Mesopotamia and Egypt thousands years ago, in those times it formed one of the centers of the known world.

In the twentieth century, when the importance of crude oil rapidly soared and in the territory rich oil fields were found, strong tensions developed. On the one hand there was NATO led by the United States and the Warsaw Pact with the Soviet Union on the other. Another conflicting factor was the trouble between Sunnis and Shiites. However, there was of course, a period of peace and relative calm.

These days Middle Eastern countries are very important oil exporters, most of them being leaders of OPEC. Just because of the region's natural resources, it became one of the most emerging markets. This is all the more true in the field of business aviation. Saudi Arabia and the United Arab Emirates

are both experiencing triple digit growth, in the first case 146% and 250% in the second. It is very difficult to sell small aircraft in the region hence most OEMs are there promoting their flag ships from categories of ULR jets and bizliners. Between 2006 and 2011, according to the NEXA Advisors, there were 246 new business aircraft deliveries. (1)

5.3.6. Latin America

By the term of Latin America we mean a region which comprises countries south of the United States bordering on the American continent, where primarily Spanish, Portuguese and French are spoken. The leader of the region is Brazil followed by Mexico.

As commercial airlines on such a huge territory operate only to a relatively low number of destinations, business aviation can benefit from its great advantage –flexibility. Latin America and especially Brazil registered rapid development in GDP as well as in numbers of aircraft orders. Even due to the local (and one of the largest) OEM Embraer, Brazil is second after the United States in terms of the number of registered aircraft in the world. In the whole region there were 2,967 aircraft in total of which 1,249 were business jets. (1)

5.3.7. Africa

Africa is the second largest and second most populous continent. Due to geopolitical factors there were relatively low opportunities for aviation to develop in a similar way to Europe or North America. However there are UHNWIs, whose numbers are relatively low, but their wealth exceeds most expectations. This is because Africa is a tremendously rich continent for natural resources like oil, gas, diamonds or gold. Therefore when the rest of the world was struggling during post-recession years, African economies were growing faster than 7% of GDP a year. Regarding business aviation Nigeria is the second fastest growing business jet market in the world after China. The fact helping this growth is a very weak commercial transport network on the continent. In general there were 1,213 aircraft of which 470 were jets making 4% of the world's fleet. Nevertheless in terms of aircraft deliveries it forms 6.5% worldwide.

In terms of UHNWI there are relatively few, but these few have a very high net worth. Their mean assets exceed most of the world average and the planes sold there correspond to that fact. Even though Africa is a relatively small market for business jets, it should be easier to be successful with large airplanes than the small ones.

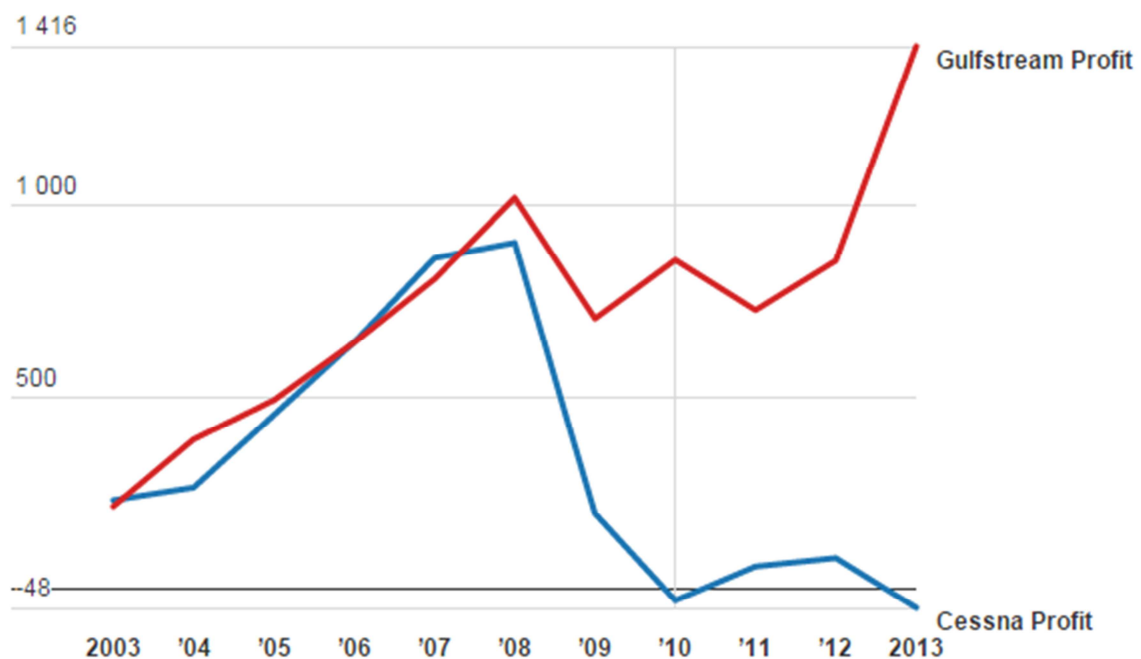
5.4. Business aviation and general markets interconnection

Business aviation might illusionary form “homogenous” part of air transport. It might be seductive to say that business aircraft are that part of aviation which is used for the transport of super rich people

with no significant differences between small jet owners and very large jet owners. Yes, there are these less wealthy ones buying small aircraft and those richer ones buying bigger ones, but what else? Is there any other difference?

Actually there is. Let's compare two companies active in the field of aircraft manufacturing, both playing a significant role but each one specializing in a slightly different part, one in smaller jets and one in bigger jets. These two companies might be, for example, Cessna and Gulfstream.

The graph displayed below shows the dependence of Gulfstream and Cessna profit on time during last decade.



3. Cessna vs. Gulfstream profit (5)

We may see that both companies were very much on the same ship practically till 2008. Cessna made a higher quantity of smaller aircraft while Gulfstream mainly the higher class products for a higher price but with a lower quantity. The situation changed rapidly in 2008 practically from year to year. While both companies saw a significant drop in both profits and revenues, Gulfstream was able to recover very fast, while Cessna was struggling even years later. Surely this could have been caused by management decision of the companies, their strategy and tactics, but the main reason was probably slightly different. The typical customer of Cessna, a buyer of a small business jet is a company or an individual owning a relatively small regional business, surely by the word "small" I mean small but big enough to invest circa USD 5 million for a prestigious vehicle. As there are relatively many in Europe and North America, these are the biggest markets for these aircraft. Their owners use them to travel between business destinations ca 1000km from each other. These can be

typically domestic journeys within the US for an American operator or flights within European destinations for an EU operator. As these people usually have business in one sphere of interest it can be quite challenging to cope with an economic recession. It is very difficult to move their business to a more lucrative and healthier world business area or focus on a more profitable and different parts of their business (as they have only a few of them). Hence they are relatively vulnerable and sensitive to economic downturns. Consequently, they would rather try to sell their aircraft than to buy new ones. Small aircraft manufacturers are then indirectly but very deeply affected by above-mentioned situation.

The situation is a little bit different in the case of large airplane OEMs. Their typical client is a multinational corporation or a very wealthy individual that has diversified businesses or investments all around the world in more than one field of interest. Economic downturns are more easily solved by maintaining profit in healthy markets or spheres of business. What is even more important, even if the investments for larger airplanes are indeed higher, the relative percentage of money in a company's budget will be mostly lower and hence ownership of even large aircraft can be a lower financial burden. Therefore an economic downturn does not have to lead to aircraft sales in as many cases as it does in an area of smaller business owners. As a conclusion we can say that manufacturers specializing in bigger business aircraft can overcome local and even global financial crises easier than OEMs specializing in light business jets.

5.5. Reasons for aircraft acquisition

As it was stated before, there are various reasons for aircraft acquisition. Mostly, the main arguments are really true benefits of business aviation. These are safety, time efficiency, flexibility in time and destinations and therefore higher productivity. But, there are factors, the omission of which would be grossly disparaging. The most important of them are psychological factors like ego, image and prestige. There are many business jet purchases empowered solely by these, certainly conditioned by a buyer's financial wellbeing and (at least) not pessimistic future prediction.

During recent economic bubbles, about which we will talk later, we could see something like a chain effect of purchases as well. It is caused merely by psychological factors, which I have mentioned above. During a bubble, when basically everyone sees his future positively and it is very easy to get a loan from a bank so "everyone" has the money as well, we can see that image starts to play its role. The whole situation can be best described by sentence "They have a plane, we will have it as well." This leads to a series of unfounded and debt funded acquisitions which therefore consequently deepen the crisis. We will talk about this issue later on.

Surely, there are also other factors which may lead to the purchase. Even though these form only a minor part of the statistics, we will have to mention them on account of complexity. By experience, we know that some airplanes were bought for money laundering purposes. These become part of total acquisitions statistics, but then do not actually fly. Tracing these acquisitions is extremely difficult and because of forming only an insignificant part of the market, we will exclude it from further considerations.

6. Characteristics of used business aircraft market

Many think that the used business aircraft market is similar to that of luxury cars, archive wines or generally speaking luxuries. In other words, it is clear why older business jets rise in value as they get older, simply because there are only a few of them. This is unfortunately not the case. Although the business jet definitely is a symbol of luxury, from an economic point of view it does not behave like a luxurious asset. With very few exceptions, their value does not rise in time because of the scarcity or because of buyers acquiring them for collecting reasons hence paying huge sums of money for them. The opposite is true, as the market is burdened by ego and prestige. Owners want to buy mostly the newest top-of-the line flagships and the best of the best available on the market, certainly, if they can afford that. For many it is financially unacceptable so they buy older models for a fraction of their original price, so that they can avoid sometimes years of waiting time when ordering brand new aircraft. Therefore, the used jets market rises in eras of economic growth because many people have the money and want a plane as soon as possible even if it's older, on the contrary it can rise or at least slowly sink in times of economic downturns because the price of older aircraft is, as has been mentioned, lower which makes it more affordable to a perspective buyer.

It is at least helpful to have a basic idea about the used aircraft market in terms of numbers of aircraft for sale and the trend of this number. Unfortunately statistical data might be influenced by many factors. One of them is selling the aircraft for appearance's sake. In bad economic times ownership of an expensive business jet can be a publicly stodgy issue prospectively damaging a company's PR. Hence there are known examples when owners putting an aircraft on the market for an unacceptable price to say "yes, we do have an aircraft, but we are trying to sell it" (AIN, 10/2010), these aircraft can be on the market for a significant period of time (the record is 3900 days). On the other hand, there are aircraft on sale which are not yet in operation. This is the case of the future owner already paying most of the price of his not-yet-finished aircraft but usually entering unfavorable conditions in which he knows that the operating of a jet will be financially unacceptable and practically unnecessary. The solution is paradoxical - to put a completely brand new aircraft on the used jet market.

