

Corporate Failure, Supply Shocks and Government Bailouts: A Case Study of Aloha Airlines*

Akihiko Kawaura

Professor
Department of Policy Studies
Doshisha University
Kyoto 602-8580 Japan

March 11, 2011
Working Paper 11-3

Abstract

This paper investigates the bankruptcy of Aloha Airlines and its exit from Hawaii's interisland passenger market in order to examine whether government intervention is warranted based on the presumed benefits to the general public. A regression analysis of interisland traffic volume does not identify any substantial decline in interisland passengers immediately following Aloha's closure. A government's decision to bailout a firm should incorporate information on market structure, as the presence of excess capacity can alleviate damage to consumers.

JEL codes: L13; L52; L93

Keywords: bankruptcy; exit; excess capacity; bailout; airline

*The author thanks Eiji Fujii, Sumner LaCroix and James Mak for helpful comments on an earlier version of the paper, and Akiko Sugimoto for her excellent research assistance.

1. Introduction

Bankruptcy of a company and its exit from input and final good markets is one of several channels by which markets adjust to supply or demand shocks. Efficiency of resources allocation is improved when resources are withdrawn from a proven loss-making use and moved to a potentially profitable one. This general principle, however, allows exceptional cases in which a government rescue of failing corporations could theoretically enhance market efficiency. For example, Gorton and Huang (2004) present a model in which governments facilitate the reallocation process by lessening liquidity constraints.

Irrespective of the theoretical foundations for a bailout and the difficulties in successfully executing a bailout, governments in democracies have private incentives to extend assistance to some troubled companies. First, elected officials may have vested interests in survival of some businesses. Faccio, Masulis and McConnell (2006) find that politically connected firms are more likely to receive government bailout. Second, politicians may make efforts to appear benevolent by helping a business on the verge of collapse, arguing that its service is of great benefit to the population, hence voters, in general.¹

Whether the arguments for a particular bailout satisfy necessary theoretical criteria or are merely self-serving, it is surely impractical to expect that a long-run cost-benefits analysis of a public rescue could be available to government officials and the public during the short period of bailout decision-making. Projections of various economic scenarios that could materialize after a bailout (or in its absence) inevitably depend on assumptions regarding the effectiveness of a bailout and the future state of the economy. This difficulty in turn invites a focus on the immediate cost of a large corporate failure, with the failing company and government emphasizing how the supply shock from the firm's exit could damage both consumers and the firm's workers.

¹ Politicians' calculations of voter perceptions could create the situation in which theoretically sound bailouts are delayed. See Brown, O'Neil and Ding (2005).

The objective of this paper is to make an assessment of the short-run cost of corporate failure by analyzing data from Hawaii's interisland air markets both before and after the 2008 collapse of Aloha Airlines. The Hawaii State government rushed to develop and implement a rescue package but Aloha's sudden exit cut short these efforts. The "almost implemented bailout" provides an opportunity to see whether the interisland market disruptions proved to be sufficiently large to justify a bailout.

The paper is organized as follows. The next section gives a brief background to Hawaii's interisland passenger market, including events leading to the shutdown of Aloha's operations. The third section analyses the interisland passenger volume at the time of the supply shock in the form of Aloha's exit, and evaluates if there was any significant disruption to the market. The section also uses daily arrival data to the state to assess if there was any immediate consequence on the tourism. The fourth section examines the air travel price data to investigate the impacts on the price dimension, which is followed by the concluding section.

2. Hawaii's Interisland Air Travel and Exit of Aloha Airlines

In 1959, Hawaii, an island chain in the Northern Pacific Ocean, became the 50th state in the United States. Most of its people reside on six islands separated from each other by 30-250 miles. Since the advent of the civil aviation, the interisland flight has been an important means of transportation for the state's population. Figure 1 shows the annual number of interisland passengers since 1960. Annual interisland passengers more than tripled in the 1960s and doubled in the 1970s. After 1981, annual passenger counts never dipped below 7 million a year.

The principal providers of this service were Hawaiian Airlines and Aloha Airlines, which started operations in 1929 and 1946, respectively. They dominated the market in the post-WWII period. Although there were occasional efforts by a third carrier to enter the interisland passenger market using low fare as leverage, challenges were short-lived.² The

² Forman (2005) presents a detailed history of Hawaii's civil aviation industry such as

dominant position of Hawaiian and Aloha did not, however, guarantee their financial health. Swings in profitability led to liquidity problems and debt restructuring on several occasions.³ The terrorist attacks of September 2001 led to a sharp slump in interisland air travel, which also aggravated their performance.

