

Preliminary Draft

**A Review of Iranian Aviation Industry:
Victim of Sanctions or Creation of Mismanagement?**

By:

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Abstract

Motivated by the present conditions of Iranian aviation industry this paper studies the history of Iranian aviation in the past three decades and its evolution from a public franchise to a mixed industry encompassing private, semi-private and public airlines. Exploring its different aspects, it demonstrates how commercial aviation has become accessible in many parts of country through ambitious projects to construct airports in many provinces and regions. It also shows that how increasing demand for domestic air travels has made commercial aviation industry self-reliant and in no need to compete in international markets. It exhibits that how government interferes in the industry's daily activities through pricing policies, fuel subsidies and granting licenses to fly different routes.

Keyword: Iran, Aviation Industry, Commercial Airlines

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DRAFT

1. Introduction

In 12 months that elapsed from March 2009 to March 2010 Iranian aviation industry experienced five accidents and three different heads of civil aviation. 186 people, all civilians, were killed in these crashes, with four aircrafts becoming unserviceable. Iranian public opinion of aviation safety and Russian airplanes dropped to such a low point that forced civil aviation authorities banned any new acquisition of Russian manufactured aircraft. They even vowed that the remaining aircraft would leave Iran's skies. The weeks following the incidents witnessed an outburst of opinions and analysis as well. The usual culprits according to Iranian media were "profit seeking executives" and "aviation dealers". Iranian Civil Aviation Organization (IR-CAO) official position was what it has been for the last three decades. It maintained that none of the airplanes involved in the accidents had any technical issue. It also announced that the airplanes had passed IR-CAO inspections and all were in good conditions². These procedures were never questioned or investigated. The often cited cause of incident has been "pilot's error". However there have been 10 air crashes in Iran involving Russian-made commercial aircraft since year 2000, nine incidents had fatalities (see Table 1).

For their part Iranian aviation executive blame the sanctions. Iranian aviation industry is facing multiple series of sanctions currently. Originally imposed by the United States these sanctions have denied Iranian airliners access to modern technology, recently manufactured aircraft, maintenance for their fleet and other services. However for the most part of 1990's such transactions were possible through third country. Recent Security Council resolutions have put a virtual end to these dealing and have restricted Iranian airliners access to parts significantly difficult³. Indeed this has increased the average age of operational aircraft in Iran. Iran Air, country's flag carrier airline, fleet average age is 22.8 years according to IR-CAO sources. However Iranian authorities usually downplay the role of sanctions. In December 2009 then the head of IR-CAO, Mr. Nakhjavani, told Iranian medial "The U.S. embargo on the import of planes to Iran has been the cause of no plane crash in Iran by now since all planes start their flight based on standard procedures" he reminded reporters that in these procedures would prevent faulty planes from flying.⁴ This has not stopped Islamic Republic of Iran (IRI) government from complaining to international organizations about the safety deficiencies caused by these sanctions.⁵

While the role of sanctions and inferior technology is becoming prominent in public media, some observers highlight the part played by regulators and mismanagement. According to them the fault rests mainly with politically driven regulators who fail to do their job. These observers ask how it is possible the main cause of close to thirty aviation incidents to be "pilot's error". When in August 2010 a Fokker 100 airplane ran out of runway in Tabriz International Airport and fall into a trench, many started to question IR-CAO regulators and the airport authorities' performance.⁶ Only six month earlier Taban Airlines directors had officially complained to the transportation committee of Iran's parliament about

² Mr. Ilkhani's interview

³ Author's interviews with pilots and former executives of several Iranian airlines.

⁴ "Official plays down U.S. sanctions on Iran's aviation industry", Tehran Times, December 20th, 2009.

⁵ International Civil Aviation Organization (ICAO), Economic Commission, Working Paper A36-WP/275

⁶ "Aseman Airplane Went off Runway" BBC Persian, August 27th, 2010.

the management of Mashhad International Airport and IR-CAO 's leadership and accused them of incompetence.⁷

Despite the ongoing public debate the question still remains that what is the true cause of the present perilous conditions of Iranian commercial aviation industry; Sanctions, Russian aircraft or mismanagement? These questions have motivated the present studies.

While a comprehensive study of Iranian airlines has yet to be done, aviation industry and commercial airlines have a place of prominence in the existing literature. Many authors have investigated different aspects of the industry from operational challenges to the mergers and pricing policies. These studies are divided into two major categories; one group is dedicated to the industry itself, its internal dynamic and its operations. Another group of researchers explore its economic aspects and implications. Most recently a growing number of authors become interested in aviation industry role in economic development and its contribution to sustainable growth.

From the first group of authors we should mention Spence (1975 and 1976), Mayer and Sinai (2003a and 2003b), Mazzeo (2003) and Rupp, Ownes, and Plumly (2003) who study the relationship between service quality and competition in airline markets. Morrison and Winston (1989) estimate the airline demand, Kostiuk, Gaier, and Long (2000) study the costs of air traffic control systems, airlines and airports. Suzuki (2000) shows that market shares are positively correlated with airlines' performance. Januszewski (2004) estimates the price responses to the flight delays differ in competitive and non-competitive markets. He shows that the prices fall sharply in competitive markets but not in non-competitive markets.

Numerous studies are conducted on implications of competition, pricing, strategic behavior and other economic concepts in aviation. We only can name a few here. Zimmerman and Borenstein (1988) study demand for airlines after their accidents and find little indication of a change in demand in response to crashes. Borenstein (1989 & 1992) investigate the relationship between hubs and market dominance as well as the evolution of airline industry in the United States. Borenstein and Rose (1994) address the question of pricing. More recently authors such as Goolsbee and Syverson (2008) study how airlines respond to the threat of entry.

