Appendix: "Incumbent Response to Entry by Low-Cost Carriers in the U.S. Airline Industry"

Kerry M. Tan

1 Replication of Gerardi and Shapiro (2009)

Gerardi and Shapiro (2009) use a two-way fixed effects regression method to find that price dispersion is smaller on more competitive routes as defined by the route-level Herfindahl Index. Although I focus on the increased competition that arises from entry by low-cost carriers, I want to ensure that the data used in the paper can replicate the results in Gerardi and Shapiro (2009). As such, I use my data to estimate the regression specification in their paper:

$$y_{ijt} = \alpha + \beta \times Competition_{jt} + \theta \times X_{it} + \gamma_t + \nu_{ij} + \upsilon_{ijt},$$

where i denotes airline, j denotes route, and t denotes the year-quarter time period. The dependent variable, y_{ijt}, is either G_{ijt}^{lodd}, the log-odds ratio of the Gini coefficient, or $lnP(k)_{ijt}$, the natural log of the 10th percentile airfare if $k = 10$ or the 90th percentile airfare if $k = 90$.[1] Year-quarter and carrier-route fixed effects are denoted as γ_t and ν_{ij}, respectively. X_{it} is an indicator variable for whether airline i is bankrupt in time t. Finally, Gerardi and Shapiro (2009) use three different measures for competition: (1) $-lnHERF_{jt}$, the negative value of the natural log of route-level Herfindahl Index, (2) lnN_{jt}, the natural log of the total number of competitors, and (3) N_{jt}^{LEG}, the number of legacy carriers, and N_{jt}^{LCC}, the number of low-cost carriers servicing a route.

Table 1 in this Appendix presents the regression results reported in Gerardi and Shapiro (2009), as well as the regression results using the data set for the paper. The values for column (1) can be found in Table 2 of Gerardi and Shapiro (2009), whereas the values for column (2) and (3) can be found in Table 3 of their paper. The estimated coefficients for the three competition variables using the data set in the paper are qualitatively similar to the estimates from Gerardi and Shapiro (2009) for each of the three dependent variables. Indeed, increased competition leads to lower price dispersion.

[1] The regression specification using G_{ijt}^{lodd} is Equation (1) in Gerardi and Shapiro (2009), whereas $lnP(k)_{ijt}$ is the dependent variable in Equation (2) in Gerardi and Shapiro (2009).

I elect to use the the negative value of the natural log of route-level Herfindahl Index in the estimation strategy in the paper since this is also the key variable of interest in Borenstein and Rose (1994). In order to check whether the results in the paper are qualitatively similar when including either of the two other competition measures used in Gerardi and Shapiro (2009), I re-run the regression model specified in Equation (1) in Section 4 of the paper replacing the $-lnHERF$ variable with either the natural log of the total number of competitors (lnN) or a combination of the number of legacy carriers (N^{LEG}) and the number of low-cost carriers (N^{LCC}) servicing a route for all dependent variables. Figures 1 and 4 in this Appendix illustrate that incumbent airlines decrease their 10th percentile airfare, mean airfare, and 90th percentile airfare in response to entry by low-cost carriers using lnN or a combination of N^{LEG} and N^{LCC}, respectively. Moreover, Figures 2 and 5 in this Appendix show that price dispersion, as measured by the Gini coefficient, generally decreases once low-cost carriers enters a route while controlling for concentration using lnN or a combination of N^{LEG} and N^{LCC}, respectively, which is further supported by the associated figures for standard deviation (Figures 3 and 6 in this Appendix). Thus, the key results of the paper are robust to either of the three competition variables used in Gerardi and Shapiro (2009).

Sutton (1991) examines the competitive effect of advertising when considered as either an exogenous or endogenous sunk cost. Although the paper does not take airlines' advertising decisions into consideration, Sutton's key points on the relationship between concentration, entry, and the toughness of price competition relates to the paper. Namely, Sutton questions whether stronger price competition exists in less concentrated industries as predicted by theoretical industrial organization models. To that extent, the results of the paper show that airfares are generally lower on routes that are less concentrated. Moreover, the results are robust using three different competition measures: (1) the negative value of the natural log of route-level Herfindahl Index, (2) the natural log of the total number of competitors, and (3) the number of legacy carriers and the number of low-cost carriers servicing a route. Thus, the key results presented in the paper relate to Sutton's work in the sense that an increase to route-level concentration leads to tougher price competition in the form of lower airfares.

2 Alternative Entry Window Specification

The estimation strategy in the paper includes nine time dummies that account for four quarters before actual entry to four quarters after actual entry, including the actual quarter of entry. This time window is selected since low-cost carriers publicly announce their entry decisions typically two quarters in advance. An alternative entry window specification of three time dummies (one quarter before entry, the quarter of entry, and the quarter after entry) would investigate the immediate response by legacy carrier incumbents to low-cost carrier entry and serves as a robustness check. Table 2 in this Appendix summarizes the estimates for a modified regression equation that includes three $Entry$ time dummies instead of nine. These estimates are then log transformed to create price paths as discussed in Section 4 of the paper. The estimates of the time lags/forwards of entry show the relative sizes of the dependent variable in the dummy time period versus its average value in the modified excluded period (modified to be the second to sixth quarters before entry).

The main results of the paper is that legacy carrier incumbents respond to entry by low-cost carriers by decreasing their 10th percentile airfare by a smaller percentage than mean airfares, while decreasing their 90th percentile airfare by a larger percent than mean airfares. As such, the price distribution becomes more compressed, resulting in less price dispersion. Indeed, the same results apply when implementing the alternative entry window specification. Figure 7 in this Appendix shows that not only do legacy carrier incumbents decrease their 10th percentile airfare, mean airfare, and 90th percentile airfare in response to entry by a low-cost carrier, but that legacy carrier incumbents also decrease their 90th percentile airfare by more than their mean airfare, which in turn decreases by more than their 10th percentile prices. Moreover, Figures 8 and 9 in this Appendix illustrates that both the Gini coefficient and standard deviation for legacy carrier incumbent's airfares decrease in response to entry by a low-cost carrier. Therefore, price dispersion generally decreases once legacy carrier incumbents face stronger competition in the form of entry by low-cost carriers, which is qualitatively similar to the key results presented in Section 4 of the paper.