In order to revive their profitability, the two airlines received approval from the federal government in September 2002 to implement an agreement for coordinating their capacity to equally divide the interisland market. In the event a party exceeded its authorized share, a penalty would be imposed according to the deviation from the agreement. Although this antitrust immunity did not allow collusion in the pricing, Blair, Mak, and Bonham (2007) and Kamita (2010) found that the agreement led to increases in interisland airfares.⁴ Kamita (2010) further found that the price hike persisted after the agreement expired in 2003. In spite of the price rise that accompanied the antitrust immunity, the financial conditions of both airlines remained unstable. Hawaiian filed for Chapter 11 bankruptcy protection in March 2003 (to emerge in April 2005), and Aloha joined in December 2004 (until February 2005).

Competition on the price dimension resumed with the entry of a subsidiary of Phoenix-based Mesa Air Group to the interisland market in June 2006.⁵ Between Hawaiian and Aloha, it was the latter that suffered most from the return of price competition due to its greater reliance on interisland routes in its operations. Aloha filed for Chapter 11 bankruptcy protection on March 20, 2008, less than three years after exiting the previous protection. In response to the filing, state legislators proposed a financial rescue that could include loan guarantees, landing fee waivers and

rivalries between the two companies and the entry and exit of other airlines, including Mid Pacific Airlines (1981-1988) and Mahalo Airlines (1993-1997).

³ For example, Hawaiian filed for Chapter 11 bankruptcy protection in October 1993, to exit in September of the following year.

⁴ Brueckner (2003) identified an opposite effect of antitrust immunity in the analysis of cooperation among international carriers in the form of codesharing and antitrust immunity: The presence of immunity reduced the fare for interline passengers.

⁵ Island Air, an Aloha Airlines' subsidiary until May 2004, was independently servicing 17 interisland routes at that time. Entry of Mesa resulted in lay-off of 65 of Island's 415 workers and termination of its five routes in December 2006. See Daysog (2006).

the elimination of the excise tax on jet fuel to lessen the financial burden of the airline. Daysog (2008) quotes State Senate Ways and Means Committee Chairwoman's comment, "It's not unprecedented for us to try to assist businesses that are important to Hawaii."⁶

On March 30 Aloha announced its intent to cease all passenger operations the following day. Governor Linda Lingle asked the U.S. Bankruptcy Court not to allow the company to terminate its passenger service, and made the statement that "Our main concerns are threefold – first and foremost the 1,900 employees and their families, the need for continued air service for our residents and visitors, and protection of the state's long-term fiscal and economic interests." Since the State of Hawaii is an island chain, interisland air service is a vital part of the transportation network for its residents. The State Government's attempts to assist a failing airline business could be interpreted as an effort to protect the infrastructure for the benefit of the general public.

No viable financial rescue package materialized by the end of the month, and the Governor's request was rejected by the U.S. Bankruptcy Court. Aloha Airlines shut down its passenger operation on April 1. The sudden exit of a major company from the air transport market, combined with the willingness on the side of local elected officials to extend financial help, provides an opportunity for a case study into the merits of government intervention against the stated objective of serving the general public. The short period of time between the airline's bankruptcy filing and termination of its operation implies that market adjustments leading up to its exit must have been absent, thereby allowing an assessment of consequences of its exit without any complications from factors that otherwise might have arisen in the intervening period. This paper focuses on the second "concern" in the Governor's statement, and investigates whether supply of the local air travel service was disrupted because the State of Hawaii did not rescue Aloha Airlines. I proceed from the proposition that the greater the disruption to interisland air service caused by Aloha's exit, the stronger the case for government intervention would have been.

⁶ At the time of Hawaiian's bankruptcy in 1993, the state approved a \$14 million loan guarantee for the company.

One perspective for evaluating the potential impact of Aloha's exit on interisland travel is to examine the industry's market structure. The fact that the federal government granted Aloha and Hawaiian the rights to divide the market suggests that they were duopolists with excess capacity. The fare increase that accompanied the agreement, however, invited entry of the third carrier, and exacerbated the capacity issue.⁷ If the exit of Aloha was part of a process by which market equilibrium was restored, loss of its interisland flights should not have brought about significant interruptions to the market. Thus, whether the remaining airlines could meet "the need for continued air service for our residents and visitors", in the wording of Governor's statement, is the criterion to judge the cost of Aloha's exit.

3. Impact on Interisland Air Travel

The first objective of the paper is to empirically investigate whether Aloha's exit led to a disruption of the interisland passenger travel. If excess capacity led to Aloha's exit and the remaining carriers filled the gaps left by Aloha, we may not find a drop in interisland travel volume following Aloha's shutdown.⁸ The analysis tests whether there was a fall in monthly interisland passengers at Honolulu International Airport immediately after Aloha's exit.⁹ The airport in Honolulu serves as a hub for interisland traffic, and is the only airport that is connected with all the other main islands by scheduled flights. Thus, its passenger data reflect the general local market environment.