Including all of these anomalies according to Aviation International News (6) the average time an airplane was on the market was 500 days in 2010. However numbers closer to reality gave by K. Harrison (7) are stating it was 139 days in 2008 increasing to 248 in 2009 and 344 days in 2010. There was a total of 2,750 aircraft on the market in 2010 decreasing until 2015. The latest data (8) say there were 2,275 jets on the used aircraft market in 2014 forming 10 percent of the fleet. The average number of days the airplane is on the market was reduced from the above-mentioned 500 to 351. However these are saying only a little about the real situation as there are aircraft like CJ3 which turns over in 154 days as well as e.g. the Challenger 604 the average turn-over rate of which was 112 days on the US market. This might however vary between the markets as, for example, Europe tends to have aircraft on the market for a longer period than the more active market in the US.

In terms of aging aircraft, according to (8) there are 4,775 jets on the market which are 25 or more years older, of which circa 800 or 17 percent are for sale. Generally speaking, there are twice as many planes which are 20 or more years old than these which are up to this age. This influences the aircraft sale price, which further decreases due to strong supply. Another factor which forces the price of old aircraft down is limited airframe and engine time before overhaul. Most of these planes are approaching their, very expensive, inspections limits making them less valuable on the market.

According to aircraft classes, there is definitely a shorter turnover in the field of large cabin and super-midsize jets than there is in the class of very light and small cabin jets. For example, even though there were only 9 Gulfstreams G550 in the middle of 2012 and this number more than tripled in 2014 to 32 aircraft for sale, it forms less than 7% of the fleet which counts more than 450 aircraft. By regions in terms of percentage, most of them are for sale in Europe, precisely 16%. There are far fewer in Asia, forming only slightly more than 8% of the local fleet. In these terms the United States is definitely a healthy market with only 3.6 percent for sale from the local 250 aircraft fleet. However these small percentages are not to be generalized for the whole large cabin fleet. For example, numbers for the Falcon 900B are less optimistic with 34 pieces for sale forming almost 20% of the active fleet. Contrary to that in the field of small jets Embraer Phenoms are doing pretty well. (9) There are only 5 percent of 200 airplanes of the active fleet for sale as well as Phenom 100, counting the same 5 percent of 300 of their aircraft fleet. Most of these aircraft are based in South America benefiting from local loyalty to the brand.

From the trends developing between 2008 and 2010 where the numbers of aircraft for sale were rising, till now from 2010 when the number is gradually decreasing, we may say that the market is stabilizing and finally finding a new balance. This helps us to come to the conviction that the situation in the following years will be further improving helping the market to grow.

7. Market behavior and predictions

7.1. Economic bubbles

The global market is under normal conditions like a ship in a big opaque bubble. We know it is there, but it is very onerous to see, how exactly it is formed and how does it actually work. An economic bubble then works like a compressor inflating this bubble around the ship, when it bursts, it is much easier to look at it and figure out how processes and structures, which are there, actually work. The global market is pretty much the same. Before bursting housing bubble in 2008 only very few people could foresee aftereffects which it really had all around the world and how is global economy interconnected.

By this paragraph I did not want to say that it is impossible to describe the global market more in depth, but that it is so complex that an economic bubble burst can show the fact that would be very difficult to see under standard conditions. The complexity is also the reason why its in-depth description cannot be part of this thesis. However, what can be its part is a principle of how economic bubbles affect the global business aviation market.

In the section about reasons for aircraft acquisition I have mentioned that during an economic bubble it is very easy to get a loan from a bank. This can but does not have to be true, but at least, it will be much easier for a vast majority of the corporations. By this we get to the structure of the financial system and one of its essential components – the banks. How do they work, from where do they get the money and to whom do they lend it?

Very simply said, if a corporation or an individual needs money, it goes to the bank. There he is rated for its credibility and if it is sufficient, the bank lends him money – for a certain profit, indeed. This, sometimes significant, sum of money the bank has to get. For most of them, only their gain would not be sufficient to cover their costs, build needed capital, which will be further lent, and produce certain profit on which is the business based. For this purpose a bank sells bonds to its investors, who invest their money to the bank and this money then forms the capital of the bank. As selling bonds is not the only source of capital, the banks can borrow money from the government as well. The higher capital a bank has the more money it is able to lend and hence the higher the profit it can make. Therefore if there was a possibility of getting extra money at a low costs, the bank would be the first one to get it. So if the national bank lowers the interest rates, these conditions might form quickly. They are accompanied by the fact that investors, who were buying bonds from the national bank, are no longer interested because of lowered interest rates, so they rather give their money to the commercial banks. These now have multiple sources of credit and are able to lend money to more

and more borrowers and multiply the profit from them. This borrowing money to amplify the outcome of the deal is called leverage. During inflation of the bubble this is used more than anytime else.

The important factor is that the bank does not lend to everyone for the same interest rate. Based on individual credibility it increases interest rates for lower rated, hence high risk clients and vice versa for higher rated ones. To some of the lower rated ones the bank under normal conditions would not lend money at all because of inadequate risk. But during the bubble it starts to be different. The bank can also resell bonds to investors, making a profit from that. As everything goes well, investors are receiving regular payments from the borrowers getting their money back and as surplus to that, making very interesting profit. Therefore they want more and more debt obligations, but banks are running out of safe investments. Having no risk after reselling the obligations to investors, they start to lend money to less creditable borrowers, even to those who under normal conditions would not reach to the loan. Because of that it might not be easy to find them, they pay brokers to do it. The argument for the lenders is the fact that practically all the loans are backed by an asset whose value is (for now) rising anyway so if anyone default on his loan, it will be covered by the asset. This one can be a house, a company, a car or e.g. an aircraft. They all are happy, the borrowers can buy what they want, brokers get their commission, banks their profit and investors huge returns on their investments, much higher than what they could get buying government bonds.

The problem begins when more and more low creditable borrowers begin to default on their loans. Firstly lenders can sell their assets, but as there are more and more of them on the market their value begins to drop (Housing bubble) and companies financed by these loans will now turn out to be overvalued (Dotcom bubble) as they were receiving high risk unfounded loans. Banks now have plummeting unsellable assets and loans which are about to convert into one of these and which investor does not want to buy any more. However they already borrowed money to be able to grant these valueless loans, so now they have to pay but investors does not want to buy any more. So do not want banks from brokers and the financial market is frozen during a very short period of time. Under these conditions it is only a matter of time when one of the big financial players defaults on its loans and gets bankrupt. The chain effect forms and a crisis of credit is born...

7.1.1. Dotcom bubble

The dotcom bubble, the internet bubble or the IT bubble are names for a speculative bubble which was formed between circa 1997 and the end of the millennium. Large advancement in information technologies and especially the birth of the internet as we know it in 90's had great impact on

culture and commerce. Communication was rapidly facilitated not only in case of interpersonal channel by mainly in terms of business communication and business to customer sector. Development of electronic payment methods made world of business easier and incredibly faster. These conditions lead to the setup of new companies specialized solely or mainly in internet business. Many existing corporations had to keep pace with the times and converted parts of its business to the field of “web”. The feeling of the boom was so strong that to increase stock value it was sufficient to add “e-“ as prefix of the company or “.com” as a suffix. This might be called prefix investing. (10)

The power of psychological importance of technological advance was so strong that many investors did not take into consideration basic principles of investing. They invested huge sums of money into the rising-value companies just because of awaiting further increase in value, rather than buying undervalued stocks. Therefore yet overvalued shares soared to even more unfounded values. It was believed that the key to the success was to get huge client base in the shortest possible time. Under the fact that companies were not short of money, this led to huge investments in advertisement. It is known that for a 30-second spot during American football game Super Bowl XXXIV. in January 2000 16 dotcom companies paid more than \$2 million. Unfortunately none of these companies registered significant increase of value of their stocks afterwards. (11)

Inflation of the bubble was amplified even by city governments which invested into infrastructure, optic cable lines and office buildings due to vision of being next “internet silicon valley”. In many areas technology firms got tax exceptions to intensify their growth.

However, the market turned down in March 2000, where the NASDAQ index peaked at 5132.52 points and begun its drop down to 1114.11 which was reached two years later in October 2002. (12) The reason for that was a combination of various factors. The main of them was the fact that many of highly overvalued companies turned out to be unprofitable. They were focused on being huge and having the widest customer base but omitted to be profitable for their investors. Its influence on deepening the crisis had the Worldcom scandal in 2002 as well. One of the major communications corporations was found using illegal accounting practices to exaggerate its profits, afterwards leading to its bankruptcy.

Another significant part on deepening of the crisis had also 9/11 terrorist attacks on World trade center which for a short time paralyzed the US stock market and induced further decrease on the market.

Later, when world's largest bank HSBC Holding conducted a research based on P/E ratios it found out that new IT companies were in average over-valued by 40%. This, to be correctly valued would mean an average growth in profits of 80% over the 5 consecutive years. (13) Such a rapid growth is practically impossible to meet even for rapidly growing company.

Generally we can say that the following recession lasted from 2000 till 2003. As any other recession it had negative effect on especially the US but at least partially even the world economy, but we cannot neglect even positive factors which resulted from the bubble. These are remaining and functional infrastructure, born of world leading companies in IT such as Google.com, Amazon.com or eBay.com and better risk assessment on the markets.

The influence of the crisis was most remarkable in the USA, however its effects was striking in Europe as well. Nevertheless it was diminished in Russia due to its gas and oil exporting industry and fresh recover from the 90' crisis.

7.1.2. Housing bubble

The Housing bubble resulted in the biggest worldwide recession since The Second World War. Its overall impact is highly discussed but generally it can be said that it at least partially affected regions all around the world.

It started in the United States after the recession subsequent to Dotcom bubble, but it would be odd to think that the US economy affairs were the only cause of the bubble. However, as their economy is the world strongest one and linked with many others, it was most probably the main factor contributing to the fall of global economy in 2008. Generally it can be said that during years and in some cases decades before the crisis world economies were heading towards small recessions forming more and more pulled chain, it was then only a matter of time when it breaks.

Due to politics in early 2000, which goal was to make ownership of a house accessible for any American family, were the regulations affecting financial institutions weakened. Together with lowered interest rate this led to easily accessible capital. Firstly banks were able to lend money to their primary creditworthy clients forming safe investments, but secondly they were able to lend money to clients with higher default risk as well. This was for the banks compensated by higher interest rates.

However the financial system is much more complex, following simple amplification should be however sufficient for our purposes. There is not relationship only between loan takers, banks and

the national bank. There are as well brokers in between banks and investment banks lending money to commercial banks and finally investors investing their money into investment banks.