A growing body of literature is focusing on the role of aviation industry and commercial airlines in developing urban areas and economic growth and their relationship with employment. Nunn and Schoedel (1995) find out that cities often pursue airport-based projects that promise employment gains and multiplier impacts on business and fiscal development. They noted that airline maintenance operations centers (MOCs) offer these benefits but frequently require massive capital investment by cities and commercial airlines. Brueckner (2003) provides new evidence on the link between airline traffic and employment in US metropolitan areas. He confirms the common view that good airline service is an important factor in urban economic development and increases business opportunities for local industries. Micco and Serebrisky (2004) confirm that transport costs still can be considered as

⁷ "IR-CAO Chief and Taban CEO Clashed in Majlis" Khabar, March 25, 2010.

barriers to trade as liberalization continues to reduce artificial barriers to trade. They suggest that in order to eliminate this barriers countries need to adopt policies to “get closer” to global markets. Their empirical results demonstrate how improving air transportation infra structure indeed reduces transportation costs and facilitates trade between countries. Green (2007) finds out that passenger activity is a powerful predictor of growth in a metropolitan area while cargo activity is not.

Given the success of airlines such as Emirates and Qatar Airlines in recent years authors study the aviation market in Middle East in general and in Iran in particular. Feiler and Goodovitch (1994) study the challenges faced by the management of the national airlines in the Middle East. They suggest that the liberalization of the European civil aviation industry embody risks but also enormous opportunities for Middle Eastern airlines. The structural shift in international aviation industry improves the long-term prospects for Middle East air transport significantly. Adler and Hashai (2005) estimate potential inter-regional passenger flows for air transport in the Middle East under open skies polices, once deregulation agreements are reached between neighboring countries. They follow the example of European markets. They include population size, gross domestic product (GDP) per capita, absolute difference in GDP per capita between two countries, great circle distance and membership of the European Union and World Trade Organization. After their estimation, surprisingly, they suggest that under conditions of peace Cairo and Tehran consistently achieve hub status, along with Istanbul and Riyadh. Carnery and Farshahi (2005) narrate the embedding process of the emergent international aviation regime, ICAO and IATA, in post-World War II Iran. They characterize the rise and decline of these regimes as a double process of institutionalization and de-institutionalization, and identify political and technical factors that drive institutional change. Dehbashi and Nahavandi (2007) study using internet as a new channel for ticket reservation in Iran and Jenatabadi and Ismail (2009) study the load factor as for six major Iranian airlines as an index of their performance. They suggest that companies should increase their investment in computerized reservation systems, improve on their operation planning, change in management style and have more control in managing their airlines. The government of Iran should also maintain or continue giving subsidy in order to improve load factor. They do not address either the issue of pricing or market entry.

The present study is organized in six sections. The second section summarizes the present conditions of Iranian aviation industry, the level of government interferences and the challenges Iranian airlines face. It is followed with a review of data and the fourth section tests for the seasonality and finds that demand for airline varies across the season. The fifth section summarizes the findings and conclusions.

Table 1. Iranian Airlines Incidents⁸

	Date	Airline	Aircraft	Location	Fatalities
1	December 25, 1952	Iran Air	Douglas DC-3	Tehran, Iran	27
2	January 21, 1980	Iran Air	Boeing 727-86	Tehran, Iran	128
3	July 3, 1988	Iran Air	Airbus A300B2	Persian Gulf	290
4	April 26, 1992	Iran Air Tours	Fokker F-27 Friendship 400M	Saveh, Iran	39
5	February 8, 1993	Iran Air Tours	Tupolev Tu-154	Tehran, Iran	131
		IRIAF ⁹	Sukhoi Su-24		
6	October, 1994	Aseman Airlines	Fokker F-28	Natanz, Iran	66
7	March 17, 1994	IRIAF	C-130 Hercules	Ballica, Azerbaijan	32
8	March 14, 1997	Iranian Military		Mashad, Iran	80
9	February 2, 2000	IRIAF	C-130 Hercules	Tehran, Iran	6
10	May 18, 2001	Faraz Qeshm Airlines	Yakovlev Yak-40	Tehran, Iran	29
11	February 12, 2002	Iran Air Tours	Tupolev Tu-154	Khorramabad, Iran	118
12	December 23, 2002	HESA ¹⁰	Iran-140	Isfahan, Iran	45
13	February 19, 2003	IRGC ¹¹	Ilyushin Il-76	Kerman, Iran	302
14	February 10, 2004	Kish Air	Fokker-50	Sharjah, UAE	43
15	April 20, 2005	SAHA Air Lines	Boeing 707-300	Tehran, Iran	3
16	December 6, 2005	IRIAF	C-130E Hercules	Tehran, Iran	128
17	January 9, 2006	IRGC	Falcon	Orumieh, Iran	11
18	September 1, 2006	Iran Air Tours	Tupolev Tu-154M	Mashad, Iran	28
19	November 27, 2006	Iranian Military	Antonov An-74	Tehran, Iran	36
20	January 2, 2008	Iran Air	Fokker 100	Tehran, Iran	0
21	August 24, 2008	Iran Aseman Airlines	Boeing 737	Bishkek, Kyrgyzstan	68
22	February 15, 2009	HESA	Iran-140	Isfahan, Iran	5
23	July 15, 2009	Caspian Airlines	Tupolev Tu-154	Qazvin, Iran	168
24	July 24, 2009	Aria Air Flight	Ilyushin IL-62M	Mashhad, Iran	16
25	January 24, 2010	Taban Air	Tupolev TU-154M	Mashad, Iran	0
26	August 26, 2010	Aseman Airlines	Fokker 100	Tabriz, Iran	0

⁸ Gathered based on information available in media, ICAO websites and IR-CAO authorities interviews.