3 Pooled Low-Cost Carrier Entry

The existing literature focuses on the entry effects of Southwest Airlines and finds that incumbents reduce their price in response to entry by Southwest Airlines. As such, the results in Section 4 of the paper that shows that legacy carrier incumbents respond to entry by Southwest Airlines by decreasing their mean airfare is not surprising. However, entry by other low-cost airlines has dramatically expanded their route network and their prominence in the airline industry. The results in Section 4 of the paper examine the airline-specific entry effects and implies that the so-called Southwest Effect should not be considered as just a special case relevant to one specific airline. Rather, the entry effect pertains to low-cost carriers in general. To make this point more credible, I pool across all low-cost carriers and analyze the incumbent response to entry by all low-cost carriers.

Figure 10 in this Appendix includes the price paths for the incumbent response to entry by all low-cost carriers for each of the five dependent variables discussed in the paper. Consistent with the key results presented in Section 4 of the paper, legacy carrier incumbents decrease their mean airfare, 10th percentile airfare, and 90th percentile airfare following entry by any low-cost carrier. Airfares decrease by a larger percentage at the right tail of the incumbents' price distribution than at the left tail, suggesting that increased competition from low-cost carrier entrants leads to lower price dispersion as measured by either the Gini coefficient or the standard deviation of airfares. By pooling the low-cost carriers together, I am able to show that the strong entry effect attributed to Southwest Airlines in the existing literature applies to all low-cost carriers combined as well. This provides evidence that the so-called Southwest Effect can be more broadly described as a Low-Cost Carrier Effect.

4 Removal of Concentration and Bankruptcy Variables

The main regression specification (Equation (1) presented in Section 4 of the paper) implements route-carrier and year-quarter fixed effects to control for unobserved heterogeneity. In order to confirm that the inclusion of the concentration and bankruptcy variables does not introduce a subtle bias as discussed in Gormley and Matsa (2014), I run the regression specification for *lnprice* omitting these two control variables. Table 3 in this Appendix presents the results for low-cost carrier entrants with and without using the concentration and bankruptcy variables. Columns 1, 3, 5, and 7 in Table 3 in this Appendix are the same results as Columns 1, 2, 3, and 4 in Table 2 in the paper, respectively, which provides the main results for average airfares discussed in Section 4 of the paper. The regression results for the entry variables for each of the four low-cost carrier entrants are qualitatively similar when omitting the two control variables, which addresses the concern that the inclusion of the concentration and bankruptcy variables produce inconsistent estimates.

5 Two-Way Cluster Robust Standard Errors

The estimation strategy in the paper clusters standard errors by carrier-route in order to account for heteroskedasticity and for correlation between a carrier-route combination over time. This assumes that time series shocks are the same across carrier-routes. However, clustering by both carrier-route and year-quarter would be necessary if the within-year clustering arises from shocks that are not the same across all carrier-routes in a given year-quarter. In order to check for the robustness of only clustering by carrier-route, I run the regression for *lnprice* as specified in Equation (1) while clustering the standard errors by both carrier-route and year-quarter. Table 4 in this Appendix presents the results for low-cost carrier entrants when standard errors are clustered only by carrier-route and also when they are clustered by both carrier-route and year-quarter. Columns 1, 3, 5, and 7 in Table 4 in this Appendix are the same results as Columns 1, 2, 3, and 4 in Table 2 in the paper, respectively, which provides the main results for average airfares discussed in Section 4 of the paper. To be sure, double clustering leads to the same regression estimates as clustering by one variable, but does lead to different standard errors by construction. The regression results when using two-way cluster robust standard errors are qualitatively similar to the main results presented in Section 4 of the paper.

Table 1: Replication of Key Results in Gerardi and Shapiro (2009)

	Gerardi/Shapiro (2009)			the paper		
	(1)	(2)	(3)	(4)	(5)	(6)
			Dependent Variable: $lnPrice$			
$-lnHERF$	-0.121^{**}			-0.060^{**}		
	(0.022)			(0.002)		
lnN		-0.177^{**}			-0.055^{**}	
		(0.029)			(0.002)	
N^{LEG}			-0.005			-0.007^{**}
			(0.004)			(0.001)
N^{LCC}			-0.056^{**}			-0.054^{**}
			(0.007)			(0.002)
			Dependent Variable: $lnP10$			
$-lnHERF$	-0.166^{**}			-0.055^{**}		
	(0.027)			(0.001)		
lnN		-0.273^{**}			-0.088^{**}	
		(0.039)			(0.001)	
N^{LEG}			-0.025^{**}			-0.019^{**}
			(0.004)			(0.001)
N^{LCC}			-0.054^{**}			-0.102^{**}
			(0.007)			(0.001)
			Dependent Variable: $lnP90$			
$-lnHERF$	-0.406^{**}			-0.121^{**}		
	(0.041)			(0.002)		
lnN		-0.652^{**}			-0.159^{**}	
		(0.067)			(0.002)	
N^{LEG}			-0.041^{**}			-0.031^{**}
			(0.005)			(0.001)
N^{LCC}			-0.156^{**}			-0.166^{**}
			(0.014)			(0.002)

Note: This table compares the key results presented in Gerardi and Shapiro (2009) with the replication results using the data for the paper. The values for column (1) can be found in Table 2 of Gerardi and Shapiro (2009), whereas the values for column (2) and (3) can be found in Table 3 of that paper.
* indicates significance at 5% level.
** indicates significance at 1% level.

Table 2: Incumbent Price Response to Entry (Alternative Window)