Unimportantly whether it is an investor or investing banker, everyone investing actually buys an “asset”. This is called debt obligation. Taking together safe, medium safe and risky obligations we can form so called collateralized debt obligation or CDO. These are made by investing banks and resold to investors, hedge funds etc. depending on the risk taken. All these people can make quite a lot of money from CDOs receiving monthly payments as debt installments plus interests from primary loan takers – mostly home owners in this case. So they want more of these, but the brokers cannot find any more safe prospective homeowners looking for a mortgage. Hence they find less safe and less responsible homeowners to whom they offer so called subprime mortgage. These are connected with higher risk but compensated by mentioned higher interest rates. As everything is secured by houses whose prices were always rising, there is no need for proof of income and no down payment is required, it is basically free money for everyone. Everything works well until more and more homeowners become default on their subprime loans. Their homes are now for sale, a lot of them. The oversupply then stops rise of housing prices and what is worse, it makes them drop. The assets hedging CDOs are now becoming worthless. The investors do not want them anymore, the investing banks do not want any more debt obligations and commercial banks do not want any more services from the brokers. However everyone already has borrowed money to invest them into their debt obligations which he cannot repay now, nor is there anyone to buy his obligations. The whole market is frozen and it is only a matter of time when the first huge financial institution collapses. This happened on September 15, 2008 when the 4th largest US bank Lehman Brothers declared bankruptcy causing panic on the global markets. What continued was “run on the banks”. People being afraid of losing their deposits started to withdraw them. This led to further worsening of the situation by further decapitalization of the banks. The market suddenly became frozen. Even healthy companies financing their operation by short term debt could not continue production having troubles to borrow money even if they could afford to repay them. The whole situation helped to culminate similar pending problems in European countries as well. Huge debts in Spain, Ireland, France, Italy or Greece were just ticking bombs, but affected was practically whole world. Surely, the point is how much. While the US were hit badly, closely followed by Europe and to both it took years to recover, Asian and Russian markets did much better. We may see a drop in their GDP as well but due to their strong economy or natural resources respectively it was only a matter of circa 2 years to recover. The same situation was in the Middle East due to same reasons.

Business aviation closely connected to the economy followed the negative trend. Shortly after the bubble burst it was publicly unacceptable to own a business jet. For example it caused a scandal

when CEOs of Detroit's Big Three auto companies flew in their business jets to Washington to plead for government bailout. (14) That was the reason why some companies had to sell their bizjets to improve their damaged PR. It is by the way one of the cause while a vast majority of business jets does not have owners branding like most commercial airliners. Besides huge international corporations, many light jet operators had to sell their business aircraft as well. Now it was not the matter of a few examples following public relations reason, but of real economic difficulties. It became nonsense to operate a business jet in relatively slow business the more not under the pressure of lower profit and need of economy drive. However the situation outside of the United States and Europe was different. We may say that companies owning businesses in less affected parts of the world contrary started to fly more in order to promote them.

Even due to the crisis, but not only because of it we may say that the economy scissors opened further more. Less rich people became poorer while very rich people got wealthier. This plays into the hands of large jet OEMs while decreasing sales of small jets manufacturers as we may see from the graph listed in the section *Business aviation and general market interconnection* above.

7.2. The Law of Stability

Another convenient name for the Law of Stability would be the Law of Predictability. The principle is in an assumption that a stable market is predictable and if it is predictable it will be opportune environment for big businesses like jet aircraft sales.

Business jet acquisitions are conditioned by numerous attributes, like company financial well-being and positive outlook into the future. These two of them are probably the most important issues in this case. The company will be less likely to make such a great investment if it is unable to predict market trends and hence its own situation in few years' time. This might be especially the case of the period after bursting of the Housing bubble in 2008 practically till 2014 or even 2015. The influence of this bubble was huge even years after it, not because there were significant reasons for market slow down, but because of the increased volatility and instability of the market. During this time, we can hardly expect a significant rise in values and rising volumes in sales. On the contrary we can expect hypersensitive reaction of the market especially on negative news. Pretty good examples are events in 2011 which are more thoroughly described in the Market situation section later on.

When examining the market behavior and taking into consideration the fact that one of the conditions which should be taken into consideration is the economic situation and forecast, we can very well get to belief that the economic indexes should correlate with the business aviation market.

If this was true, we could get actual data about business aviation market practically in real time. Unfortunately this does not appear to be the case.

Looking at the development of Dow Jones Industrial index and NASDAQ Composite we might see relatively stable growth from 2008.

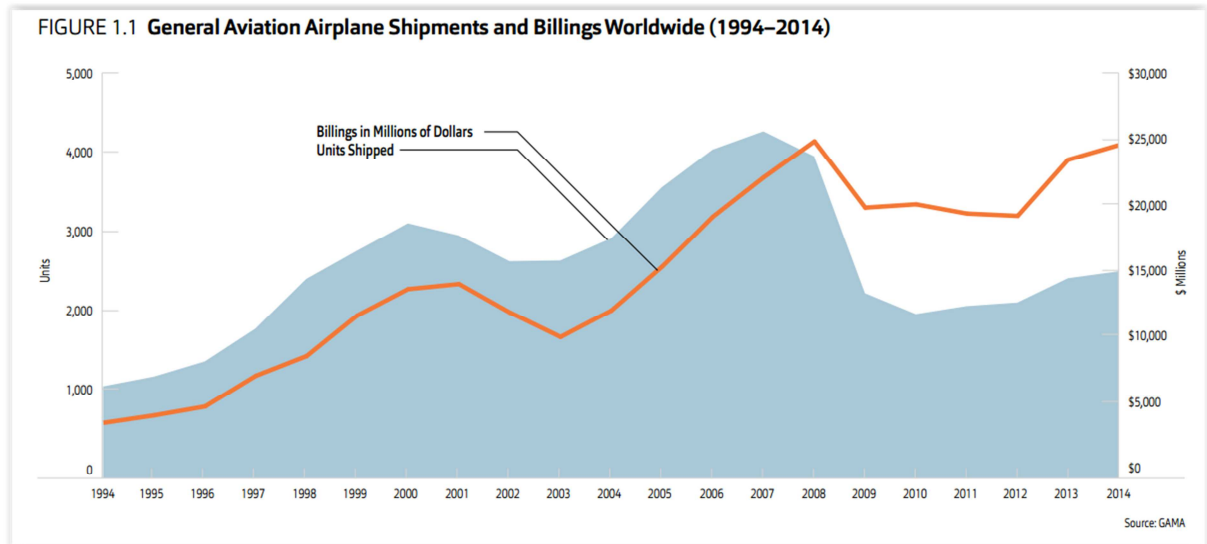


4. NASDAQ Composite 1995-2015 1 (15)



5. DJI 1995-2015 1 (16)

While if we examine airplane shipments and billings, it does not correspond with the above mentioned graphs at all. Having only yearly or quarterly data the graph cannot be so detailed like in case of indexes which are updated every single minute or even less. But we can easily see that when indexes rise almost instantly after crisis, airplane shipments do not have to do so. This is especially case of years since 2008.



6. GA Airplane Shipments and Billings 1 (17)

A very probable cause of that fact is the duration of healing process of the economy and uncertain or unstable situation during that time. Hence we can say that usage of economic indexes might be an additional factor which we could observe but is not an indicator directly showing the jet aircraft market situation.

The Law of Stability is especially the case of business aviation. There are only a few industries that are so sensitive to market stability. The reasons for this fact are huge financial amounts needed for the acquisition of one object and the verity that business jet is an expendable luxurious asset and not the core part of most businesses. So the acquisition might be postponed without very much affecting the core business itself.

Finally as a conclusion we can very well say that we have to make the market stable to make it rise.

7.3. Theory of factorization

In order to predict future trend of the market, basically we know that only knowledge of the general present situation is not sufficient. Even if we take into consideration past market movements in general, it will be very tricky to predict the future from such a complex status. The problem is that the present situation is not a homogenous state which can be easily described and predicted. There

are several influencing factors which differently affect different parts of the system. But in fact, the present is nothing more than the outcome of past events, which can be, but does not necessarily have to be dependent on each other. The same in composition used to be the past and more importantly, the same will be the future - simply built up from several parts. If we were able to factorize present and thus divide it to well defined factors, whose past behavior we know, we shall be able to predict every single one of them and reunite them into one complex situation. This situation will be the future.

The challenge is to correctly determine if possible all the major influencing factors, predict them with reasonable success rate and join them back together. In case of many of them, we can be quite precise, such as aircraft aging or new type's development. Some of them are more difficult to determine, an example could be the current market situation and its possible trends. Finally we have to say that there will always be unpredictable circumstances like political situation and mostly price bubbles.

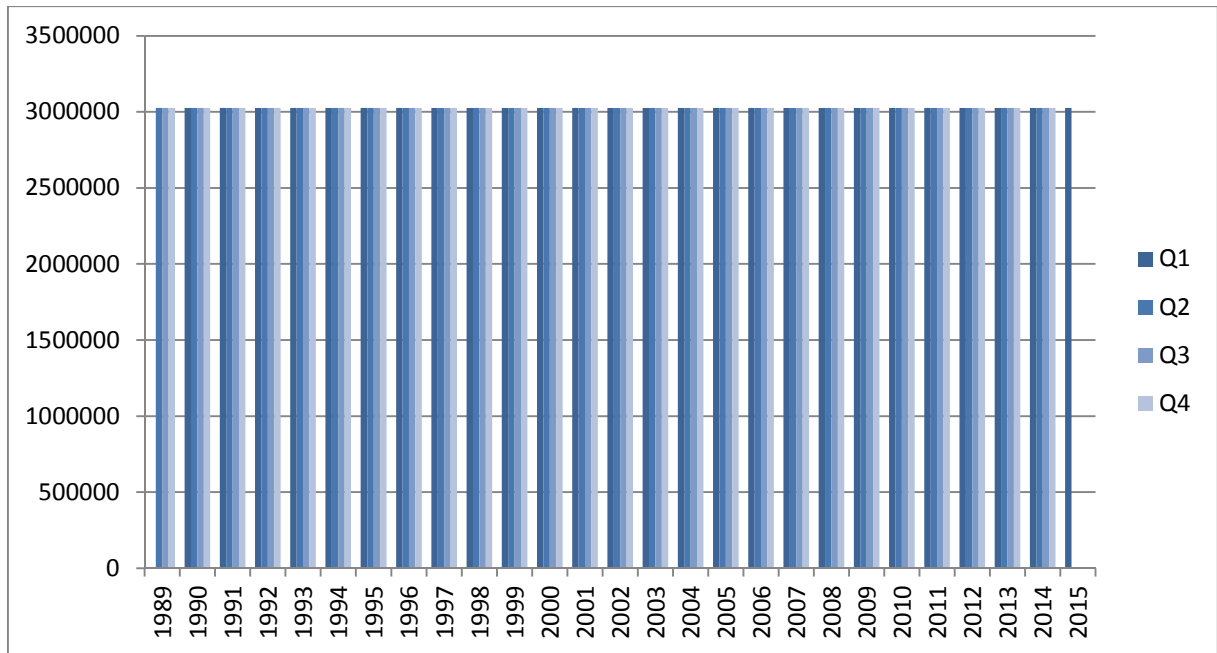
Obviously, we will never be able to determine the exact price of concrete aircraft at the specific time in the future, but very probably we might be able to predict future trend and determine which aircraft will be most likely to rise or lose in value in time of circa 2 to 4 years and hence answer the question – to sell or not to sell.