⁹ Islamic Republic of Iran Air Force (IRIAF)

¹⁰ Iran Aircraft Manufacturing Industrial Company (HESA)

¹¹ Islamic Revolutionary Guard Corps

2. Data

There is no single organized data bank for Iranian aviation industry. IR-CAO publishes an annual report called "Air Transportation Statistics Annual Report". This annual report includes the monthly statistics for air travel passengers, air cargo and air mail for Iran. Data includes monthly observation of passenger, cargo, mail in different airports across the country. The data is often reported at airport and airline level and aggregated nationwide. Unfortunately the format of these annual reports has not been consistent.

For 1979-1984 IR-CAO reports included monthly data at airport level on passengers, cargo and airmail, however they lack definitions and in many places are not consistent. IR-CAO also reported international airlines activities in Iran. Since often the operator was either Iran Air or Aseman Airlines, the monthly data for the number of passengers and cargo carried by these two airlines was reported as well for a number of the years and not always. IR-CAO annual reports also include summary tables on performance, growth and distribution of passengers and cargo across Iranian airlines and airports.

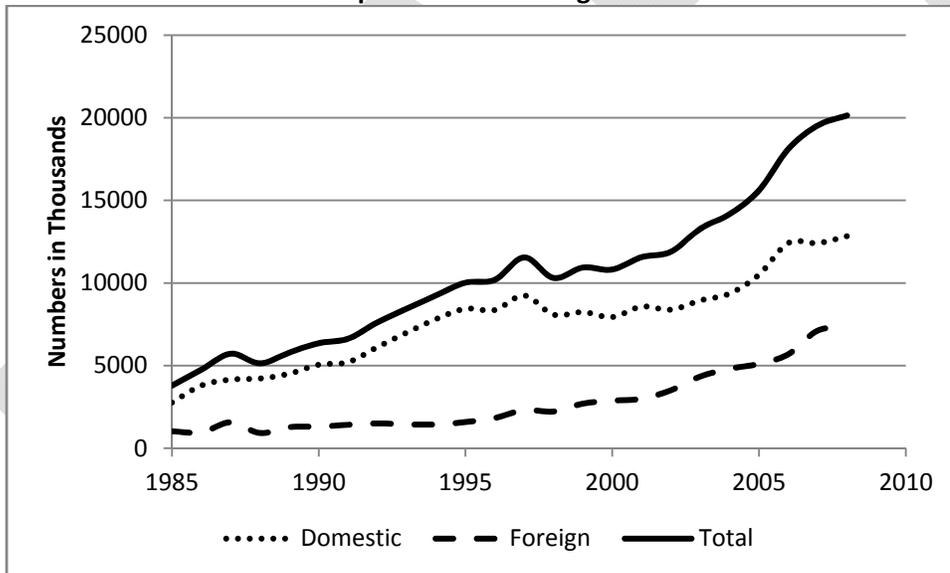
As the industry grew the reports began to be more elaborate. The data for private airlines appear in these reports in 1990. Since then the annual reports began to include the monthly data for passenger and cargo at airline level as well as airlines' rank and market share. Since 2000 a separate part has been added on the performance of domestic airlines. Its sections include domestic airlines performance at domestic airports, domestic airlines performance at international routes and international airlines performance at domestic airports. This sector includes passenger and cargo data at airline-airport and airline-route level. The data at airline-airport and airline-route level is usually available annually; there are also observations at airline-month level. These includes all active operational airlines in Iran, however it does not include Aseman Airlines reports for a number of years for reasons unknown to the authors. The data reports observations on year, month, airline, airport, number of incoming passengers, number of outgoing passengers, volume of incoming cargo in kilogram, volume of outgoing cargo in kilogram, volume of incoming mail in kilogram, volume of outgoing mail in kilogram, number of incoming flights and number of outgoing flights. Most recently the reports include detailed information on international airlines activities at Iranian airports, including number of departure and arrival flights, number of passengers, cargo tonnage and mail.

It must be noted that IR-CAO collects the necessary data using ICAO reports airlines have to file with its offices. These reports are filed according to ICAO calendar using months of January through December. However IR-CAO annual reports are according to Iranian calendar in which a year runs from March 21st to March 20th of the next year. Recent annual reports actually cover from the first day of April to the end of March next year. Thus it leaves out the first ten days of Iranian year for every year and includes the first ten days of the next Iranian year. For example data for year 1387 does not include the first ten days of Farvardin, the first month of Iranian calendar, but it includes the first ten days of year 1388. This omission is significant since the first two weeks of Iranian year are usually New Year vacations. One way to adjust for this distortion is to transfer data back to Gregorian calendar; however we do not have access to Iranian airlines' ICAO monthly data presently.

As mentioned earlier the data is not available in electronic format, although reports are available in the pdf or doc formats for the years after 2004 and in hardcopies for years before that. We have collected most of the reports and scanned them into electronic pdfs. The annual data then was into Microsoft Excel files. We have constructed the panel data for years 1997, 1998, 1999, 2000 and 2001 at airline-departure airport-month level by scanning the hardcopies. We also have extracted the data for years 2001 to 2008 and are in process of transferring to panel data.

Monthly tables are constructed for three major Iranian airports: Mehrabad (Tehran), Mashhad and Kish to include total number of passengers, outgoing and incoming together as well as the volume of cargo. These three airports constitute 57% of total passenger traffic in Iran for the period of 2001 to 2008. Mehrabad is Tehran’s main domestic airport and was considered Iran’s main international gateway until 2007. Mashhad is the home of Imam Reza, a holy Imam for Shi’ees and many other Muslims and thus a favorite destination for pilgrimage. Kish Island is Iran’s major holiday resorts and the most popular free trade zone. Across these airports we test for the seasonality of air travel demand to see if the official fixed pricing approach would be validated.

