1 Introduction

A long-standing interest in economics and public policy discussions is the competitive e¤ects of horizontal mergers. To evaluate these e¤ects, one natural approach is to study actual mergers retrospectively. Such studies in the economics literature have focused on a merger's price e¤ects, which are often used to infer relative changes in market power and cost e¢ ciencies associated with the merger (See, for example, Whinston (2006) for a discussion of this literature).[1] However, price

In some of the markets, the …rms did not have pre-merger competition with each other, whereas in others they competed directly, with varying degrees of competition intensity.[3] Therefore, we can examine not only how the overall product quality is a¤ected by a merger, but also how the quality

Our structural demand estimates further allow us to monetize the consumer gains and losses

product quality.[5]

In the rest of the paper, we provide the theoretical motivation in section 2, describe the mergers

Suppose that …rm i can choose

Proposition 1. For given 2 (1=2; 1]; a merger increases product quality when the pre-merger competition intensity is low (i.e., < 2 (1)), but decreases quality when the pre-merger com-

An alternate interpretation of Proposition 1 is that product quality can be higher under either a multiproduct monopoly or duopoly competition, depending on the relative sizes of the coordination and incentive e¤ects. This is related to Chen and Schwartz (2013), who …nd that product innovation incentives can be higher under either monopoly or (duopoly) competition, depending on the balance of what they term as the price coordination and the pro…t diversion e¤ects. Their result is obtained

the United States, with Delta having its primary hub in Atlanta, Georgia and Northwest having

ious papers have analyzed di¤erent aspects of timeliness. The three main quality dimensions of service timeliness analyzed in the literature are: (i) "On-time performance," measured by carrier delay time when servicing a given set of itineraries; (ii) "Schedule delay", which is a gap between a passenger's preferred departure time and actual departure time; and (iii) travel time required to complete a given itinerary in getting the passenger from the origin to destination. Studies in the literature typically measure (i) directly from available data on ‡on

most convenient to get to their destination, so higher values of Routing Quality are associated with

Table

A product is de…ned as an itinerary-operating carrier combination during a particular time period. An example is a direct ‡ight from Dallas to Atlanta operated by American Airlines. We focus on products that use a single operating carrier for all segments of the trip itinerary. Table 2 reports the names and associated code of the carriers in our sample. We recode feeder/regional airlines to their matching major airlines. For example, American Eagle (MQ) operates on a regional airline level, and feeds passengers to American Airlines (AA). Therefore, American Eagle

is recoded to take the code of the major airline to which it feeds passengers for the itinerary under

itineraries across all fare classes.[20] Our price and quantity variables are constructed by averaging

Table 3

Descriptive Statistics

Time period span of data: 2005:Q1 to 2013:Q3

4 The Empirical Model

$g = 0; 1; :::; G$, in which the outside good, $j = 0$, is the only member of group 0.

A passenger solves the following optimization problem:

$$\max_{j \in f0}$$

where S_{jmt} is the observed share of product j computed from data by $S_{jmt} = {}^{q}$

the in ‡uence of demand shocks on the menu of products o¤ered and their non-price characteristics.

Parameters $_9$, $_{10}$ and $_{11}$ are interpreted analogously to $_6$, $_7$ and $_8$, but relate to the CO/UA merger. For example, $_{11}$ tells us if routing quality of products o¤ered by Continental or

instrument produce R-squared values of 0.15 and 0.39 respectively. In addition, the coe¢ cient

5.2 Estimates from Reduced-form Routing Quality Equation

Table 5 reports estimates of the reduced-form routing quality equation. The table provides three columns of coe¢ cient estimates. Coe¢ cient estimates in the …rst column can be thought of as a

Estimates of the constant term across the regression speci…cations are approximately 88.3.

important to control for the determinants of routing quality discussed above. In addition, given

regressions are held at their sample mean for Continental/United products throughout the time span

on

with the DL/NW merger. In fact, Atlanta to Washington, DC; Atlanta to Philadelphia; and Atlanta to San Francisco; are examples of markets in the sample in which E_{bm}^{dn} is greater than

in markets where these two airlines had overlapping services prior to merging. Attributing to the merger the di¤erence-in-di¤erences results in these markets is reinforced by the fact that results in Table 6 suggest that DL and NW products were experiencing a relative increase in routing quality in said markets prior to their merger.

Table 6
Estimation Results for Pre-trends Analysis during Pre-merger periods

	Dependent Variable: *Routing Quality* (in %)

The second column of estimates in Table 6 focus on markets in which DL and NW services do not overlap prior to their merger. Since the coe¢ cient estimate on the Time Trend variable is positive and statistically signi..cant, then we can conclude that routing quality of products o¤ered by airlines other than DL or NW in these markets was increasing prior to the DL/NW merger. The 96(th)-1(e)-296(co)-28(eH

in routing quality of their products in markets where the services of these two airlines did not overlap prior to merging. It is now more di¢ cult to attribute to the merger the relative increase in routing quality of DL/NW products in these markets since the relative pre-post merger increase

convex combination of characteristics of non-merging airlines such that the synthetic airline best

result suggested in Table 5. The ..gure also suggests that the actual decline in routing quality began a couple quarters subsequent to legal implementation of the merger.

Figure 7 illustrates the predicted impact of the CO/UA merger in markets that CO and UA services overlapped prior to them merging. The ..gure suggests that the CO/UA merger is associated with an increase in routing quality of CO/UA products in these markets since the solid line

Figure 7: Trends in Routing Quality of CO/UA and Synthetic Control Unit in markets that CO and UA services overlapped prior to merger.

5.2.7 Summary of Empirical Results that are Consistent with Theoretical Predictions

In summary, much of the empirical results, taken together across both mergers, are consistent with

6 Conclusion

Departing from the extant economics literature on horizontal mergers that focuses on their price e¤ects, this paper has investigated how mergers a¤ect the merging …rms' product quality. Consistent with the theoretical predictions, the empirical analysis of two recent airline mergers …nds evidence suggesting that: (1) each merger is associated with a quality

Appendix

Table A1
Pre-merger comparison on various characteristics between synthetic and merging airlines across markets in which DL and NW services do not overlap prior to merger

	Mean Values	
Variables	Airlines that Merge (DL & NW)	Synthetic Airline
Origin Mandmpa4{o2nd)a708 re W		

Table A2

the US Electric Power Sector," International Journal of Industrial Organization, Vol. 28: 645-656.