The following lines will describe mentioned factors more in depth.

7.3.1. Ideal aircraft

At first, let we have an ideal aircraft in an ideal condition. This will not be losing nor gaining value in time and we will be able to sell it for the purchase price anytime in the future.

It's graph showing dependence of price on time will be constant.



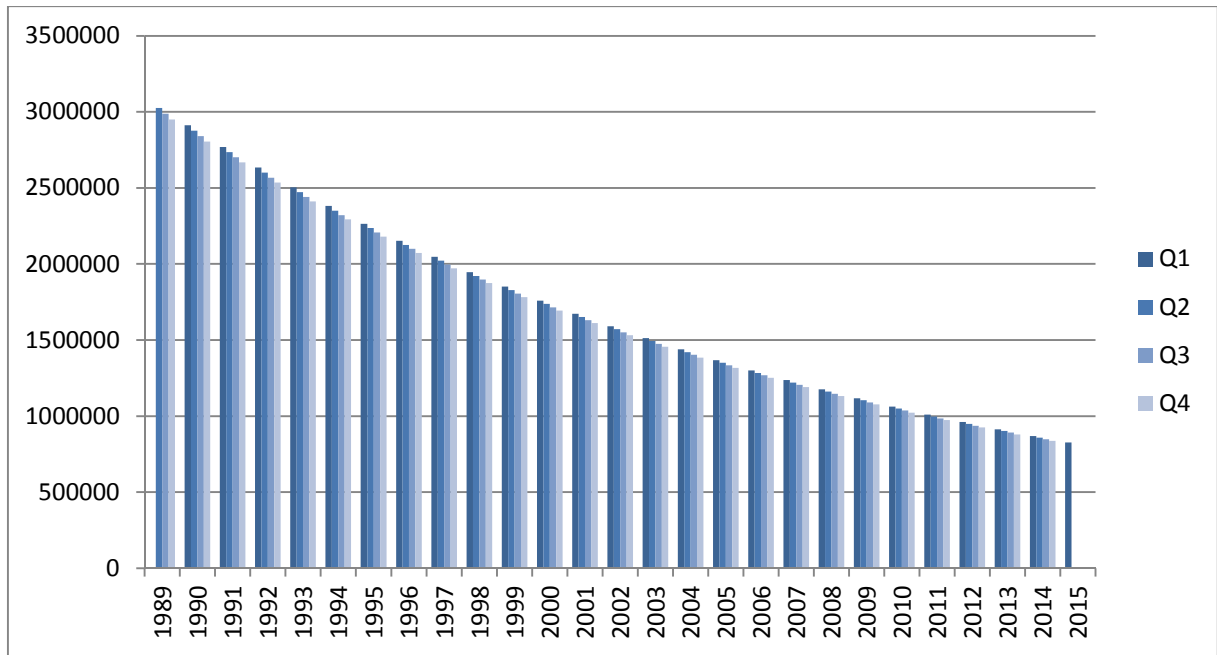
8. Ideal aircraft

Certainly, there are significant effects which move the trend outside of the scope of this graph.

8.1.1. Aging

Probably the most significant one is aircraft age. As in case of most machines, even aircraft is losing value every day as it gets older. There are many reasons for that, but in fact it does not have to be so easy to determine them correctly, or to be more specific – to identify the main ones and determine their concrete influence. If we exclude certain types of luxury goods which might be rising in value with increasing age (like some vines or cars), we may state that as an asset gets older its value drops, but why exactly? Empirically we know that the older the thing is the less value for the buyer it has, but not only for the buyer, for the seller as well. Therefore a new equilibrium will be formed with price the lowered by a certain percentage. Contributing influence on this fact have higher predictable as well as unpredictable costs of maintenance and system upgrades, but to great extend even psychological factors connected with ownership of older aircraft.

For our purposes we have to determine the average percentage value drop per a period of time. From historical records we know for which price concrete type of aircraft, built in certain year, was marketed. Connection of these values on a graph showing dependence of price on time, similarly as in previous example, gives us a starting position for the computation. We suppose that the drop will be exponential, or by other words, that e.g. every year the value drops by a certain percentage. This means, that largest absolute drop will be for the first years of newly built aircraft and gradually decreasing as the aircraft gets older.



9. Aging aircraft

To get an age-affected price p_a influenced only by aging, we can use below mentioned equation,

$$p_a = p_{bn}e^{zt}$$

where p_{bn} is price of brand new aircraft when entering the market, e is Euler's number, t is time passed from aircraft entering the market and z is constant of decline. The core part of the equation is just z ; the exact decline and therefore actual price in the future depend on its value. Theoretically, we can compute it from real data by linear regression using method of least squares, where we find minimum of $p_a = p_{bn}e^{zt}$ and p_{real} which is real empirically obtained price at time t .

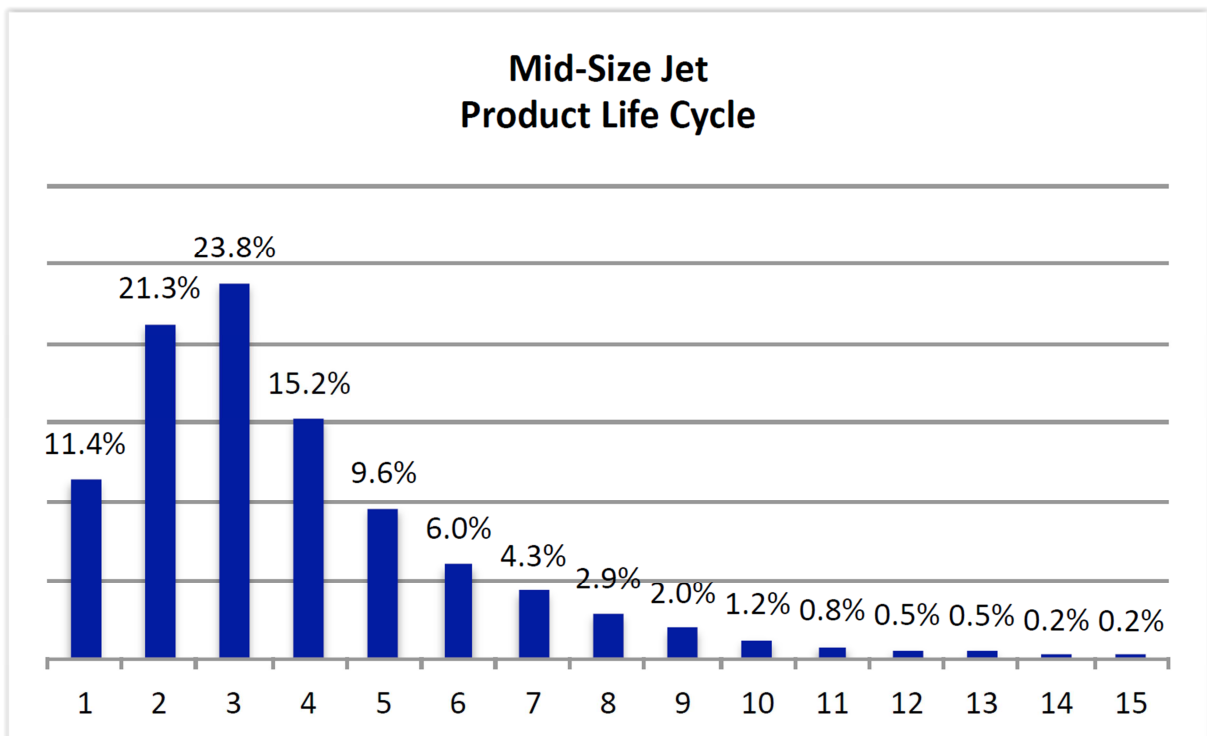
Certainly, the more of empiric data we have, the better the accuracy of z is. We can be quite accurate with around 80 values, but this number can be substantially reduced when measured outside of significant market imbalance end excesses. In most cases, it is quite challenging to obtain relevant numbers for new types which are just entering the market as their price tends to remain constant or almost constant for the first few years thus distorting the calculation.

An interesting exception from "constant price market entering" is the Embraer Legacy 600/650. As it is based on the Embraer ERJ 135 regional jet it might be said with small exaggeration that Legacy business jet was actually 12 years old when introduced on the market in 2002. This statement could be marked as unimportant, because the actual Embraer Legacy 600 was a real newcomer on the business aviation market and hence should behave like any other one – but it does not. Its price was almost steadily decreasing and was almost immune to strong influences which moved the price levels shortly before and at the turn of the first decade. But could that be a rule? Hard to say...

9.1.1. New types development

As aging aircraft is continually losing value by getting older and older, hence becoming less attractive to perspective buyers, so does the aircraft which is no longer OEM's flagship or which is no longer in production. The reason for that is mainly psychological. It is quiet cool to own a flagship – the best of the best and many tend to pay huge sums of money for that image. But it is not the matter of image only, indeed. Owners of business jets usually try to keep in-warranty, maintain predictable operating costs and take advantage of new modern technologies.

The following graph indicates the average production output for 22 midsize jets made in past 40+ years. We can see, that by the 7th year from delivering new model to the first customer, more than 90% of complete production is already sold.



10. Mid-Size Jet Product Life Cycle

On the market the balance was established at around 6-7 years cycle. This means that manufacturers have to launch new models quiet frequently to attract their clients and their clients have to buy new aircraft fairly often to keep up with the market. It also means that price rise after the 7th year from introduction is less probable, however still real as we know from the historic data.