Graph 1. Total Passenger Air Travels 1985-2008



3. Past and the Present

In an economy known for its volatility it is difficult to single out one industry as the most volatile industry. Still Iranian aviation industry is a nominee for the most volatile industry award. Both its history and its dynamics merit this nomination. During the past year this industry has been subjected to many ups and down. In post war era it experienced a large increase in domestic air travels due to the ending of hostilities. Then it grew constants since then. The total number of domestic air travel passengers rises from 4.2 million in 1988 to 12.8 million in 2008, demonstrating a threefold increase. However the path was anything but eventless. The initial growth rate in demand for air travel fall down to less than 10

percent in late 1980's and bounces back in early 1990's. Iranian commercial aviation experienced a decline of 13 percent from 1997 to 1998, where the total number of air travel passengers falls down from 9.2 million in 1997 to 8 million in 1998. The number of air travel passengers did not reach 1997 peak until 2005 (See Graph 1. & Graph 2.). This section offers a brief summary of historical events surrounding Iranian commercial aviation since its beginning.

3.1. Beginning

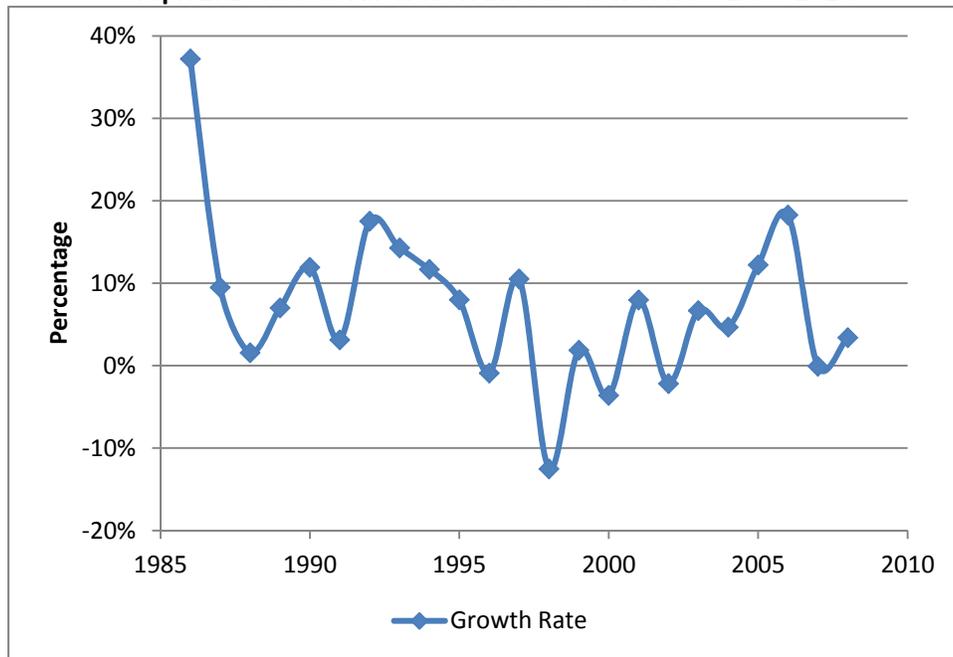
Revolutions and wars have come and gone, and yet it can be said the institution of aviation has experienced little structural change since its beginning in Iran. Since its very beginning Iranian aviation has been divided into two separate spheres: military and civil. Like many other modern and industrial establishments Iranian aviation can be rooted back to post WWI era and Reza Shah Pahlavi modernization efforts. In 1922 Iranian government purchased its very first aircraft from Germany¹². By 1925 Iranian Air Force was operational. In the meantime German operated aircraft flew airmail and cargo missions between different Iranian cities. 1930's witnessed further development. A flight academy and a technical school were established. In 1938 the first Iranian aircraft assembly line came into existence in the form of Shahbaz factories, where biplanes were manufactured. It must be noted that both training and manufacturing began as military entities, thus both sections were under the ultimate control of military commander in chief and rarely subject to the civilian government.

Iran's first flag carrier became operational in 1946, when Iranian Airways was established by a group of private businessmen using a fleet of American made Douglas DC-3's, mostly WWII decommissioned military aircraft. Like many other private endeavors, such as power stations and utilities, after its initial success government took over the enterprise. In 1962 Iranian Airways merged with Persian Air Service, another private firm to form Iran Air as a public entity. In 1964 Iran Air became a member of IATA. In 1965 it received its first jet aircraft, a Boeing 707. During 1970's further deliveries of Boeing 737, 727 and 747 followed with an order for Airbus 300. In 1973 Iran Air established Iran Airtour as its low cost subsidiary.

By 1978 it was serving 35 international destinations and was hoping to become the region's primary transit airline, a plan successfully pursued by Emirates later. The air force commanders were appointed by commander in chief, then Mohammad Reza Shah Pahlavi, while the chief executives of Iran Air were appointed through the ministry of transportation. In the meantime Iran ministry of defense was constructing industrial plants to support air force fleet. There is little evidence that either Iran Air or civil aviation played any significant role in ministry of defense plans. There also were a few private airlines in existence who were serving domestic routes mainly.

¹² This was a Junkers F-13 airplane.

Graph 2. Domestic Air Travel Annual Growth Rate 1985-2010



3.2. Revolution and New Realities

As history shows both civilian and military aviation segments had notable parts in Islamic Revolution of 1979. Iran Air personnel went on strike in winter of 1979 and Iranian air force dissatisfied technicians were the first in Iran's military establishment to embrace the revolutionary fervor. Ironically both sectors were the very first to experience the realities of Iran's new international situation. United States imposed an embargo on exporting airplanes and parts to Iran early on, which has been intensifying during the past three decades in both implementation and coverage of items and aircraft. According to the United States, manufacturers or other United States firms cannot sell and export aircraft, engines and spare parts, CNS and security equipment etc. to Iranian air carriers or Iranian companies or government agencies, whether the equipment is new or used. Nor can firms in Europe, the Middle East and other countries worldwide re-sell (re-export) most United States-origin equipment to Iranian air carriers, even if they owned the equipment for years. Firms in the United States cannot sell parts to firms in Europe if they know that those parts will be resold to Iranian air carriers. Firms (including airlines in Europe), which provide maintenance for Iranian air carriers cannot provide such maintenance if it involves the installation or replacement of United States parts.