	(1)	(2)	(3)	(4)
Entrant:	AirTran Airways	JetBlue Airways	Southwest Airlines	Spirit Airlines
		Dependent Variable: $lnPrice$		
$Entry_{t_0-1}$	-0.007^{*}	0.003	-0.004	-0.056^{**}
	(0.003)	(0.006)	(0.003)	(0.011)
$Entry_{t_0}$	-0.059^{**}	-0.057^{**}	-0.113^{**}	-0.024
	(0.003)	(0.006)	(0.003)	(0.013)
$Entry_{t_0+1}$	-0.091^{**}	-0.090^{**}	-0.163^{**}	-0.064^{**}
	(0.004)	(0.006)	(0.004)	(0.015)
		Dependent Variable: $lnP10$		
$Entry_{t_0-1}$	-0.011^{**}	-0.004	-0.007^{*}	-0.041^{**}
	(0.003)	(0.007)	(0.003)	(0.012)
$Entry_{t_0}$	-0.036^{**}	-0.053^{**}	-0.089^{**}	-0.022^{*}
	(0.003)	(0.007)	(0.003)	(0.011)
$Entry_{t_0+1}$	-0.050^{**}	-0.072^{**}	-0.116^{**}	-0.051^{**}
	(0.003)	(0.006)	(0.004)	(0.013)
		Dependent Variable: $lnP90$		
$Entry_{t_0-1}$	-0.006	0.004	0.003	-0.035
	(0.005)	(0.009)	(0.005)	(0.019)
$Entry_{t_0}$	-0.061^{**}	-0.048^{**}	-0.131^{**}	-0.009
	(0.005)	(0.010)	(0.006)	(0.022)
$Entry_{t_0+1}$	-0.099^{**}	-0.103^{**}	-0.201^{**}	-0.067^{**}
	(0.005)	(0.010)	(0.006)	(0.026)
		Dependent Variable: $loddGini$		
$Entry_{t_0-1}$	0.018^{**}	0.006	0.007	0.011
	(0.005)	(0.010)	(0.005)	(0.017)
$Entry_{t_0}$	-0.001	0.008	-0.006	0.012
	(0.005)	(0.011)	(0.006)	(0.019)
$Entry_{t_0+1}$	-0.025^{**}	-0.006	-0.034^{**}	-0.005
	(0.006)	(0.012)	(0.006)	(0.022)
		Dependent Variable: $lnSD$		
$Entry_{t_0-1}$	0.011^{*}	0.009	0.003	-0.037
	(0.006)	(0.012)	(0.006)	(0.020)
$Entry_{t_0}$	-0.045^{**}	-0.037^{**}	-0.094^{**}	-0.017
	(0.006)	(0.012)	(0.007)	(0.023)
$Entry_{t_0+1}$	-0.090^{**}	-0.073^{**}	-0.144^{**}	-0.041
	(0.007)	(0.014)	(0.007)	(0.024)

Note: This table presents the results for the two-way fixed effects regression of the five dependent variables used in Tables 2 - 6 in the paper that implement an alternative window specification which includes a more limited set of $entry$ variables are the lagged/forward time dummies, where $Entry_{t_0}$ is the quarter of entry. Observations are at the carrier-route-year-quarter level. Constant term, carrier-route fixed effects, year-quarter fixed effects, as well as $-lnHERF$ and *Bankrupt* variables, suppressed. Standard errors, which are clustered by carrier-route, are reported in parentheses.
* indicates significance at 5% level.
** indicates significance at 1% level.

Table 3: Removal of Concentration and Bankruptcy Variables
(Dependent Variable: *lnPrice*)

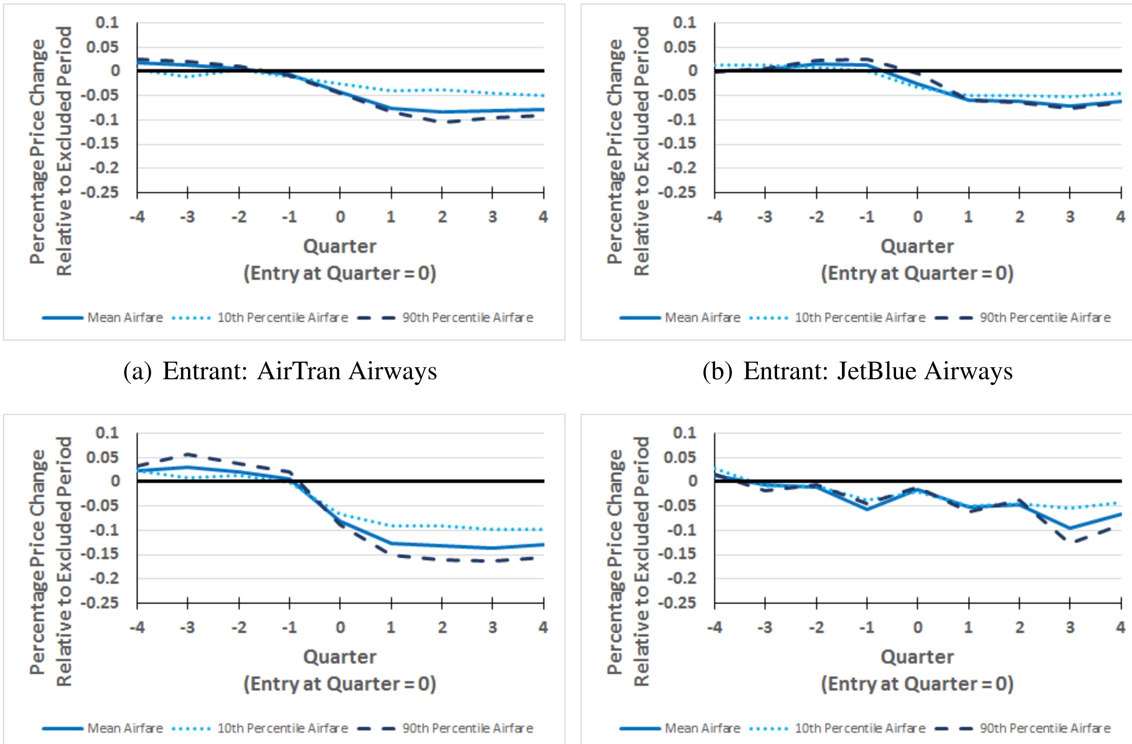
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Entrant:	AirTran Airways		JetBlue Airways		Southwest Airlines		Spirit Airlines	
$-lnHERF$	-0.092^{**}		-0.093^{**}		-0.092^{**}		-0.093^{**}	
	(0.001)		(0.001)		(0.001)		(0.001)	
$Bankrupt$	-0.026^{**}		-0.026^{**}		-0.025^{**}		-0.027^{**}	
	(0.001)		(0.001)		(0.001)		(0.001)	
$Entry_{t_0-4}$	0.026^{**}	0.031^{**}	-0.020^{**}	-0.006	0.017^{**}	0.067^{**}	0.005	0.041^{**}
	(0.003)	(0.003)	(0.006)	(0.006)	(0.003)	(0.003)	(0.011)	(0.011)
$Entry_{t_0-3}$	0.018^{**}	0.024^{**}	-0.019^{**}	-0.003	0.024^{**}	0.074^{**}	-0.009	0.027^{*}
	(0.003)	(0.003)	(0.007)	(0.006)	(0.003)	(0.004)	(0.011)	(0.011)
$Entry_{t_0-2}$	0.012^{**}	0.019^{**}	-0.007	0.011	0.014^{**}	0.064^{**}	-0.017	0.023
	(0.003)	(0.003)	(0.006)	(0.006)	(0.003)	(0.003)	(0.012)	(0.012)
$Entry_{t_0-1}$	0.000	0.005	-0.006	0.011	-0.001	0.048^{**}	-0.059^{**}	-0.023
	(0.003)	(0.003)	(0.007)	(0.006)	(0.003)	(0.003)	(0.013)	(0.012)
$Entry_{t_0}$	-0.052^{**}	-0.054^{**}	-0.066^{**}	-0.058^{**}	-0.109^{**}	-0.065^{**}	-0.027	0.003
	(0.004)	(0.003)	(0.007)	(0.006)	(0.004)	(0.003)	(0.015)	(0.012)
$Entry_{t_0+1}$	-0.084^{**}	-0.087^{**}	-0.100^{**}	-0.091^{**}	-0.159^{**}	-0.117^{**}	-0.067^{**}	-0.034^{*}
	(0.004)	(0.003)	(0.007)	(0.006)	(0.004)	(0.003)	(0.017)	(0.014)
$Entry_{t_0+2}$	-0.091^{**}	-0.093^{**}	-0.101^{**}	-0.095^{**}	-0.163^{**}	-0.121^{**}	-0.057^{**}	-0.025
	(0.004)	(0.003)	(0.007)	(0.006)	(0.004)	(0.003)	(0.018)	(0.015)
$Entry_{t_0+3}$	-0.090^{**}	-0.094^{**}	-0.109^{**}	-0.104^{**}	-0.170^{**}	-0.128^{**}	-0.104^{**}	-0.077^{**}
	(0.004)	(0.003)	(0.008)	(0.006)	(0.004)	(0.003)	(0.019)	(0.015)
$Entry_{t_0+4}$	-0.087^{**}	-0.090^{**}	-0.103^{**}	-0.096^{**}	-0.161^{**}	-0.117^{**}	-0.078^{**}	-0.050^{**}
	(0.004)	(0.003)	(0.007)	(0.005)	(0.004)	(0.003)	(0.018)	(0.013)
N	2,008,446	2,008,446	2,008,446	2,008,446	2,008,446	2,008,446	2,008,446	2,008,446