Figure 2 shows the number of interisland passengers at the Honolulu International Airport, which exhibits large monthly fluctuations. This is because the interisland flights serve both local residents and

⁷ Goolsbee and Syverson (2008) investigated the development of route network of Southwest Airlines and found that incumbent airlines reduced airfares in the face of the threat of entry. Graham, Kaplan and Sibley (1983) argued that, prior to the deregulation of the 1980s, airline regulation was associated with excess capacity in the industry.

⁸ Wiles (2008) described efforts by remaining carriers to quickly increase the interisland flights after Aloha's exit.

⁹ Monthly interisland passenger data are collected by the Airports Division, Hawaii State Department of Transportation.

out-of-state tourists, and the latter passengers change substantially depending on the tourism season. This is demonstrated by the corresponding movement of arriving passengers to the state in the same graph.¹⁰ Thus, in the regression analysis to identify the determinants of monthly interisland passengers (ISLAND), the monthly visitor arrival from out-of-state (VISITOR) enters as an explanatory variable in the following specification:

$$\text{ISLAND}_t = \alpha + \beta_1 \text{VISITOR}_t + \beta_2 \text{FARE}_t + \sum \Phi_k \text{DUMMY}_k,$$

where the price effect is isolated by the fare index at the airport in Honolulu (FARE). The quarterly “air travel price index (ATPI)”, which consists of the price charged by the airlines plus any additional taxes and fees, have been published by the Bureau of Transportation Statistics (BTS) of the U.S. Department of Transportation since the first quarter of 1995 for 85 U.S. airports.¹¹ The FARE variable is its index at the Honolulu International Airport. Dummy variables are for April 2008, May 2008, and the period prior to September 2001 (Pre-911), the first two of which are the primary concern of the inquiry. The sample period is the 92 months between October 2000 and May 2008, and summary statistics of the variables are presented in Table 1.

Regression estimates are obtained with FARE converted to a constant-price base. Since the airfare is presumed to be simultaneously determined with the passenger numbers, the estimates are obtained by the two-stage least squares (2SLS). The FARE is instrumented by the national ATPI series. Regression results are presented in Table 2. Three specifications differ by the treatment of month and year dummies. In all specifications the number of visitors to the islands (VISITOR) is positively associated with the interisland travel volume, although the magnitude of

¹⁰ The number of out-of-state arriving passengers is published by the State Department of Business, Economic Development and Tourism (DBEDT).

¹¹ The index is based on a 10 percent sample of the tickets used during a given quarter at individual airports collected as the Passenger Origin and Destination (O&D) Survey. For price comparison purposes, itineraries flown in each quarter are matched up with similar itineraries in other quarters. This process is designed to eliminate the index

the impact varies widely. The estimated coefficients for the April 2008 and May 2008 dummies are not statistically significant in any specification. The potentially negative impact of the grounding of Aloha's fleet on interisland traffic volume is not detected, which provides little support for a public rescue of the airline in order to mitigate severe market disruptions from the bankruptcy.

The preceding analysis treated the visitor arrival to the state as one of the determinants of the interisland flight passengers. It is, however, possible that the interisland market conditions affect the visitor arrivals, as tourists may plan their Hawaii trip around their ability to book a block of interisland seats on desired dates as part of their itinerary. If this is the case, visitors to Hawaii may have decreased as a result of Aloha's shutdown.¹² The estimated coefficient on the visitor arrival variable could then be biased as it may be picking up supply shocks that would otherwise be captured by estimated coefficients on the April and May 2008 dummy variables. The following inquiry tests this possibility by investigating whether visitor arrivals fell in the period following Aloha's exit.

The analysis uses a sample of daily passenger arrivals published by DBEDT, which contains 3,651 observations from September 2, 2000 through August 31, 2010. The impact of the Aloha closure is studied as an intervention analysis using an ARMA (autoregressive and moving average) estimation framework:¹³

$$y_t = \mu + \gamma y_{t-1} + \theta \varepsilon_{t-1} + \sum_{s=1} \Lambda_s EXIT_s + \sum_{p=1}^{10} \Phi_p YEAR_p + \sum_{q=1}^{11} \Psi_q MONTH_q + \sum_{r=1}^6 \Omega_r DAY_r + \alpha \text{ Sep_2001} + \varepsilon_t.$$

The immediate effect of Aloha's exit should be captured by estimated

change that arises from the itinerary composition shifts at individual airports.