In aftermath of revolution all Iranian international airports except for Mehrabad lost their international status. Mehrabad became Iran's only international gateway. This decision might have rooted in revolutionary government's need to control all borders closely. A nationalization of all airlines and private flying clubs took place. Like its predecessors in 1962, Islamic Republic established a new

public airline by merging all existing private ones called Aseman Airlines¹³. Iran Air continued its operation on a reduced scale after gaps because of revolution and later on war. In the meantime Aseman Airlines began serving domestic routes within Iran. War with Iraq as well as several hijacking attempts by the elements of MKO during 1980's made the flight security a matter of national security. This amplified government and military presence in the industry. A special branch of Islamic Revolution Guards (IRGC) was established to protect and to control country's airports called Airports IRGC. The hijacking attempts also prompted the authorities to form flight security teams from IRGC and other revolutionary military organizations.

By the end of 1980's Iranian aviation maintained its dual military-civilian nature. However the role of government, or political establishment, in controlling it had reached new significance. It was a completely public run industry with no private player of any significance or size. The US imposed sanctions had prompted both Iran Air and Aseman Airlines to seek and purchase European manufactured aircraft such as Airbus, Fokker 50 and 100 and ATR 72.

3.3. Expansion and Private Airlines

The late 1980's and early 1990's marked the expansion and transformation of commercial aviation in Iran. First a semi-private sector came into existence. As part of its post war reconstruction program Iranian government embarked on an ambitious expansion of domestic airports network. Both Iran Air and Aseman found it difficult to serve all the new airports and new routes. On the other hand the success of some of government plans depended on the availability of air transportation. For example development plans included establishing free trade zones in Kish Island and Qeshm Island in Persian Gulf and Chabahar port on Oman Sea. Hakimian (2009) suggests that Iranian government used these free trade zones for experimenting with liberalization policies such as relaxing the labor code. This seems to be the case for the Iranian commercial aviation industry. The administrations of these free trade zones argued that having an aviation branch, or an airline of their own, is a necessity for their success. This was particularly true in the case of Kish Free Trade Zone, the first of free trade zones to be established. It was designed originally as a domestic hub for tourism and a gateway for imported products and goods for domestic households. In 1988 Kish Free Zone Organization (KFZO) established Kish Air to operate both passenger and cargo from and to Kish Island. In the meantime Iranian air force reactivated SAHA airlines to use its transport aircraft such as Boeing 707 and 747¹⁴ in commercial activities. In the same year Safiran Airlines started its cargo operations out of Mehrabad airport using leased and chartered airplanes. More entries happened in early 1990's. In 1991 Mahan Airlines became the first private

¹³ The notable exception to this merge was the aviation branch of National Iran Oil Company, N.I.O.C., known today as Naft Air.

¹⁴ SAHA had been founded before revolution as an air service for the military personnel and their families but never had been intended as a major player in commercial aviation. It is one of the last airlines to operate a Boeing 707.

airline¹⁵ in post revolutionary Iran. In 1993 Caspian Airlines began its flights. These efforts resulted in an unprecedented increase in domestic air travels in Iran. By 1995 total number of domestic air passengers doubles from 4.2 million in 1988 to 8.4 million. The total number of foreign air travel passengers increases also from 918'000 passengers to 1.6 million in 1995 demonstrating a 72% increase, although foreign air travels share of total air travels shrink to 16% from a previous 18%.

The changes were not limited to new airlines. In 1988 Iranian government established Iranian Airports Holding Company (IAHC). To this new entity the government transformed all of administrative and the executive powers and administrative duties of IR-CAO in regards to the airports. IAHC became responsible for the provision of airport services, aeronautical services, and airport design services and construction services. It became part of department of transportation, but run and managed as indicated by the code for public firms. In the same period several Iranian airports received international status. The most notable ones are Mashhad, Shiraz, Isfahan, Kish and Tabriz. In 2008 there were international to and from no less than 26 airports in Iran¹⁶.

Iranian authorities also did not give up on the dream of becoming the transit hub for cargo and passengers operations in the region. Construction works were resumed at Imam Khomeini International Airport (IKA), in southwest of Tehran. IKA was opened in May 2004 and since October 2007 all international flights are directed to this airport. Iran's Ministry of Information & Communications Technology (ICT)¹⁷ also went ahead with its plan to construct an international airport for airmail and cargo operations. In 1991 it opened Payam Airport, 55 km west of Tehran. Later in 1992 Payam became an international airport. In 1997 Payam Air, Payam Aviation Services Company, was established to operate airmail and cargo flights out of Payam Airport. Payam Airport area became a free economic zone in 2001 to facilitate its cargo activity and operations.

The expansion efforts also included plans to manufacture airplanes domestically. Having self sufficiency in mind and determined to somehow by pass sanctions Iranian government announced in late 1990's its plan to construct an assembly line to manufacture a version of Antonov AN-140 under license from Ukraine¹⁸. The task was assigned to Iran Aircraft Manufacturing Industrial Company (HESA) a ministry of defense entity¹⁹. So the dual nature of aviation in Iran was well preserved even during the

¹⁵ Although Mahan Airlines is a private airline, it did and still does enjoy vast political support. It was the first airline to secure a government edict for a large sum of hard currency in 1997 to purchase its first Airbus aircrafts.

¹⁶ Mostly flights to neighboring countries.

¹⁷ Then Ministry for Post, Telegraph and Telephone.