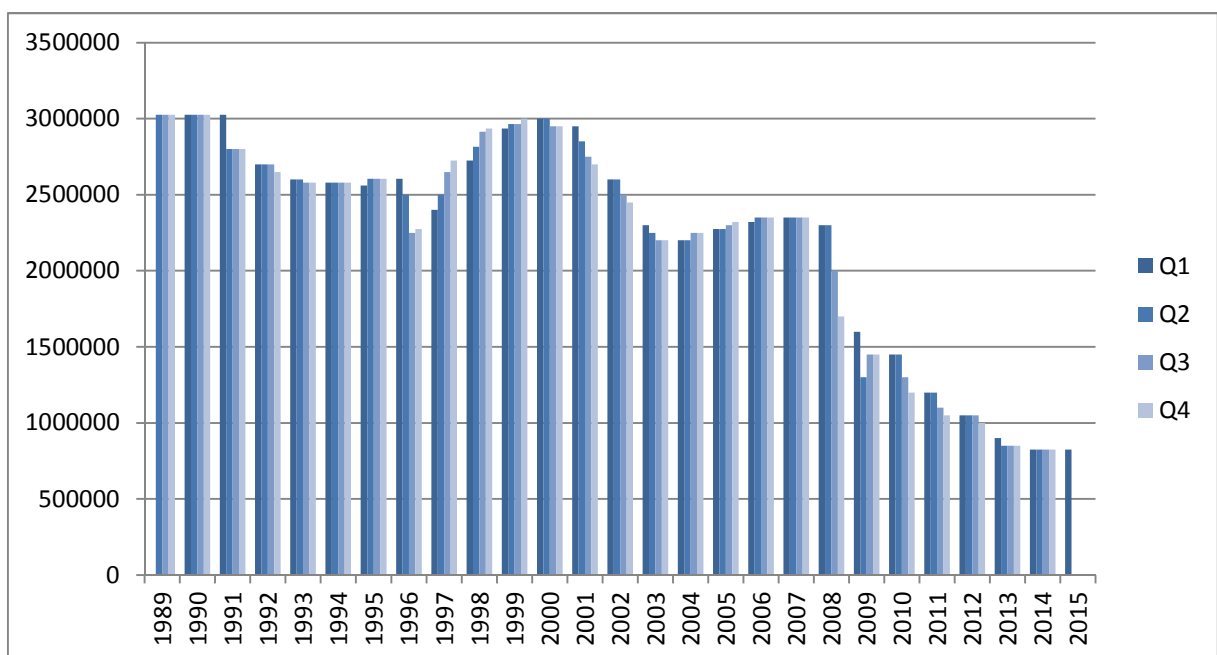
10.1.1. Market situation

Now we are getting to factors which are much less predictable. In case of the market situation we actually can analyse the current situation and determine in which condition the market is. But we are facing the problem that actually every recent data are becoming the historical when we can already

analyze them. We can get some of them pretty soon in terms of hours or days (like economic indexes, stock situation etc.) but some will take months (e.g. situation on the jets market). Now we have to solve the dilemma of what actually is the “current situation” in practical sense of meaning? Is it everything what happens just now? Or today? Or this year? It actually should be a combination of these attributes, let’s see why.

Mostly when it is possible to read about price drop in newspapers, it is already too late to sell for the original (higher) price. And what is worse, it was actually late months before that, because it usually takes around a year to complete the selling process. As mentioned above, every information is published when it is identifiable, for some of them it means almost immediately, for the rest with considerable delay. Therefore, regardless of commencing a deal or not, the market is influenced not only by current, but even by past events. We have to analyze as many as possible of them to make a mental image of the situation. Hence present for this purpose will not be only present as we know it, but rather compilation of present and past.

What is in a field of interest is not an absolutely calm market which follows mostly the aging curve, but an active market where are market forces causing, or about to cause significant imbalance. It might not be a surprise if I say that these active markets are in vast the majority, but contrary to that, it might be a surprise if I say that in case of some aircraft the price in the first 15 years of their life was rising almost as long period as it was decreasing. The following graph represents the real price development of the above idealized aircraft, it is concretely a Cessna Citation II 550 made in 1989.

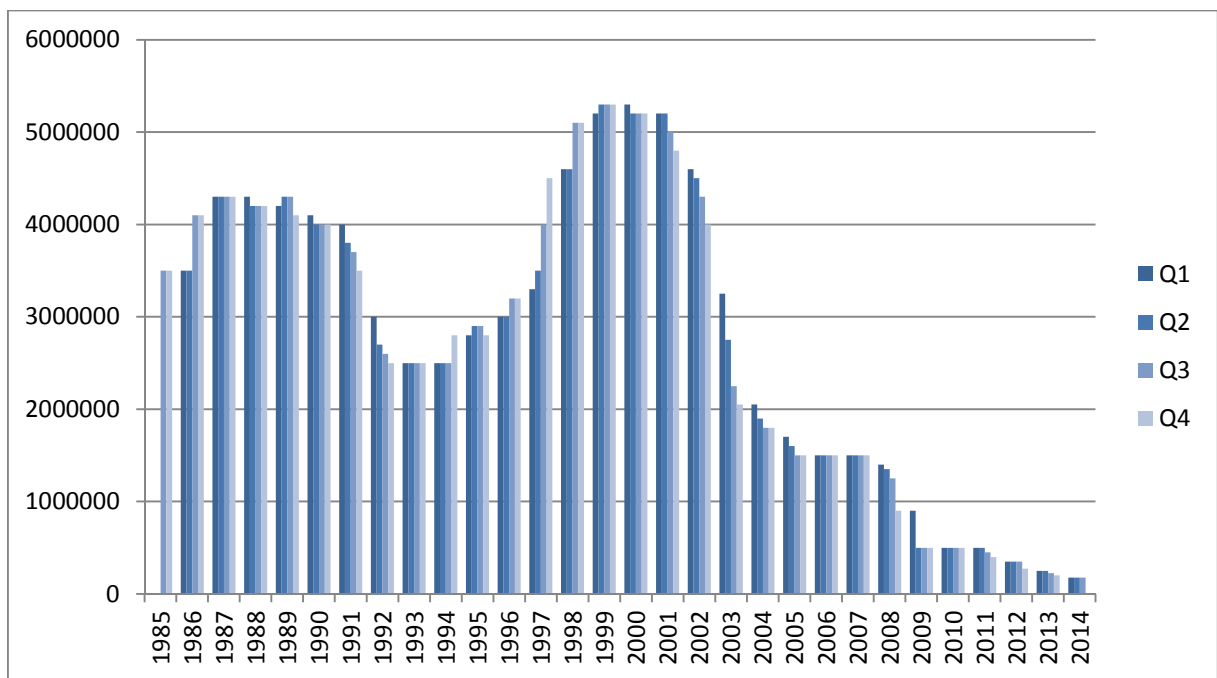


11. Cessna Citation II 550 (1989) (18)

Even though we may identify exponential decrease in the graph, it is far from ideal course. Taking exponential as reference line, we can consider that every rise or drop above or below it results from real events. To determine whether we can or cannot predict these movements, it is crucial to determine by which events they are caused. How big are they? Which nature do they have? What is their extent and which aircraft are affected? Although it might sound clear, only very few people can determine the correct answer by heart for these questions which help us to get closer to the goal.

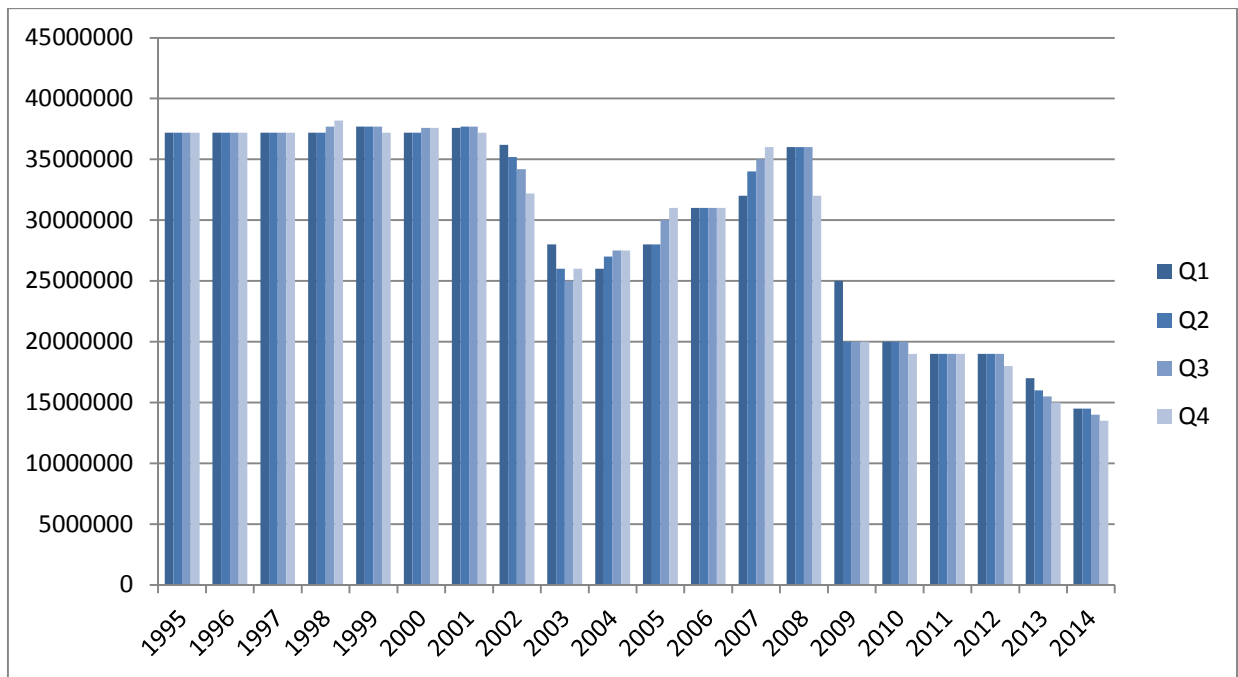
To exclude the possibility of local imbalance affecting one type of aircraft only, we may compare more graphs representing moving values of wider airplane spectrum. It will have to be same class representing at least partially substitutional products, indeed.

Lower there is graph of Gulfstream GII made in 1979, data from 1979 till 1985 are unfortunately unknown.



12. Gulfstream GII (1979) (18)

To represent even newer aircraft models, lower graph shows dependency of value on time for Gulfstream GV made in 1995.