Note: This table presents the results for the two-way fixed effects regression of the natural log of legacy carrier incumbent's mean airfare in response to entry by four low-cost carriers. The *entry* variables are the lagged/forward time dummies, where $Entry_{t_0}$ is the quarter of entry. Observations are at the carrier-route-year-quarter level. Constant term, carrier-route fixed effects, and year-quarter fixed effects suppressed. Standard errors, which are clustered by carrier-route, are reported in parentheses.
* indicates significance at 5% level.
** indicates significance at 1% level.

Table 4: Two-Way Cluster Robust Standard Errors
(Dependent Variable: *lnPrice*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Entrant:	AirTran Airways		JetBlue Airways		Southwest Airlines		Spirit Airlines	
$-lnHERF$	-0.092^{**}	-0.092^{**}	-0.093^{**}	-0.093^{**}	-0.092^{**}	-0.092^{**}	-0.093^{**}	-0.093^{**}
	(0.001)	(0.005)	(0.001)	(0.005)	(0.001)	(0.005)	(0.001)	(0.005)
$Bankrupt$	-0.026^{**}	-0.026^{**}	-0.026^{**}	-0.026^{**}	-0.025^{**}	-0.025^{**}	-0.027^{**}	-0.027^{**}
	(0.001)	(0.005)	(0.001)	(0.005)	(0.001)	(0.005)	(0.001)	(0.005)
$Entry_{t_0-4}$	0.026^{**}	0.026^{*}	-0.020^{**}	-0.020	0.017^{**}	0.017	0.005	0.005
	(0.003)	(0.011)	(0.006)	(0.014)	(0.003)	(0.018)	(0.011)	(0.019)
$Entry_{t_0-3}$	0.018^{**}	0.018	-0.019^{**}	-0.019	0.024^{**}	0.024	-0.009	-0.009
	(0.003)	(0.012)	(0.007)	(0.014)	(0.003)	(0.018)	(0.011)	(0.017)
$Entry_{t_0-2}$	0.012^{**}	0.012	-0.007	-0.007	0.014^{**}	0.014	-0.017	-0.017
	(0.003)	(0.012)	(0.006)	(0.012)	(0.003)	(0.016)	(0.012)	(0.021)
$Entry_{t_0-1}$	0.000	0.000	-0.006	-0.006	-0.001	-0.001	-0.059^{**}	-0.059^{**}
	(0.003)	(0.013)	(0.007)	(0.016)	(0.003)	(0.016)	(0.013)	(0.021)
$Entry_{t_0}$	-0.052^{**}	-0.052^{**}	-0.066^{**}	-0.066^{**}	-0.109^{**}	-0.109^{**}	-0.027	-0.027
	(0.004)	(0.012)	(0.007)	(0.016)	(0.004)	(0.013)	(0.015)	(0.029)
$Entry_{t_0+1}$	-0.084^{**}	-0.084^{**}	-0.100^{**}	-0.100^{**}	-0.159^{**}	-0.159^{**}	-0.067^{**}	-0.067
	(0.004)	(0.010)	(0.007)	(0.018)	(0.004)	(0.016)	(0.017)	(0.042)
$Entry_{t_0+2}$	-0.091^{**}	-0.091^{**}	-0.101^{**}	-0.101^{**}	-0.163^{**}	-0.163^{**}	-0.057^{**}	-0.057
	(0.004)	(0.009)	(0.007)	(0.021)	(0.004)	(0.014)	(0.018)	(0.040)
$Entry_{t_0+3}$	-0.090^{**}	-0.090^{**}	-0.109^{**}	-0.109^{**}	-0.170^{**}	-0.170^{**}	-0.104^{**}	-0.104^{**}
	(0.004)	(0.010)	(0.008)	(0.019)	(0.004)	(0.015)	(0.019)	(0.036)
$Entry_{t_0+4}$	-0.087^{**}	-0.087^{**}	-0.103^{**}	-0.103^{**}	-0.161^{**}	-0.161^{**}	-0.078^{**}	-0.078^{*}
	(0.004)	(0.013)	(0.007)	(0.015)	(0.004)	(0.015)	(0.018)	(0.033)
Cluster by carrier-route	X	X	X	X	X	X	X	X
Cluster by year-quarter		X		X		X		X
N	2,008,446	2,008,446	2,008,446	2,008,446	2,008,446	2,008,446	2,008,446	2,008,446

Note: This table presents the results for the two-way fixed effects regression of the natural log of legacy carrier incumbent's mean airfare in response to entry by four low-cost carriers. The *entry* variables are the lagged/forward time dummies, where $Entry_{t_0}$ is the quarter of entry. Observations are at the carrier-route-year-quarter level. Constant term, carrier-route fixed effects, and year-quarter fixed effects suppressed. Standard errors are reported in parentheses.
* indicates significance at 5% level.
** indicates significance at 1% level.