¹⁸ The HESA IrAn-140 or Iran-140 is a short-range twin-turboprop airliner based on the Antonov An-140 and built under license by HESA of Iran. The Iran-140 is able to seat 52 passengers, land on a dirt airstrip and fly almost 3,000 km (1,865 miles) before refueling. It can be configured to carry passengers, cargo, or a combination of the two. It already has experienced 2 crashes with fatalities (see Table 1).

¹⁹ Located in Shahin Shahr, Isfahan, HESA was established in 1976. It belongs to the Iran Aviation Industries Organization (IAIO). The original factory was built by Textron.

expansion period with ministry of transportation in charge of airports and commercial airlines and ministry of defense in charge of manufacturing and production.

Table 2.
Incidents Summary Statistics

Year	Incidents	Fatalities
1992	1	39
1993	1	131
1994	2	98
1995	0	0
1996	0	0
1997	1	80
1998	0	0
1999	0	0
2000	1	6
2001	1	29
2002	2	163
2003	1	302
2004	1	43
2005	2	131
2006	3	75
2007	0	0
2008	2	68
2009	3	186
2010	2	0
Total	23	1351

3.4. Present Conditions

If the 80's were time of firm control and limited expansion, commercial aviation expanded exponentially in 1990's. However the rapid expansion came at a price; and compromising the quality. Almost all the new airlines began their operations with leased aircraft and the majority relied on Russian manufactured aircraft provided by Russia, Ukraine and other former Soviet Union countries. Kish Air launched its operations using a TU-134 and Caspian leased TU-154 M airplanes. These airplanes were new to Iran and few Iranian crews were available to operate them originally. Thus wet leasing, or leasing an aircraft with flight crew became the norm of the industry. Also most of new entries acquired their own fleet later, however companies such as Iran Air Tours, Caspian Airlines and Kish Air purchased TU-154 M aircraft and not western made aircraft. As Russian aircraft entered Iranian airspace the number

of airplane crashes began to rise, making Tupolev a synonym of air insecurity. There have been 23 incidents involving passenger aircraft. 1351 individuals, mostly civilians, were killed in these accidents.

Sanctions restrained the expansion of Iranian airlines significantly as new Iranian airliners had access to neither western aircraft nor parts for their existing fleet or investments. Thus they have affected the flight safety and endangered the lives of passengers according to international observers. In 2005 after discussing the issue ICAO concluded: “the United States sanctions against the Islamic Republic of Iran have adversely affected the safety of civil aviation. The findings of ICAO should be upsetting to anyone, who is committed to the safety of civil aviation and the safety of air transport.” However the situation became even worst with Security Council’s tightening the grip of sanctions to control Iran’s nuclear program. The recent sanctions have prompted companies such as Fokker Services to cut back on their support systems and requesting Iranian airliners to stop working on any part that could be American made.²⁰ This has created great difficulties for Iranian airlines whose fleets include Fokker 100 and Fokker 50 airplanes. Ever finding the middle way recently Iranian airlines have employed British made BAE and MD-88. Although both are western made airplanes, they are not manufactured any longer.

Despite sanctions past two decades witnessed a dynamic aviation industry in Iran with airlines coming and going. At least 30 airlines entered the market in Iran since 1988 (see Table 3). Not all of them were successful. Tara Airlines²¹ and Safat Airlines were active for less than a year. Bonyad Airlines announced bankruptcy two years after starting its operations, then resumed its operations, then ceased them. Taftan Airlines announced bankruptcy in 2006 and its Fokker 50 fleet was requisitioned by the court. Ilam Airlines, Atlas Airlines, Tehran Airlines and TA-Airlines were founded and received necessary approvals, but never became operational. There are also several other companies who have received the initial permit, but never received an Aviation Operator’s Certificate (AOC) from IR-CAO. In 2006 IR-CAO announced that no more AOC would be granted however President Ahmadinejad’s administration has overruled IR-CAO since then and granted permission to three new airlines to start operations out of which Ata Airlines is already operational and Sahand Airlines has just begun its operations. There is talk of more airlines and government agencies such as Iran Cultural Heritage and Tourism Organization (ICHTO) are seeking necessary permits and funds to start an airline.

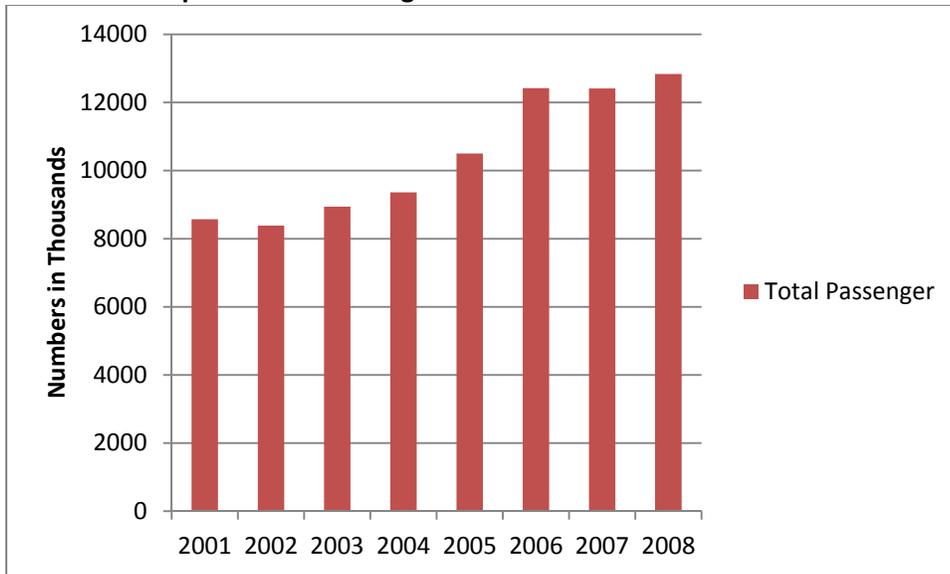
The large number of airlines in Iran could be misleading about the entry barriers. Borenstein (1989) defines an aviation market as the route between an origin and a destination. During the past years the process to enter a market has not been eased and the barriers to entry remain significant in Iran. Thus entering the markets does not end by receiving an AOC. It also requires entering the routes. In Iran having an AOC does not permit an airline to fly in routes it finds profitable. Every new flight and its schedule must approved by IR-CAO authorities. After receiving IR-CAO’s approval different bodies must be coordinated and agree upon the new schedule. These include, but not limited to, airports authorities’, airports security and local government agencies. Any new service also requires investment.