¹² Aloha's mainland routes were also terminated at the end of March, which could negatively affect tourist arrivals in Hawaii.

¹³ Baumann, Matheson, and Muroi (2009) used an ARIMA estimation framework to investigate the effect of sports events on Hawaii's tourism as proxied by DBEDT's daily passenger arrival data.

coefficients of the EXIT dummy variables representing (i) seven days between April 1 and 7 as well as (ii) eight weeks in April and May. As tourist flows to Hawaii fluctuate across years, months, and days of the week, the regression also include dummy variables for individual years, months, and days of the week. The Sep_2001 dummy takes a value of one for September 11-13, 2001 to isolate the effect of airport closure following the terrorist attacks.¹⁴

Regression estimates are reported in Table 3. The first column (I) shows the daily effects for April 1-7, and the second (II) the weekly effects for the eight weeks following Aloha's exit. The coefficients of the autoregressive and moving average process are statistically significant at the 1% level in both of them. Although many of the estimated coefficients on the EXIT dummies are negative, none of them are statistically significant. The results are robust to changes in specifications, such as various combinations of AR and MA dimensions between 1 and 3 and first-differencing of passenger arrival data (i.e., estimates with ARIMA framework). The exit of Aloha Airlines did not give rise to a large fall in air travel to Hawaii, and the estimated negative coefficients are not statistically significant.¹⁵ This result strengthens the results obtained from the regression analysis of monthly interisland passenger data. Termination of Aloha's operation did not result in an abrupt loss of interisland passengers or tourists to Hawaii.¹⁶

¹⁴ Although it is likely to take time for scheduled flights to resume their normal operation after airport closures, the dummy is specified to cover only the actual closure dates due to the difficulty of determining the length of impacts. See Rupp, Holmes and DeSimone (2005) for a detailed study on the schedule recovery after closures.

¹⁵ ATA Airlines, an airline servicing the routes between Hawaii and four mainland cities, filed for bankruptcy to immediately cease its operations on April 2, 2008. If ATA's closure had resulted in a decrease in the visitor arrival to the state, the estimated coefficients would have been biased for overestimating negative impacts of Aloha's exit. In this sense, that the exit of Aloha did not lead to a reduction in arrivals represents a conservative assessment.

¹⁶ Lawrence S. Hershfield, Chairman of Hawaiian Airlines' Board of Directors, wrote about Hawaiian's response to the exit of Aloha in his "Letter to Shareholders" attached to the company's Annual Report 2008: "Responsibility fell to Hawaiian Airlines to prevent a meltdown in the State's transportation system,... In this regard, we can all be very proud of our Company's performance. Instead of chaos, we had order at each of our airports. Not one of Aloha's interisland customers was left stranded." Vorsino (2008), on the other hand, reported anecdotal evidence to the contrary, in terms of substantial confusions and complaints among Aloha's customers on April 1, 2008.

4. Effects on Airfare

Even if the exit of one major carrier did not constitute a supply shock that dented interisland travel, it could have reduced competition among remaining airlines, thereby exerting upward pressure on airfares. This section investigates whether closure of Aloha led to higher fares in Hawaii and, if it did, examines their magnitude relative to the price changes observed during the Aloha-Hawaiian antitrust immunity in 2003 and after the entry of a third airline in 2006. The price index to be used is BTS' ATPI, which is available for 60 quarters from the first quarter of 1995 to the last quarter of 2009 for the total of 85 U.S. airports, including four in Hawaii.¹⁷

The objective of the analysis is to identify whether changes in airfares at Hawaii airports deviated from those at other U.S. airports. The percent changes in fare indices at individual airports are regressed, in a fixed effects specification, in the following form;

$$y_{it} = \sum_{i=1}^{85} \Phi_i y_i + \sum_{t=2}^{60} \Psi_t * Q_t + \sum_{s=1}^{15} \Omega_s * HAWAII_s + \varepsilon_{it}.$$

Explanatory variables include quarterly time-dummies (Q_t) as well as dummy variables representing airports in Hawaii ($HAWAII_s$). The Hawaii dummies are specified for five quarters (i) after Aloha's exit in April 2008, (ii) following the antitrust immunity in the first quarter of 2003, and (iii) following entry of a third carrier in the third quarter of 2006. If these three events, i.e., Aloha exit, antitrust immunity, and new entry to the market, led to price changes unique to Hawaii, estimated coefficients on their dummies should be non-zero and statistically significant.