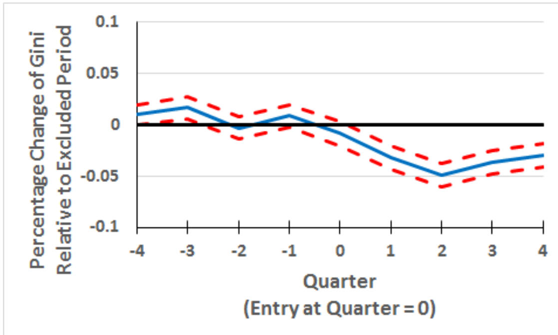
(a) Entrant: AirTran Airways

(b) Entrant: JetBlue Airways

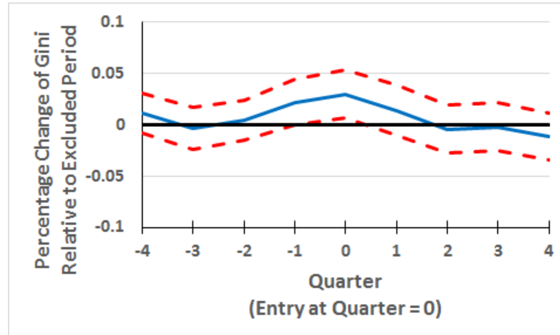
(c) Entrant: Southwest Airlines

(d) Entrant: Spirit Airlines

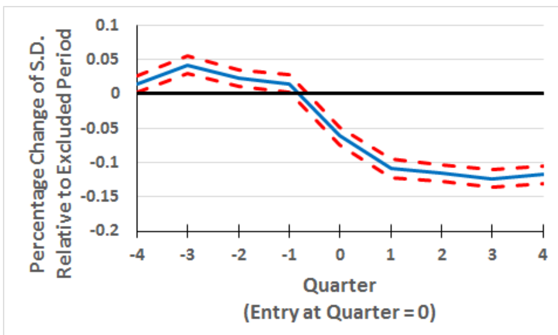
Figure 1: Mean, 10th Percentile, and 90th Percentile Airfares (Competition Variable: *lnN*)



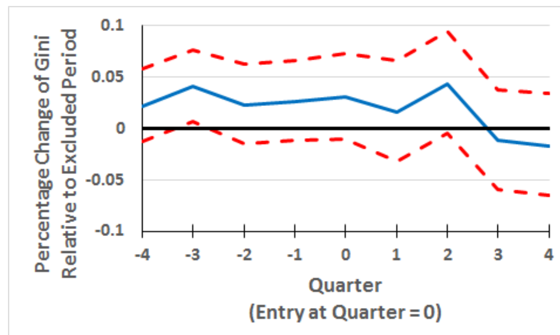
(a) Entrant: AirTran Airways



(b) Entrant: JetBlue Airways

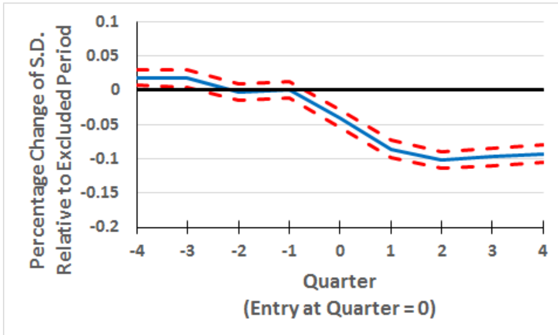


(c) Entrant: Southwest Airlines

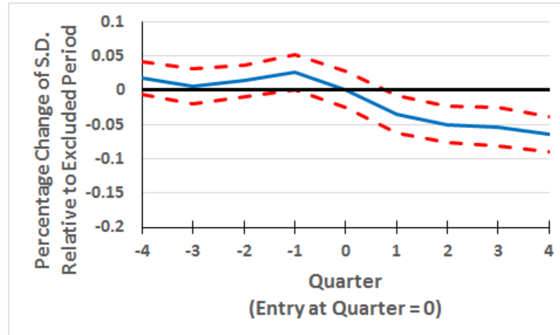


(d) Entrant: Spirit Airlines

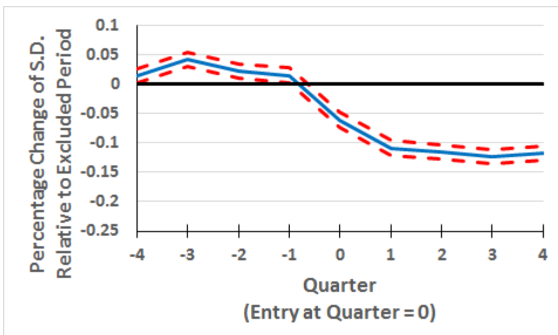
Figure 2: Gini Coefficient (Competition Variable: *lnN*)