²⁰ Author’s interview.

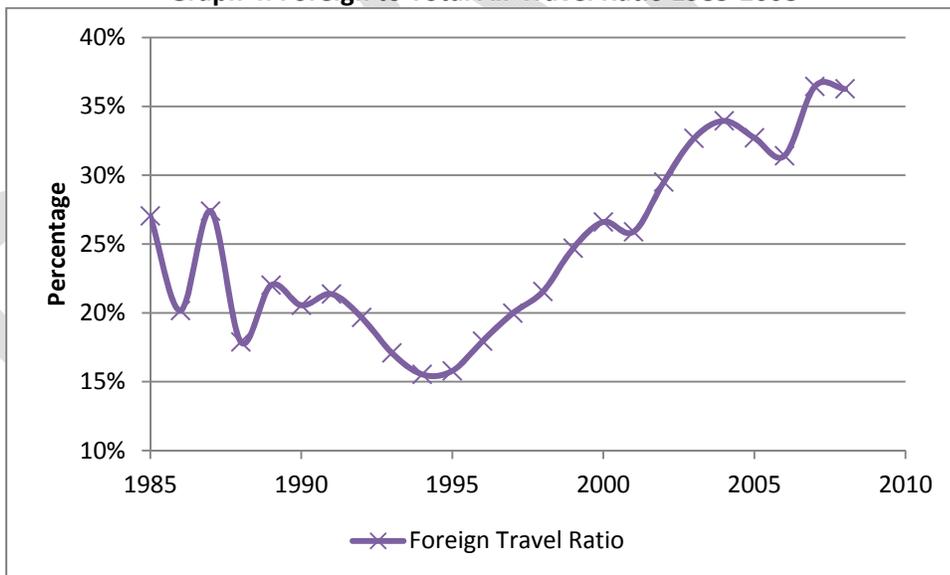
²¹ Since 2009 Tara Airlines is active in helicopter and cargo services.

A travel agency must be found who would be willing to pre-purchase enough seats to make the service financially sustainable. After all these expenses the continuity of service remains in the hands of authorities, who can withdraw their support as they see fit.

Graph 3. Total Passenger Domestic Air Travels 2001-2008



Graph 4. Foreign to Total Air Travel Ratio 1985-2008



In the same time the market has been growing both in the size and in the scope. The number of domestic air travel passengers increased from almost 8.6 million in 2000 to 12.8 million in 2008 demonstrating an overall growth of 50% (see Graph 3). It must be noted that this trend has slowed down significantly from 2007 to 2008, where the number domestic air travel passengers increased from 12.4 million to 12.8 million exhibiting a slight increase of 3%. Both the number of foreign air travel

passengers and their market share have been increasing as well. The total number of foreign air travel passengers increased to 7.3 million in 2008, which is 36% of total air travels in Iran and demonstrates a 108.2% increase in the size of foreign air travels in Iran (see Graph 4). Of course it might be argued that this increase is caused by high demand for traveling to UAE, however this must be tested in further studies.

Table 3.
Names and Status of Iranian Airlines

	AIRLINE	BASE(S)	REMARKS	Founded	Operational
1	Aria Air	Bandar Abbas	Pax	2000	Yes
2	Arvand Airlines	Abadan	Pax & Cargo	1999	No
3	Ata Airlines	Tabriz	Pax	2009	Yes
4	Atlas Air			NA	No
5	Bonyad Airlines		Bankruptcy	1995	No
6	Arsh Air		For Asian routes	NA	No
7	Caspian Airlines	IKA	Pax	1993	Yes
8	Chabahar Airlines	Chabahar	Acquired by Iran Air	1998	Yes
9	Eram Air		Pax	2005	Yes
10	Fars Qeshm Air	Qeshm	Pax & Cargo	2003	Yes
11	Ilam Airline	Ilam	Pax	NA	No
12	Iran Air	IKA	National Flag Carrier	1962	Yes
13	Iran Air Tours	Mashhad	Pax	1973	Yes
14	Iran Aseman Airlines	Tehran	Pax & Cargo	1980	Yes
15	Kish Air	Tehran	Pax	1988	Yes
16	Mahan Air	IKA	Pax & Cargo	1991	Yes
17	Naft Air	Tehran	Pax	1993	Yes
18	Payam Air	Payam Airport	Airmail	1997	Yes
19	Qeshm Air	Deyrestan	Pax	1996	No
20	Safat Airlines		NA	NA	No
21	Safir Airlines	Tehran	Cargo	1988	Yes
22	SAHA Air Lines	Tehran	Pax & Cargo	1988	Yes
23	Sahand Airlines		Pax	2010	Yes
24	Simorgh Air		Pax	2010	No
25	TA-Air Airline		NA	NA	No
26	Taban Air	Mashhad	Pax & Cargo	2006	Yes
27	Taftan Airlines	Zahedan	Pax	NA	No
28	Tara Airlines		Helicopter	2009	Yes
29	Tehran Airlines	Tehran	NA	2001	No
30	Zagros Airlines	Abadan	Pax	2007	Yes