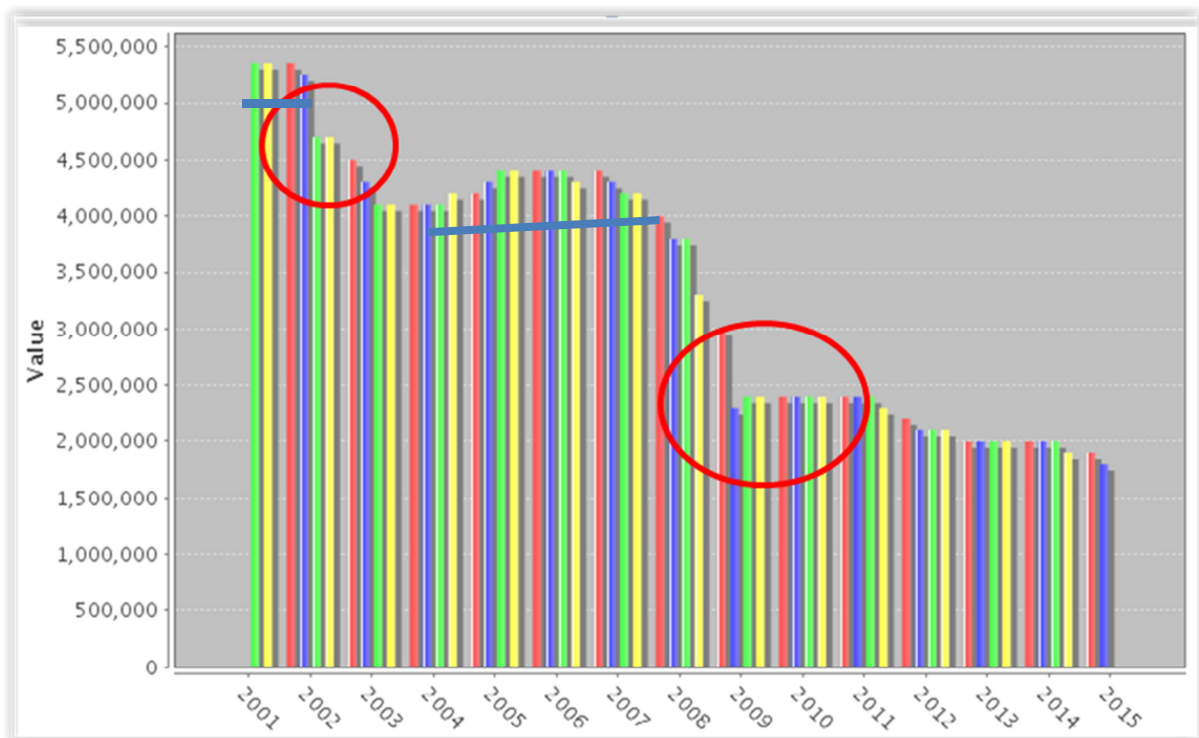
13. Gulfstream GV (1995) (18)

Very similar progress is mutual for vast majority of business jet aircraft made in past 30+ years.

What connects them especially is a significant rise and following slump at the turn of the millennium and before year 2008. Something which is able to raise values of quiet aging airplane by hundreds of thousands dollars or tens of percent within few years' time simply cannot be insignificant event.

Taking into consideration fact that business jets are a product which is more or less directly connected with economic well-being of the company, we should be looking for the cause in the sphere of economy. Finally because of the truth that practically every model of almost any age is affected, it will not be only local but global economy. This reasoning narrows the field of possible events practically only to huge economic bubbles. In these cases we may talk about Dotcom and Housing bubbles. As these are the major cause of any jets market movement, they are subject to separate part of this script and we will exclude them further below.

For now post-crisis development and the market between the bubbles will be the issue. If we look at the graph representing jet price development in the past 30 years we may find that after different interruptions of the similar nature, the market very often appeared like corresponding with the same trend line. Certainly it is not by the same values, but it is by a very conformable trend. Examining the reasons of such interruptions, we cannot help ourselves to come to the confidence that this is simply not coincidence. Let's examine the after crisis (red circled in the graph) development after Dotcom and Housing bubble burst.

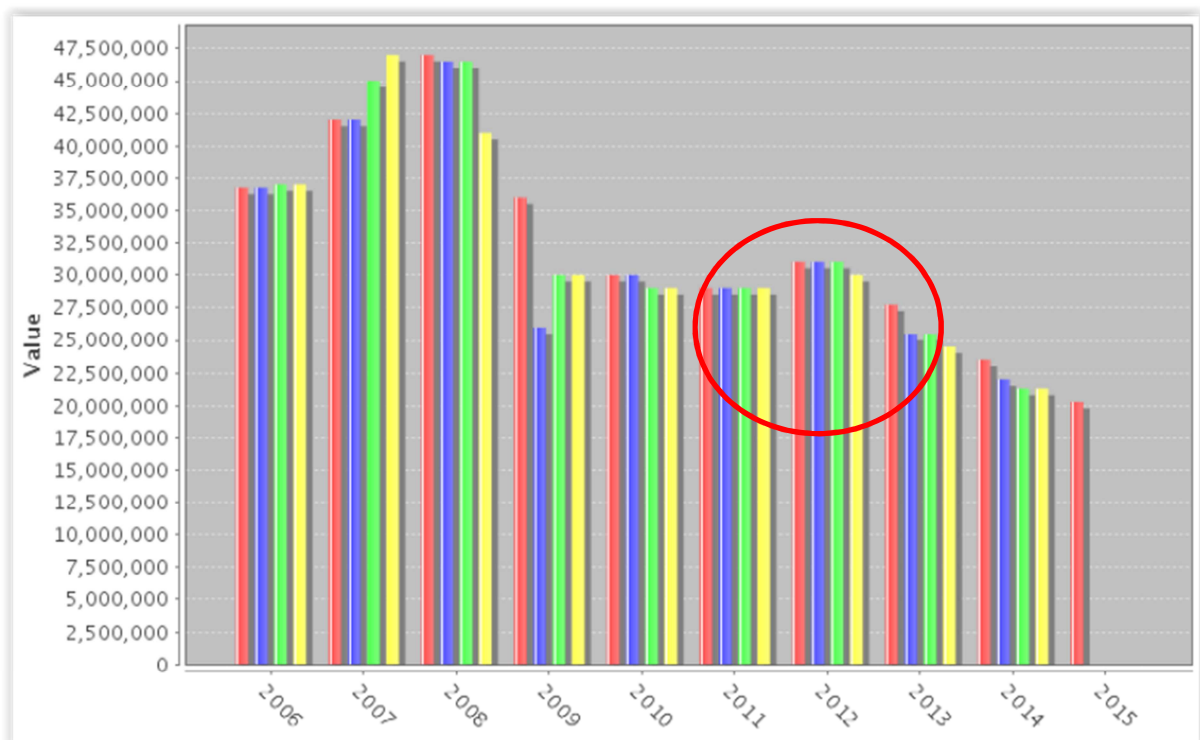


14. Cessna Citation Bravo (2001) (18)

This concrete graph is representing the value development of a Citation Bravo made in 2001, however the same principle is valid for most of the aircraft. Again, the older the airplane is, the smaller deflection will be visible. What is visible in the graph is a large and rapid fall with following permanent or (more usually) temporary slight increase. The reason for this behavior is that during an economic bubble the market is developing fictional balance on much higher level that is justifiable on the basis of real conditions. Players on the market then became simply used to that level and are marketing airplanes with respect to this reference line (roughly plotted by blue line on the graph above). Simply said, any price which is higher means that the asset is more expensive than the standard price and any price lower than it means cheaper than the standard one. The subsequent drop is not seen as a return to real uninflated price but as deviation from the existing price line. Practically anybody is than expecting a return to this line, hence buyers are keen to buy even for higher than slumped price and sellers are nor very happy to sell for such a low one. Then a force will form which raises the price. Afterwards, because there is not a justifiable and real reason for that movement, even that factor will become diminished and prices return to behave on the basis of real economic situation. However the fact, that people are expecting return to pre-crisis level may remain visible even in horizon of years, this nevertheless is not strong enough to cause significant market movement.

In any case it is not possible to question the fact that, to help the market recover from recession, people have to believe the situation will improve. As this does not have to be necessarily correct, many thematic media but even company outlooks tend to be very optimistic. This is true even if the actual situation is quiet far from being good. We may say that spreading incorrect information is dishonest and we will be absolutely correct, but spreading the opposite simply does not improve the situation while optimistic news might do so. This paragraph just says that to have realistic image in which condition the market really is, we have to analyze it more in depth before trusting all the news around.

Economic bubbles and the following post crisis development is of course not the only issue affecting aircraft price. In the recent past there was a small but visible imbalance around the year 2010 and 2011. However ostensibly there was not any worldwide event which could cause that.



15. Bombardier Global 5000 (2006) (18)

On the graph above, representing Bombardier Global 5000 made in 2006, it is very well visible. What actually is that movement and by what was it caused?

As in the same case like economic bubbles, even this event, or to be more exact, these events had economic nature. Very important role played rising government debt in the countries which are part of the world leading business areas, the biggest of them were the United States, we can mention also Spain, Greece, Italy or Ireland. As mentioned in the section about World business areas, a high level of national debt is not directly connected with power of national economy or strength of business

aviation market. But if not reduced by a rising gross domestic product it might work like a ticking bomb. If we simplify it, we can say that the higher the national debt is the closer a country is to inability to repay its obligations – to its default. During years 2011 and 2012 the above mentioned countries got quiet close to this situation. In case of the United States in 2011 there was a need to increase national debt-ceiling due to increasing debt value and reduced GDP after the Housing bubble burst. Due to negotiations difficulties between political parties this led to a risk of inability to repay part of its obligations which subsequently resulted in reducing their ratings from the highest AAA to AA+ on 8 August. This apparently insignificant event caused panic on the markets as it happened for the first time in the United States' history. An important reason for that was probably the fact that Credit rating agencies were highly criticized for its inability to correctly evaluate situation in 2008 where the country (US) with the highest rating fell to a deep financial crisis. A relatively minor event then led to reduced rating and over-evaluating the situation. The Administration of President Barack Obama tried to calm the situation afterwards by making a statement which paradoxically worsened the situation and led to another decrease of DJI by 200 points. The total decrease of DJI was 5,55 % which is the 6th largest one-day drop in history. The day in which this happened is known as Black Monday 2011.

Even though I have described one day in the US Stock market history, the situation was much more complex. While North America was struggling in recovery from the recession Europe was not in a much better situation. As in many cases which led to any crisis situation, one thing itself is not enough; there must be a combination of factors which connect together. So was the case of the European debt crisis. The main role played there increasing debt levels of European countries in the lead with Greece, weakened national economies after (or still during) the crisis, globalization of finance, easy credit conditions which encouraged high risk lending and approaches which counted with bail-out of the banks facing bankruptcy. It resulted in 2012 when 5 of 17 Eurozone countries had to seek help from other international resources.

One of the causes of these events as well as the issue due to which the downturn was worsened is pre-crisis set up of fiscal politics. Very often public spending, tax and social security systems were set up by the way which could not be compatible with post crisis situation. Hence we can say that the Eurozone debt crisis was at least partially only an unavoidable consequence of the antecedent bubble. It then practically led to readjustment of the national economic system to real (out-bubble) conditions.