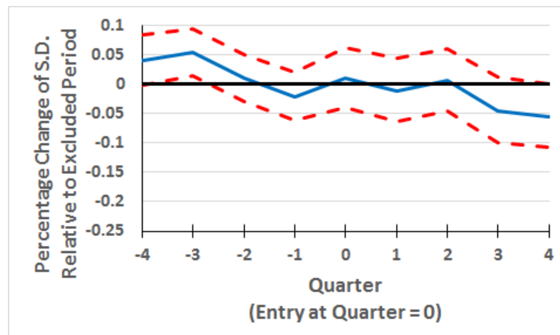
(a) Entrant: AirTran Airways



(b) Entrant: JetBlue Airways

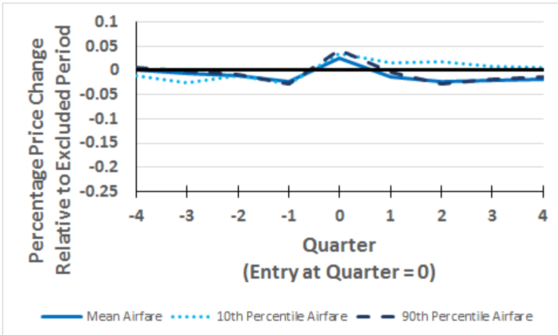


(c) Entrant: Southwest Airlines

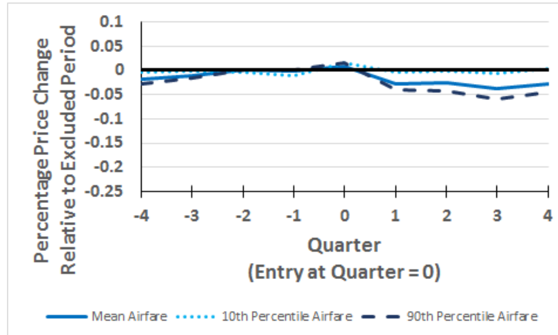


(d) Entrant: Spirit Airlines

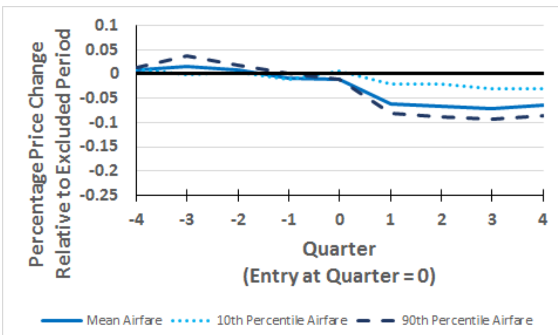
Figure 3: Standard Deviation (Competition Variable: *lnN*)



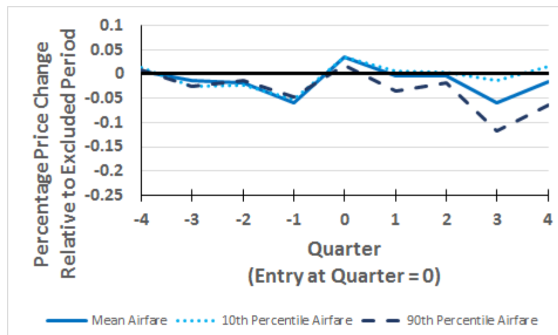
(a) Entrant: AirTran Airways



(b) Entrant: JetBlue Airways

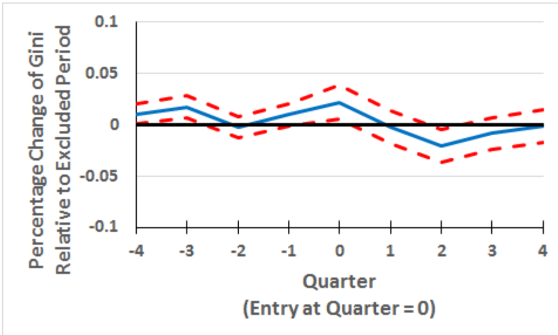


(c) Entrant: Southwest Airlines

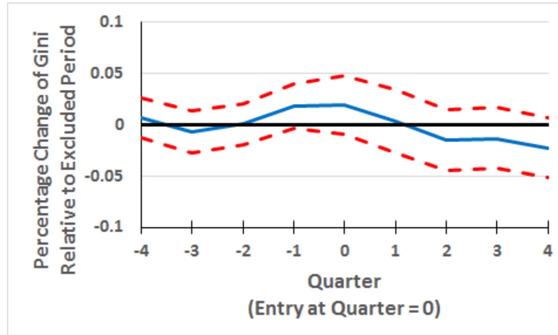


(d) Entrant: Spirit Airlines

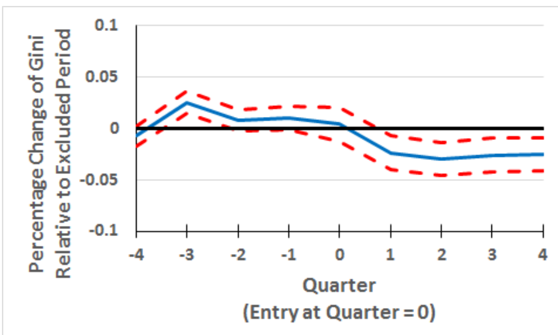
Figure 4: Mean, 10th Percentile, and 90th Percentile Airfares (Competition Variable: $nLEG$ and $nLCC$)