It must be noted that there is no market based approach to pricing in Iranian commercial aviation. Pricing has been and still is a matter of government's decision and changes as seen fit by the authorities. Head of IR-CAO announces the official airfare for the different routes and airlines are obliged to charge a fixed price for the flight, independent of the season, time, weekday and all other demand determinants in aviation market. Government also determines the operational costs of airlines. It decides the subsidy it pays them on fuel, the parking rate they should pay for their space in the airports, the usage fee for navigation and transit services as well as the mandatory security services. Thus an airline receives bills from IR-CAO, NIOC, IAHC and IRGC, to mention a few. It should pay taxes to the municipalities and government. It must keep its fleet in good standing and pass periodic inspections to renew its AOC. In order to survive, few private airlines in Iran sell their own tickets to customers. Most Iranian airliners pre-sell the seats in a flight blocks to travel agencies at a discounted rate, sometimes up to 30% below the government's nominal fare. Their flights are usually chartered by a group of travel agencies, who later on sell them to their consumers. The question is if the fixed price approach reflects the realities of air travel demand in Iran²². To show the fallacy of this assumption we test for the seasonality of demand for air travel in Iran.

4. Analysis

There are several questions we should like to investigate, however we must take notice of the structural changes in the market, the increasing role of foreign air travels, and the expansion of airport network. At this stage we examine the seasonality of demand for air travel in Iran to demonstrate that the official fixed pricing approach does not reflect the realities of demand for air travel in Iran. We focus on the data for March 2004 through March 2005, Iranian calendar year 1383. This is one of more accurate reports available and it has passed our QA tests. Tables 4 through 6 summarize the results for seasonality tests at Mehrabad, Kish Island and Mashhad airports.

According to table 4 for air travels to and from Tehran both coefficients are significant. On average 315'000 passengers have arrived in Mehrabad airport per month. However an extra number of 49'000 passengers have arrived during the summer. Since Tehran is both the political and business capital of country seasonality alone cannot explain all the variation in the air travel demand at this airport, however using seasonality dummy variable alone model has an R^2 of .52 which is significant.

Table 5 summarizes the results for Kish Island, which is a major resort and free trade zone. Here too seasonality coefficients are significant. On average more than 32'000 passengers have arrived in Kish island airport per month with extra 15'000 passengers during summer and winter, demonstrating a 50% increase in the monthly traffic to the Island. For the holy city of Mashhad similar results hold according to Table 6. On average 74'000 passengers have arrived in Mashhad airport per month with an extra 42'000 passengers during summer. This is even more than half of the regular traffic and signals an

²² As this paper was being finalized Iranian government finally agreed to a %30 increase in airfares in October 2010.

increase of 58.3% in demand for air travel during the summer. Although both models are simple seasonality models however both have a high R^2 , .72 for Kish Island and .82 for Mashhad.

Table 4. Seasonality Analysis for Mehrabad Airport

No of Obs.	F(1,10)	P > F	R ²	Adj R ²
12	10.84	0.0081	0.5201	0.4721
Indep. Var.	Estimated Coefficient	Standard Error	t Stat	P > t
SeasonalDum	49086	14909	3.29	0.008
Constant	315090	7455	42.27	0.000

Table 5. Seasonality Analysis for Kish Island Airport

No of Obs.	F(1,10)	P > F	R ²	Adj R ²
12	25.11	0.0005	0.7151	0.6867
Indep. Var.	Estimated Coefficient	Standard Error	t Stat	P > t
SeasonalDum	14595	2913	5.01	0.001
Constant	32330	2060	15.7	0.000

Table 6. Seasonality Analysis for Mashhad Airport

No of Obs.	F(1,10)	P > F	R ²	Adj R ²
12	46.79	0.0000	0.8239	0.8063
Indep. Var.	Estimated Coefficient	Standard Error	t Stat	P > t
SeasonalDum	42182	6166	6.84	0.000
Constant	73726	3083	23.91	0.000

The pattern of demand is more apparent when we look at the histograms for air travels in these three locations. In all three places number of passengers declines sharply after the 6th month in Iranian calendar, which marks the end of summer and the beginning of the school and academic year. Demand stays low for the 7th and 8th months and then it begins to rise from the 9th month in Persian calendar and it reaches another peak as Iranian New Year approaches. It falls down in the first month of Persian calendar but it begins to increase as summer approaches and it reaches its annual peak in the middle of summer.





5. Conclusion

We establish that demand for air travel in Iran is indeed seasonal and increases during months of summer and last month of winter. Based on this evidence the official fixed pricing approach in this market seems unrealistic and provides travel agencies and not the airlines to practice price discrimination freely. Using charter flights travel agencies combine air tickets with hotels, meal plans and other travel items. By adjusting the total price as demand fluctuates travel agencies benefit from increases in demand and protect their windfalls when demand declines. On the other hand airlines have to oblige these agencies when demand for air travel declines by offering blocks of the seats on their flights at an even more discounted price. As the demand for air travel increases in Iran, the airlines do not benefit from it as much as travel agencies do. This has resulted in a paradoxical situation, while demand for air travel has been increasing in Iran, Iranian airlines continue to suffer losses.

True sanctions have been hurting Iranian commercial aviation by denying Iranian airlines access to safe and modern aircraft, however the present pricing regime denies them the ability to afford freshly manufactured aircraft. It does not leave them with many resources to challenge the sanctions or offer higher prices for the forbidden aircraft. It only makes them more dependent on the government's

subsidies. Surprisingly while IR-CAO expects the number of air travel passengers increases to xxx by 2015 there is no hope for a change in pricing regime.

Further studies should investigate the internal dynamics of aviation industry in Iran. There are many questions unanswered, was there enough demand for the new airports? Is the increase in demand for air travel to GCC countries has helped Iranian airlines or hurt them by increasing the competition from neighboring countries' airlines? How Iranian airlines are faring in foreign air travel markets? And so many other questions, this is just the beginning and not the end.

DRAFT

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