Estimates are presented in Table 4. The first column (I) uses changes in travel costs over the previous quarter as the dependent variable, and the second column (II) examines the determinants of the fare changes over the same quarter of the previous year. The estimated coefficient on the

¹⁷ The four airports (and the island on which each is located) are: Honolulu (Oahu), Kahului (Maui), Kona (Hawaii), and Lihue (Kauai).

first dummy for the Aloha exit in (I) suggests that the ticket price in Hawaii showed an extra 14.9 percent point increase over the nationwide change in the quarter immediately after the Aloha closure. It is notable, however, that the price hike was not sustained thereafter; no statistically significant positive coefficient was identified in the following four quarters. This finding is consistent with the estimates for annual fare changes in (II), in which estimated coefficients for the quarters following Aloha's exit grew consistently smaller from 22.8 in 2008_Q1 to 6.172 in 2009_Q1. In 2009_Q2, a year after the exit, the fare change at airports in Hawaii was found to be smaller by 11.8 percent point than the nation in general.

The fare changes observed at the time of the implementation of antitrust immunity provide an interesting comparison. Estimated coefficients on dummy variables for the period of antitrust immunity given to Hawaiian and Aloha in 2003 in (II) suggest that the two airlines managed to maintain higher airfares for an extended period, with the annual price increase in Hawaii 15.8 percent points higher than nationwide in the final quarter of 2003. The fare continued to increase in the first quarter of 2004, as demonstrated by the positive and significant coefficients of 2004_Q1 in both specifications.¹⁸ Although the existing market structure was a duopoly in both periods, the competitive force must have been more pronounced after Aloha's exit in which there was no antitrust immunity. The estimates for the period after entry of the third carrier further support the importance of the competition. As a result of entry, air travel began to become less expensive in Hawaii compared with the rest of the country.

5. Conclusion

This paper investigated the impact of Aloha Airlines' exit on Hawaii's consumers by examining how the exit affected interisland traffic volume. The regression analysis did not identify any statistically significant decline in interisland passengers immediately following Aloha's demise. Nor did the number of out-of-state visitors show a statistically significant drop. Clearly, the remaining carriers responded by filling gaps left by Aloha. The Aloha

¹⁸ This result is consistent with Kamita (2010), which found that the price effect of antitrust immunity remained after it has expired.

exit is consistent with theoretical predictions regarding how a market with excess capacity would adjust to the exit of a firm. Although interisland air consumers were presented with some increase in airfares after Aloha closed down, the price effect grew smaller as adjustments took place in the market.

These results suggest that governments should be careful in assessing the option of a corporate bailout to a large corporation in a vital oligopolistic industry. If the rationale for the rescue is to alleviate potential negative impacts on consumers in general, it is critical for governments to take into account the existing market structure. Analysis of the Aloha exit shows that consumer losses stemming from a large firm's exit from an oligopolistic industry with excess capacity could be relatively small even in the short run.

REFERENCE

Baumann, Robert W., Victor A. Matheson, and Chihiro Muroi, "Bowling in Hawaii: Examining the effectiveness of sports-based tourism strategies" *Journal of Sports Economics*, Vol. 10, No. 1, February 2009, pp. 107-123.

Blair, Roger D., James Mak, and Carl Bonham, "Collusive duopoly: The economic effects of the Aloha and Hawaiian Airlines' agreement to reduce capacity" *Antitrust Law Journal*, Vol. 74, No. 2, 2007, pp. 409-438.

Brown, Craig O'Neil, and I. Serdar Ding, "The politics of bank failures: Evidence from emerging markets" *Quarterly Journal of Economics*, Vol. 120, No. 4, 2005, pp. 1413-1444.

Brueckner, Jan K., "International airfares in the age of alliances: The effects of codesharing and antitrust immunity" *Review of Economics and Statistics*, Vol. 85, No. 1, 2003, pp. 105-118.

Daysog, Rick, "Senators explore ways to help Aloha in bankruptcy" *Honolulu Advertiser*, March 25, 2008.

Daysog, Rick, "Island Air says go! to blame for layoffs" *Honolulu Advertiser*, December 2, 2006.

Faccio, Mara, Ronald Masulis, and John J. McConnell, "Political connections and corporate bailouts" *Journal of Finance*, Vol. 61, No. 6, 2006, pp. 2597-2635.

Forman, Peter N., *Wings of Paradise: Hawaii's Incomparable Airlines*, Kailua, Hawaii: Barnstormer Books, 2005.

Goolsbee, Austan, and Chad Syverson, "How do incumbents respond to the threat of entry? Evidence from the major airlines" *Quarterly Journal of Economics*, Vol. 123, No. 4, 2008, pp. 1611-1633.