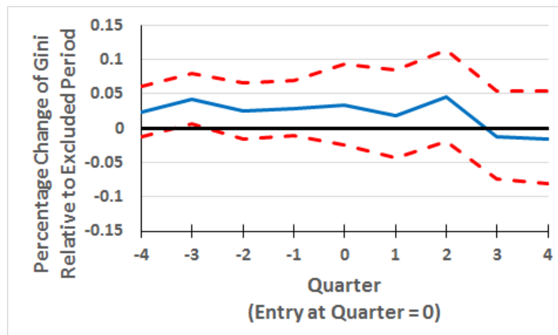
(a) Entrant: AirTran Airways



(b) Entrant: JetBlue Airways

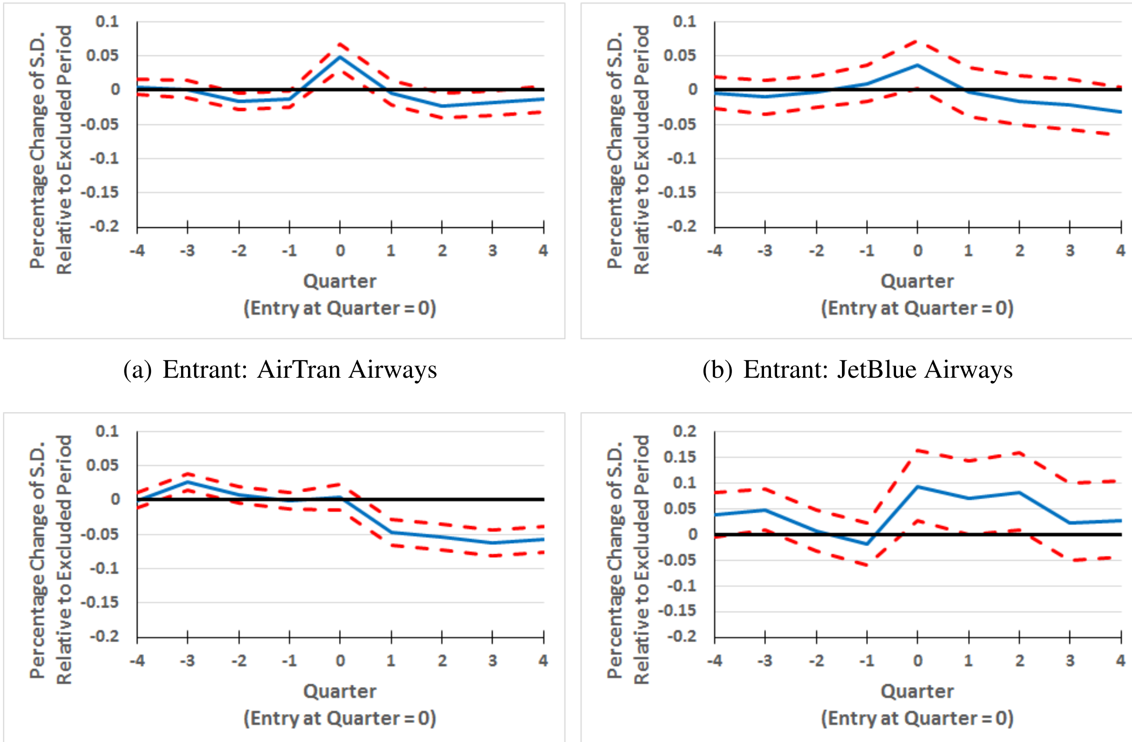


(c) Entrant: Southwest Airlines



(d) Entrant: Spirit Airlines

Figure 5: Gini Coefficient (Competition Variable: *nLEG* and *nLCC*)



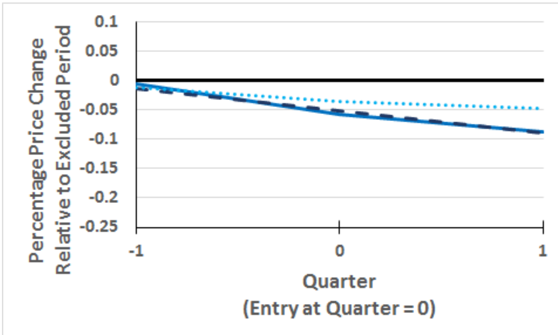
(a) Entrant: AirTran Airways

(b) Entrant: JetBlue Airways

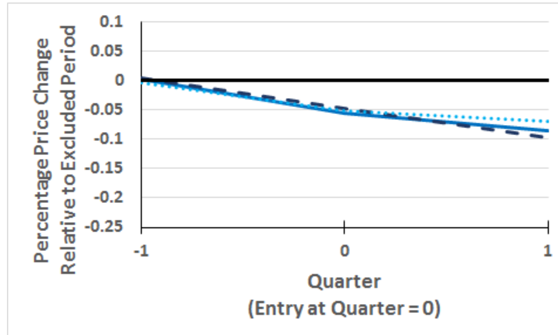
(c) Entrant: Southwest Airlines

(d) Entrant: Spirit Airlines

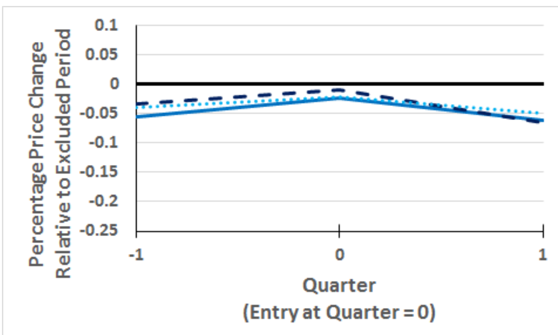
Figure 6: Standard Deviation (Competition Variable: *nLEG* and *nLCC*)



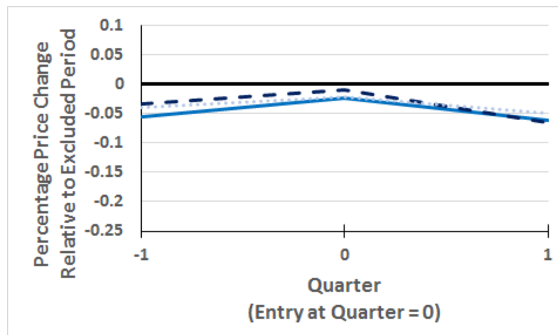
(a) Entrant: AirTran Airways



(b) Entrant: JetBlue Airways

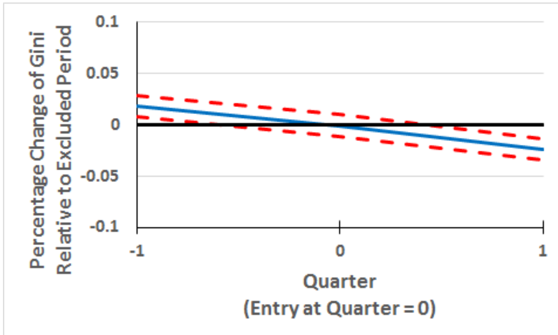


(c) Entrant: Southwest Airlines

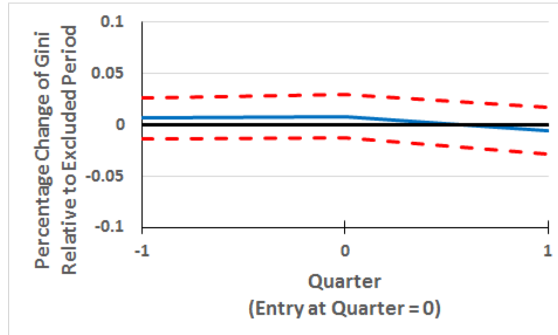


(d) Entrant: Spirit Airlines

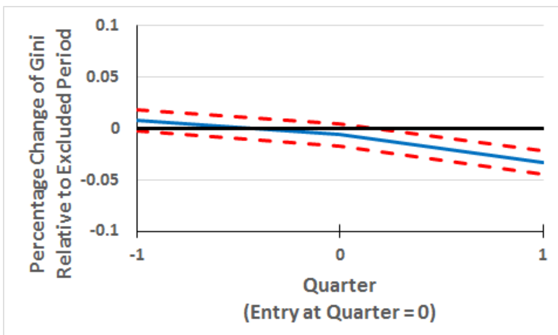
Figure 7: Mean, 10th Percentile, and 90th Percentile Airfares (Alternative Window)