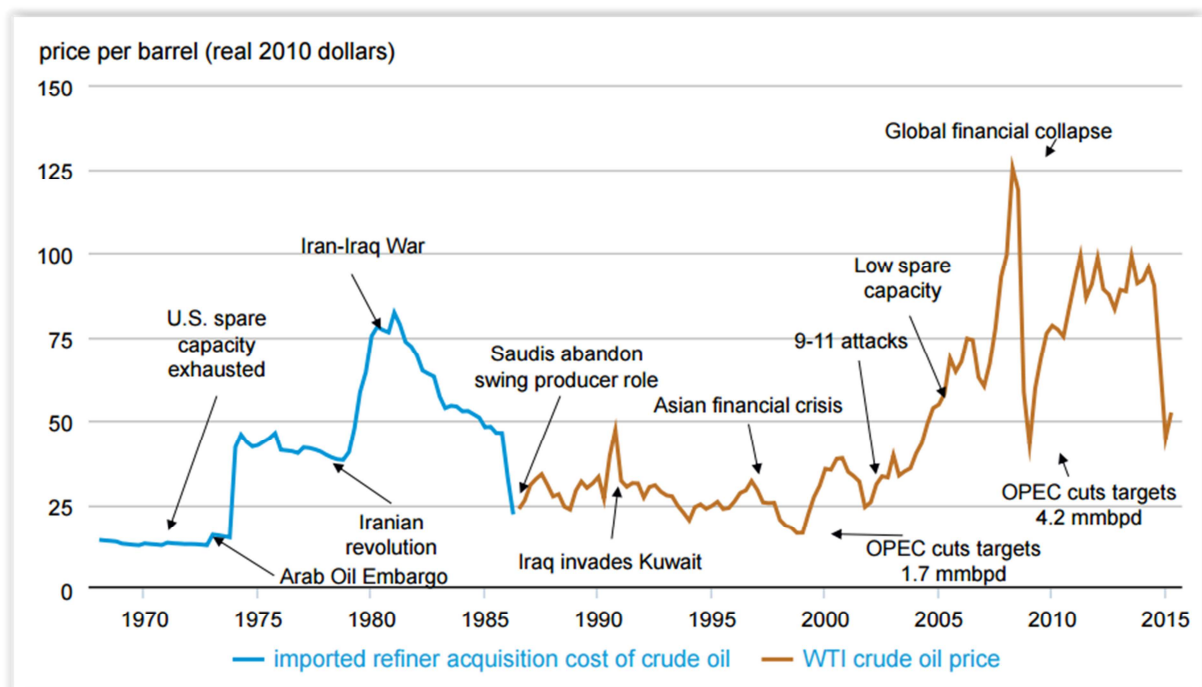
15.1.1. Contributing factors

15.1.1.1. Oil price

One of the contributing factors affecting price and volume of sales is oil price. We can generally say, that the higher the oil price is, the more difficult to sell aircraft is. However it is important to look at this fact more from a short term field of view and examine the change in trends, so it does not mean that in 2007 when oil prices were pretty high, the jet sales were struggling. What it does mean is that if economy is struggling, rising oil prices will not help the aviation industry. This was also the case of events during years 2010 till 2012 in Europe and the US, the high oil price itself will not cause large demand plummeting nor soaring but can act together against or with other factors.

As crude oil is largely drilled in the Middle East, which is politically quiet unstable territory, it is very often influenced by local issues. Very intensive influence can also have limits set by Organization of Petroleum Exporting Countries (OPEC), which shelters 12 oil exporting countries and together controls around 75% of world oil reserves.

Graph displayed lower shows crude oil price per barrel development in the past 45 years with marked geopolitical influencing events.



16. Crude oil price per barrel (19)

16.1.1.1. Inflation

When we examine prices, their behavior and development, we cannot take into consideration all the above mentioned factors and completely omit purely financial issues like inflation. It simply has to influence a price, the question is how.

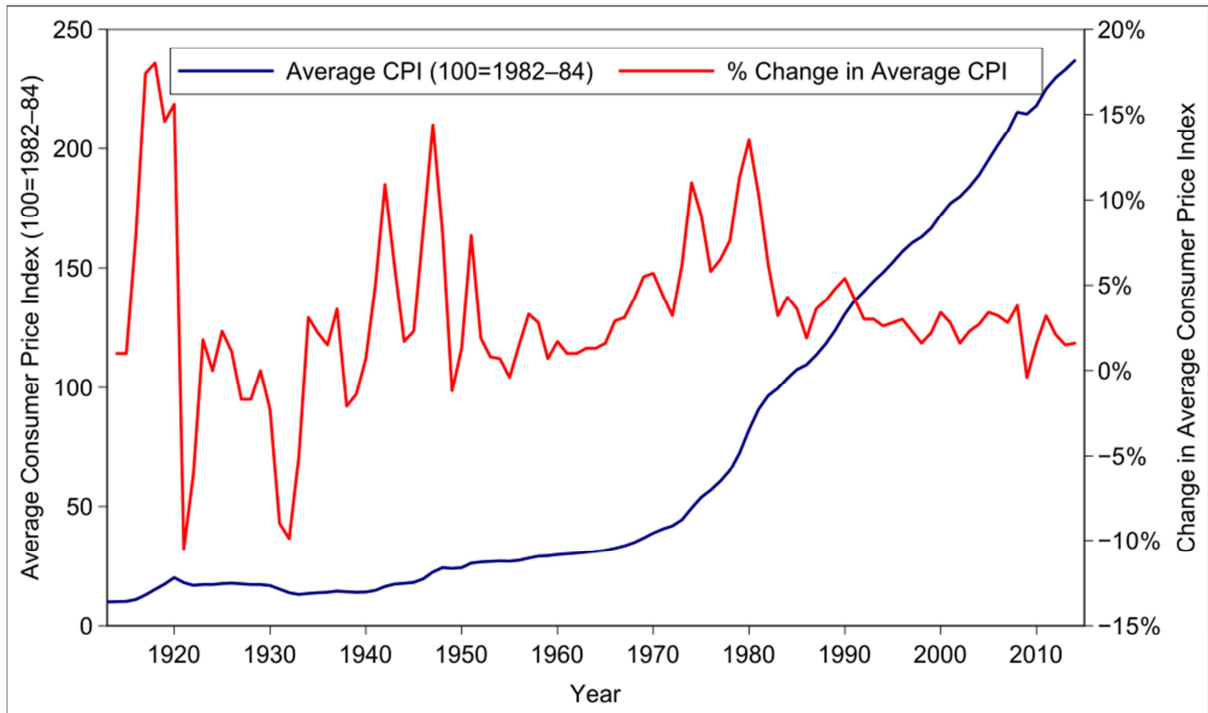
Firstly we should state that as aircraft are traded mostly in US dollars we will examine dollar's inflation, but the principle remains the same for all other currencies if practicable.

Theoretically when inflation is for example 5%, the purchasing power of dollar reduces by 5%. We simply have to have 1 dollar and 5 cents to buy an asset costing 1 dollar without inflation. However it is only the nominal value which changes by inflation, the real value remains the same, for the buyer as well as for the seller. As pricing is, simply said, only the matter of demand and supply and money is only a medium of exchange, we may come to hypothesis that its effect is in question. Under the effect of inflation the seller will expect a higher price of his aircraft but the buyer will be likely to pay it as the money are of less value for him. This is the ideal case how it should theoretically work, however it is covered by some kind of feeling that the reality is slightly different.

Taking into consideration economic inertia or simply delays and attenuations, unideal awareness of economic subjects about many issues and psychological factor we may say with a high level of certainty that the effect of inflation exists, but it is highly attenuated on the real market.

However we should take it into consideration if inflation or deflation reaches very high values, this is the case of strong excesses as we can see in the graphs below. It represents the average consumer price index (CPI) and its annual change in the United States.

United States Consumer Price Index 1913–2014



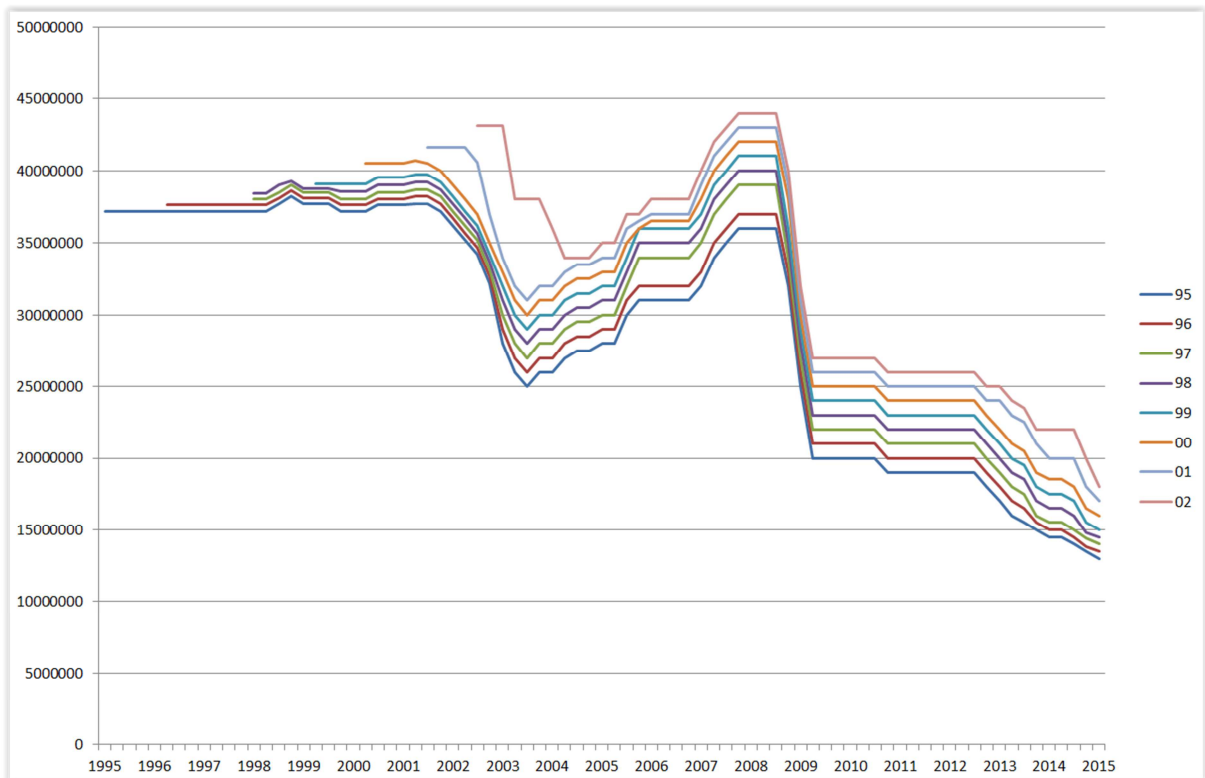
17. United States Consumer Price Index (20)

In recent years it is very close to values around zero, hence inflation effect is and probably will be in oncoming years as well, negligible.