Gorton, Gary, and Lixin Huang, "Liquidity, efficiency, and bank bailouts"

American Economic Review, Vol. 94, No. 3, 2004, pp. 455-483.

Graham, David R., Daniel P. Kaplan, and David S. Sibley, "Efficiency and competition in the airline industry" *Bell Journal of Economics*, Vol. 14, No. 1, 1983, pp. 118-138.

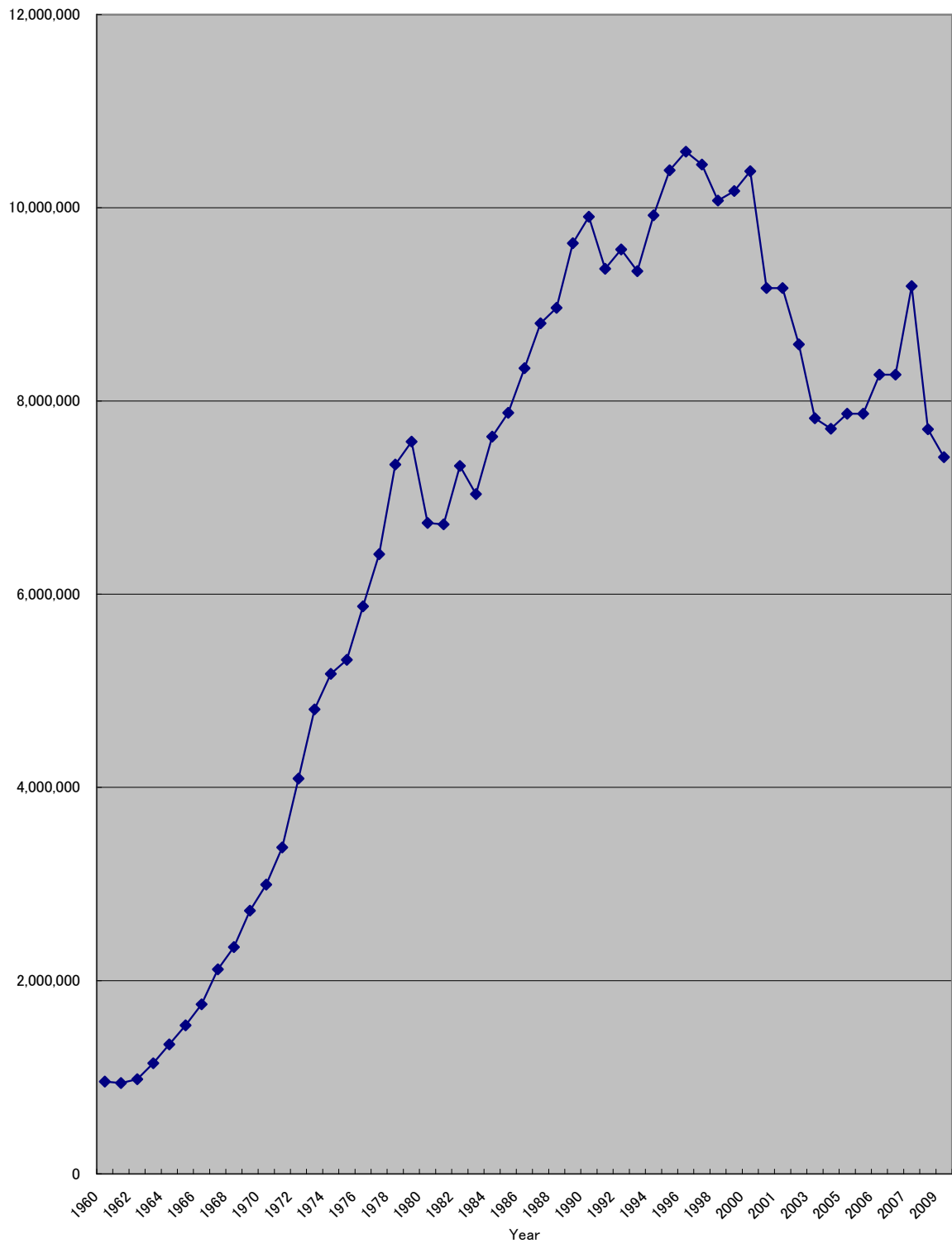
Kamita, Rene Y., "Analyzing the effects of temporary antitrust immunity: The Aloha-Hawaiian immunity agreement" *Journal of Law and Economics*, Vol. 53, No. 2, 2010, pp. 239-261.

Rupp, Nicholas G., George M. Holmes, and Jeff DeSimone, "Airline Schedule Recovery after Airport Closures: Empirical Evidence since September 11" *Southern Economic Journal*, Vol. 71, No. 4, 2005, pp. 800-820.