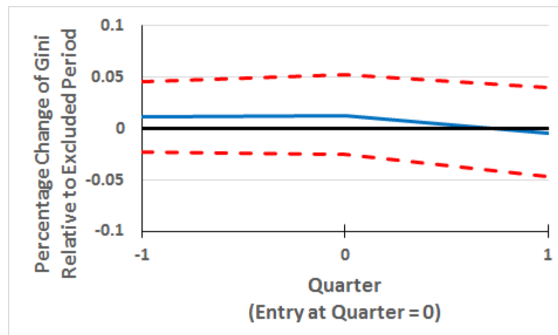
(a) Entrant: AirTran Airways



(b) Entrant: JetBlue Airways

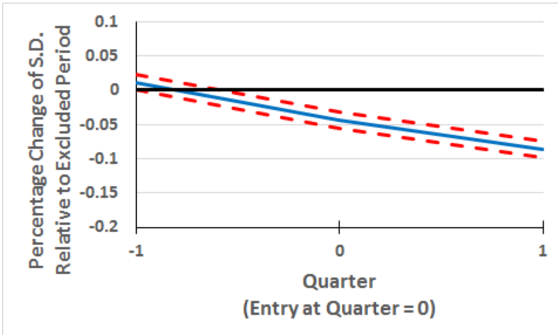


(c) Entrant: Southwest Airlines

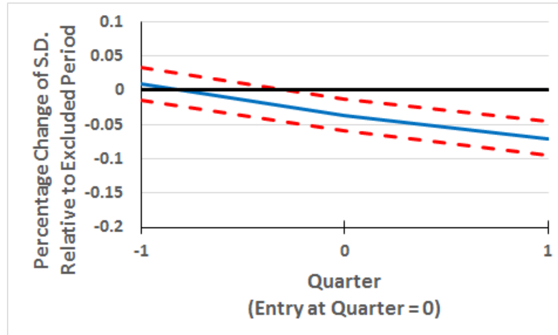


(d) Entrant: Spirit Airlines

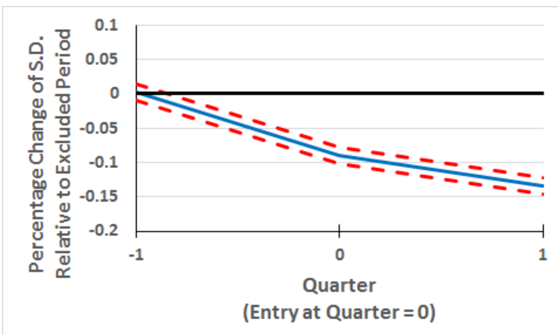
Figure 8: Gini Coefficient (Alternative Window)



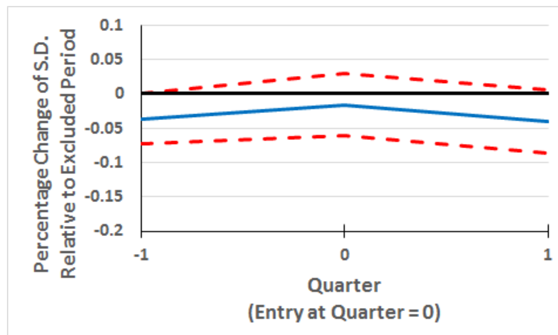
(a) Entrant: AirTran Airways



(b) Entrant: JetBlue Airways

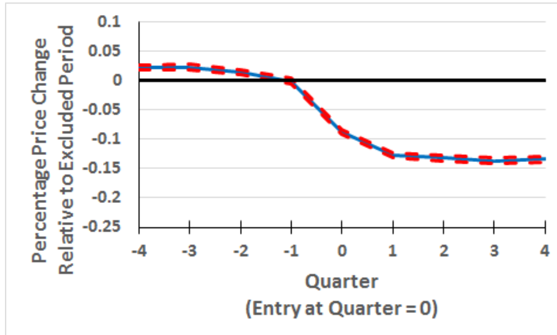


(c) Entrant: Southwest Airlines

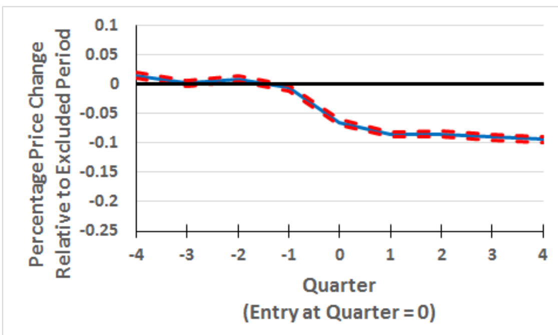


(d) Entrant: Spirit Airlines

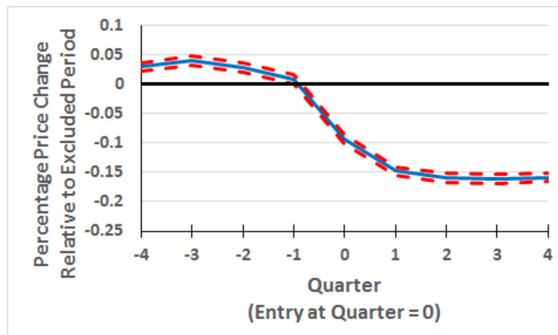
Figure 9: Standard Deviation (Alternative Window)



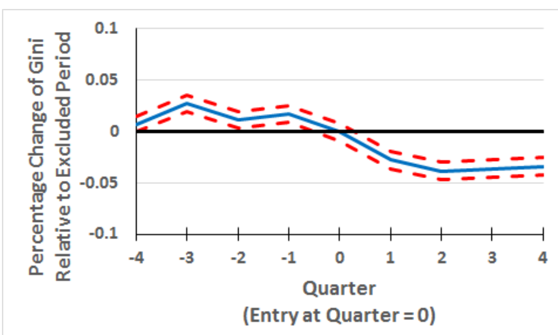
(a) Mean Airfare



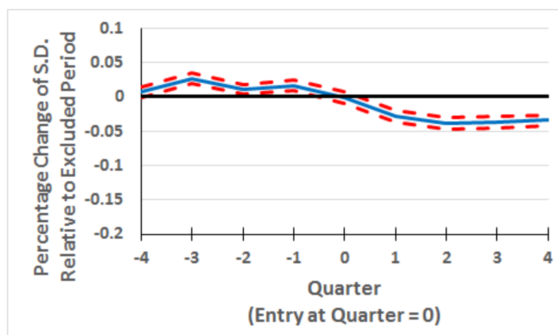
(b) 10th Percentile Airfare



(c) 90th Percentile Airfare



(d) Gini Coefficient



(e) Standard Deviation

Figure 10: Incumbent Response to Entry: Pooled Low-Cost Carriers

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