17.1. Model price behavior

For assessing aircraft price and its estimating into the future we have to know as many information as possible. It is not sufficient to now only the current market situation and its prediction nor the theoretical price which follows exponential aging curve. We have to know how does the exact model behave and how does it react on outer factors. We have already mentioned the case of Embraer Legacy which follows a completely different curve from for example most of Gulfstream models. We would be entirely wrong if we tried to assess different model prices on the bases of a completely different model even under the same conditions. The spectrum of buyers is at least slightly different for every manufacturer, every model and certainly, for every aircraft class.

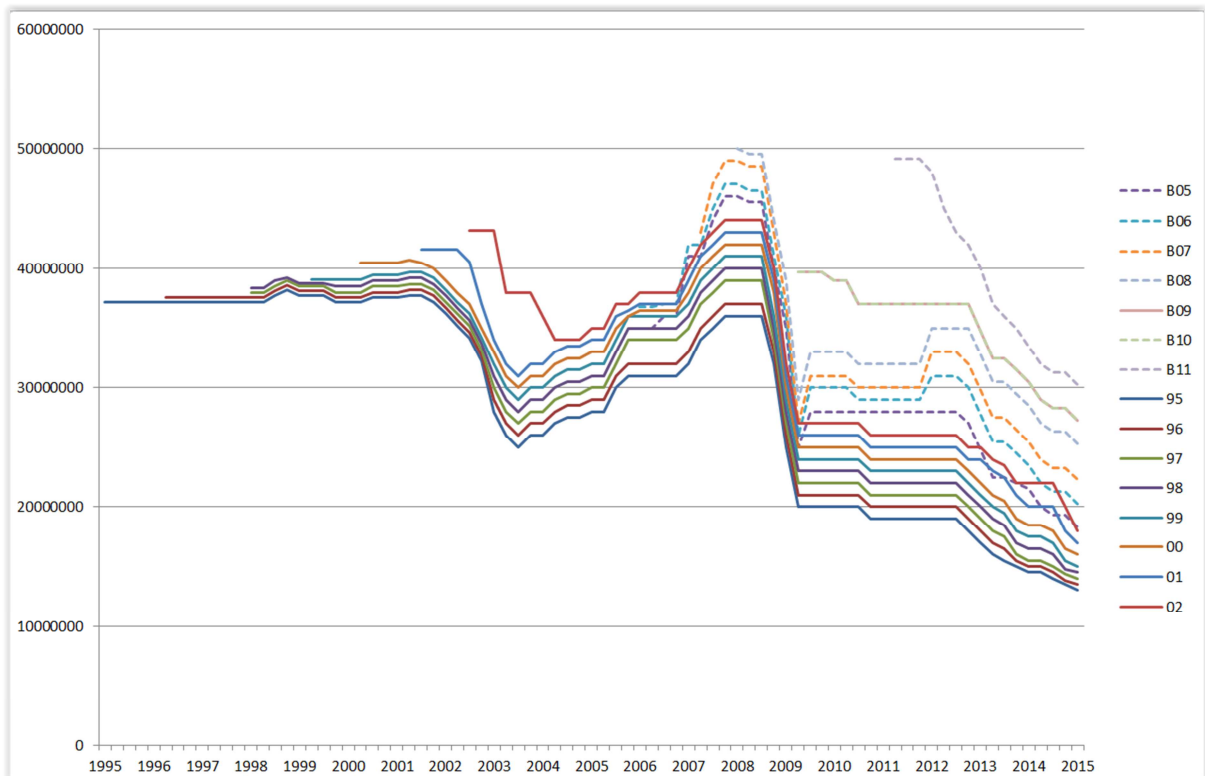
But can we compare the same model made in a completely different year? Does an aircraft behave in the same manner like the same model made e.g. 10 years later?



18. Gulfstream GV 1995 - 2002

The above listed graph shows the price of models of Gulfstream V made from the year 1995 till 2002. With the exception of the last model year, which was introduced practically during the recession, we can see a strong correlation between models with different YOP.

We can compare two different models of the same class, in this example both of them are long range jets, the first is, as listed above, Gulfstream GV and the second Bombardier Global 5000 (dashed lines).



19. GV + Global 5000

We can see that the correlation is far from perfect, but the market still of course corresponds to major events. Also the correlation between different Globals is very well visible. The same is true for the majority of different aircraft types made in the last decades. Hence we can say that same model with different years of production will on the market (in terms of trends) behave like the other one. This should not be changed with aircraft attractiveness for a buyer. When a younger aircraft is increasing in price, the older one will probably do the same, but this might not change the fact that aging aircraft could be quiet challenging to sell due to all other factors.

19.1. Conclusion

In this section I have mentioned probably the most influential factors which move the price of business jets to often unimaginable levels. Certainly we can never be absolutely sure whether and how any of them will act in the future, but without their knowledge we will never succeed in their prediction. As it is incomparably easier to assess past events than to foretell future ones, it is grossly insufficient to write an exhausting overview within a few lines. But still there is a way.

Like the nature all around in the laws of physics, chemistry or mathematics, even the market tends to be in balance. It attempts to exclude all the outbalancing forces and behave like it should do from basic principles. Any excesses will sooner or later be diminished to return to the status of balance. We may very much believe that in the field of the aircraft market, this balanced status is formed by an aging curve. Should we find this, we may be able to find the excesses. Should we find the excesses, we may be able to find their essence. Knowing its present and past, we might be led to its predict its future. The major complication is that economic bubbles play a leading part in these excesses, which are very easily identifiable retrospectively but it is more than challenging to predict or even identify them in advance before they burst. However, there are even periods when these do not play their role. At that time, other factors become visible. A negative effect on the aircraft price is the introduction of a new aircraft type which is going to be its successor or a new flagship. Even if this fact might be barely visible in the graphs, it is there and we cannot exclude it from our decision. It will be more practicable to sell an aircraft before a new type comes on the market and even if it does not we may expect a decrease in value after the 7th year succeeding the aircraft's introduction on the market and another definite drop when reaching the 15th year after that time. The expectation of a price rise in case of airplanes older than fifteen years should not be high at all. Another important question we have to ask ourselves is, in which state is the market? What are realistic predictions? We do not have to know the current and exact state, but we should not ignore basic and well known facts. Generally it is not a very good idea to sell an aircraft during the time when everyone is talking about recession and with that connected price drops and oversupply. We may expect a price rise after market stabilization generally years after the recession, when demand meets supply and the market finds its balance again. On the other hand, in the opposite extreme, how do we know not to sell just before rapid price increase? Although we may be quite precise in the previous question, answering this one is more a matter of speculation than logical assessment. This however does not mean it is impossible, especially using complex analysis and an experience-based estimate which unfortunately could not be part of this work. However, exploration of financial and economic indicators can give us an idea about direction of the economy whose output then directly affects general aviation. So do other contributing factors. We cannot neglect the movement of oil price, which makes operation costs of business aircraft higher or lower respectively. Very often it is just the operating cost which plays an important role in aircraft acquisition or sale. Finally we cannot forget inflation. Even though it does not have to have an important effect, it can reassure us regarding our assumption about market conditions, especially in eras of economic instability.

Taking all the above-mentioned issues related to the current situation in mid-2015 we may very much believe that the situation in the market is improving and that it will do so more rapidly in the

following years. In the past there were several recessions. Recovery from most of them took around 2-3 years, as the last one was deeper and probably the deepest in the past 70 years, the resetting of world economies and stabilization took practically more than twice as long. However, with the situation in the world markets, even those heavily hit, we may be pretty much sure that without heavy political issues, the situation will turn into an economic rise fairly soon. The inflation rate and crude oil price support this statement as well as economic indexes, which record all-time highs these days. Hence taking all these facts into consideration, this time might be the time from which we can expect prices of certain jets to grow and more of them at least to stagnate. This should be true especially for brand new models still in production and models made after circa 2008.

20. Summary

At the beginning, we asked ourselves questions – can the price of a business jet rise during time? If you own an aircraft, does it make sense to wait before its sale with any expectation of a price rise or stagnation even though it is still getting older and hence less attractive on the market? Can an airplane be more expensive in a few years' time when it gets older than it is now? Although all of these questions may seem at first sight absurd, now we know that the answers are positive. The prices of business aircraft can not only stagnate or slightly rise in time, they can change to positive values by tens of percent in a very few years. Another goal was to find out how this can happen, why and when. The solution is much complex and quite challenging to discover. Every type of aircraft is a little bit different in terms of price change. Light jets behave in one manner, large cabin jets in another, and for the sake of complexity, comparable types of different manufacturers also behave differently, as well as various models of the same OEM belonging to an identical class. In other words there is no aircraft type on the market which behaves like any other one. However there are aspects which connect them all together. These are the same trends in certain time periods that greatly resemble that of economic bubbles. As trading bubbles may be the main reason for aircraft prices soaring, they will never be the only reason. There has to be something else, many more factors affecting the price. They have to be here now, they must have been there in the past and they will have to be there in the future which is our concern. But what exactly is the future? There are factors developing in time possibly but not necessarily affecting each other. If we were able to identify and examine them one after the other in the known past and present, then predicting them separately and joining them back together would give us a complex new situation. This situation will be the future. By “factorizing” a known situation we might be able to predict oncoming events more accurately. These factors are in the sphere of business jets price development, aircraft age, the market situation and new types development. I have intentionally not mentioned political factors,

inflation and oil prices, the prediction of which is almost unrealistic, but they can be taken as contributing factors for accurate assessment of the present and with that connected market situation.

Further analyzing model behavior, we may say that it practically does not matter in which exact year the model was built, but it will behave similarly to the same model made in any other year, supposing no great changes have been made. However as the aircraft gets older it becomes less sensitive to excess-making factors and follows more and more accurately the exponential aging curve. Thence there shall exist specific time, from which we cannot expect any significant positive change in price. This varies from the 7th year for the most rapid changes and ends at circa 20 years after the aircraft's first flight for most of the other price inflations.

From the historic point of view, it took only a while for business aviation to become a global industry. Connected to this fact are many local specifics, hence the age and other above-mentioned factors are not the only ones affecting aircraft liquidity on the market. It may mostly depend on where in the world we are selling or buying an airplane. While the United States followed by Europe might be a wide market strong enough not only for large jets but also for very light and small jets, it might be different for Asian and Middle East areas. Due to local and historical specifics these are markets for large top-of-the-line flagships. Having these aspects in mind, we can succeed on the market with higher than expected levels.

Finally we can say that it is possible to earn money solely by owning an aircraft, however not considering price stagnation only, this seems to be correct on a larger scale only for the times during active economic bubbles. But if we can expect a strong positive trend in aircraft pricing only during the bubbles, can it work the other way around? Can we identify the bubble by stably increasing aircraft trade in values?

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