Vorsino, Mary, "Stranded passengers swamp ticket counters" *Honolulu Advertiser*, April 2, 2008.

Wiles, Greg, "Remaining Isle carriers move to fill void from Aloha's closing" *Honolulu Advertiser*, April 1, 2008.

Figure 1. Number of Interisland Passengers: 1960 - 2009



Source: State of Hawaii, *State of Hawaii Data Book*, various issues.

Figure 2. Interisland Passengers at the Honolulu International Airport and Visitor Arrival to the State: Oct. 2000 - May 2008

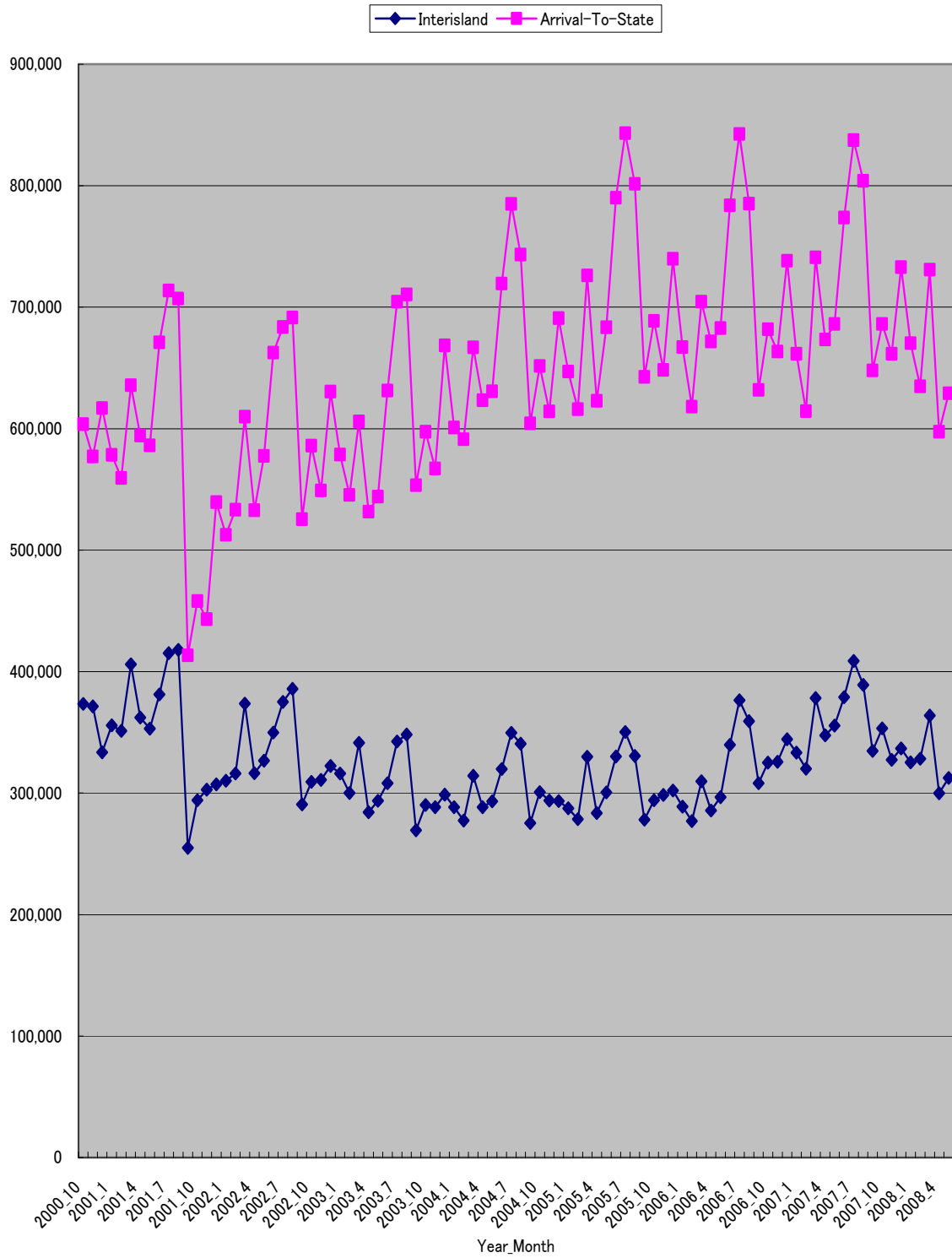


Table 1. Summary Statistics: October 2000 - May 2008

Variables	Mean	Standard Deviation	Min.	Max.
ISLAND	325,823.1	36,201.3	254,991	417,803
April 2008	0.011	0.104	0	1
May 2008	0.011	0.104	0	1
Pre-911	0.120	0.326	0	1
VISITOR	648,376.1	86,145.6	413,254	843,064
FARE	140.2	13.1	118.81	170.87

Table 2. Determinants of Interisland Passenger Number: 2SLS Estimates

	I	II	III
April 2008	5.610 x 10 ³ (0.29)	-38.713 x 10 ³ (0.30)	-17.269 x 10 ³ (0.28)
May 2008	10.274 x 10 ³ (0.54)	-36.597 x 10 ³ (0.29)	-15.116 x 10 ³ (0.25)
Pre_911	42.354 x 10 ³ *** (5.58)	28.436 x 10 ³ * (1.78)	32.671 x 10 ³ (1.64)
VISITOR	0.059 * (1.67)	0.333 *** (3.01)	0.275 * (1.89)
FARE	-5.182 x 10 ³ *** (2.69)	2.676 x 10 ³ (0.23)	1.088 x 10 ³ (0.17)
Month Dummies	YES	NO	YES
Year Dummies	NO	YES	YES
Adjusted R-squared	0.760	0.740	0.862
F-statistic	17.21	23.38	25.30
(P-value	0.000	0.000	0.000)
No. of Obs.	92	92	92

Note: In parentheses are t-statistics. *** and * indicate statistical significance at the 1% and 10% level. Coefficients of month/year dummies are not reported for brevity.

Table 3. ARMA Regressions Results for Daily Arrival to Hawaii

	I	II
Day 1 (April 1)	674.067 (0.18)	
Day 2 (April 2)	- 455.302 (0.11)	
Day 3 (April 3)	- 207.977 (0.05)	
Day 4 (April 4)	-2456.190 (0.66)	
Day 5 (April 5)	-1198.173 (0.36)	
Day 6 (April 6)	213.653 (0.08)	
Day 7 (April 7)	968.003 (0.49)	
Week 1 (April 1-7)		-396.725 (0.19)
Week 2 (April 8-14)		-2036.503 (0.45)
Week 3 (April 15-21)		-2135.345 (0.54)
Week 4 (April 22-28)		-2121.419 (0.43)
Week 5 (April 29- May 5)		-1497.058 (0.38)
Week 6 (May 6-12)		-2449.375 (0.48)
Week 7 (May 13-19)		-2038.960 (0.49)
Week 8 (May 20-26)		-1278.662 (0.23)
AR (1)	0.908*** (110.30)	0.908*** (110.18)
MA (1)	-0.136*** (7.79)	-0.137*** (7.82)
Log Likelihood	-31184.09	-31184.92

Note: Coefficients for dummy variables for individual years, months, days of the week, as well as closure of airports in September 2001 (11th-13th) are also estimated, but not reported for brevity. They are available from the author upon request. In parentheses are z-statistics. *** indicates statistical significance at the 1% level.

Table 4. Impact of Aloha Exit on Airfare in Hawaii: Fixed Effects Analysis

	I (Quarterly Change)	II (Annual Change)

[Aloha Exit]		
2008_Q2	14.948*** (9.17)	22.833*** (8.97)
2008_Q3	2.210 (1.30)	20.421*** (8.02)
2008_Q4	-6.706***(4.12)	17.448*** (6.85)
2009_Q1	-1.869 (1.15)	6.172** (2.42)
2009_Q2	-5.752***(3.53)	-11.768*** (4.62)
[Antitrust Immunity]		
2003_Q1	3.963** (2.45)	7.481*** (2.94)
2003_Q2	8.608*** (5.28)	13.578*** (5.33)
2003_Q3	2.641 (1.62)	13.292*** (5.22)
2003_Q4	-0.533 (0.33)	15.776*** (6.20)
2004_Q1	2.806* (1.72)	14.270*** (5.61)
[Entry]		
2006_Q3	-6.737*** (4.13)	-21.705*** (8.53)
2006_Q4	-6.427*** (3.94)	-21.663*** (8.51)
2007_Q1	-2.394 (1.47)	-22.102*** (8.68)
2007_Q2	0.951 (0.58)	-14.344*** (5.63)
2007_Q3	4.673***(2.87)	-3.924 (1.54)
Adjusted R-squared	0.452	0.547
F-statistic	55.23	79.48
(P-value	0.000	0.000)
No. of Observations	5015 (85 x 59)	4760 (85 x 56)

Note: Coefficients for dummy variables for individual quarters (1995_Q3 - 2009_Q4 in I, and 1996_Q2 - 2009_Q4 in II) are also estimated, but not reported for brevity. They are available from the author upon request. In parentheses are t-statistics. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level.