THE COMPETITIVE IMPLICATIONS OF A "NO-HAGGLE" PRICING POLICY: THE ACCESS TOYOTA CASE

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Abstract

Although prices in the automobile market are traditionally negotiated, recently, some manufacturers are selling their vehicles at a "no-haggle" or fixed price. In order to understand the impact of such a strategy, we investigate the case of Toyota's fixed price policy, or the "Access Toyota" program, which was introduced in Canada starting 2000. To date, the program has been implemented in all the provinces of the country, except, due to provincial regulations, in Ontario. This creates a natural experiment in which to examine the effect of a fixed price strategy on the prices and sales of a firm and its competitors. Our results suggest that the program had important competitive implications. We find that prices of both Toyota and Honda were higher in provinces with the program, but surprisingly Honda's price differential was comparatively higher than Toyota's. In terms of sales, Toyota's sales were not affected by the introduction of the program, but Honda had higher sales in the provinces with the program than in those without the program, as compared to their sales before the program was introduced. We conclude that this fixed price policy has benefited both firms, but the effect on consumer welfare cannot be conclusively determined.

Keywords: Pricing, competitive analysis, bargaining

1. Introduction

In North America, prices in the automobile market are largely determined through a process of negotiation between a dealer and a consumer. Some sellers, however, have recently attempted to replace the practice of negotiation with a fixed price policy. Manufacturers like Saturn, for example, encourage their dealers to sell their vehicles at a "no-haggle" price so that all consumers coming into the dealership pay the same price. A similar policy has also been initiated by a large number of individual dealerships, who provide consumers with the option of buying a vehicle over the Internet at a fixed price, allowing them to bypass the negotiation process altogether.

While the practice of offering a fixed price Internet option alongside an existing bargaining one has become widespread among dealers, our research focuses on the simpler case where a manufacturer exclusively implements a no-haggle pricing policy among its downstream dealerships, while competitors' prices continue to be determined through bargaining. More specifically, our purpose is to understand the competitive consequences of an exclusive no-haggle pricing policy by examining its impact on a firm's and its competitors' sales and prices.

Our investigation is based on the case of Toyota's fixed price policy, or the "Access Toyota" program, in Canada. To date, the program has been implemented in all provinces of Canada, except for, due to provincial regulations, Ontario. This creates a natural experiment that allows us to explore the effects of a fixed price policy. In examining the competitive consequences of the program, we confine our analysis to two manufacturers: Toyota and its closest competitor, Honda. Although Honda vehicles share many similarities with their

Toyota counterparts, the company uses a different pricing strategy: it continues to sell its vehicles at negotiable prices, even after Toyota introduced its fixed price program.

In order to answer the question of how the fixed price policy affects the prices and sales performance of both Toyota and Honda, we analyze retail price and sales data for both brands across the major provinces of Canada. The empirical results indicate that prices of both Toyota and Honda vehicles are higher in areas where the program has been implemented than in those areas in which the program is absent. We also compare the sales performance for both brands before and after the program was introduced and find that, while the program did not affect Toyota's sales, it led to a one-time increase in the sales of Honda vehicles.

To the best of our knowledge, this is the first empirical study on the competitive consequences of switching to a fixed price policy while competitors allow for their prices to be negotiated. Previous studies, which are mostly theoretical in nature, have explored sellers' choice between a posted price and a bargaining price in competitive markets. For example, Bester (1993) and Wernerfelt (1994) derive equilibrium conditions under which either a bargaining or a posted price strategy is optimal, while Bester (1994) and Desai and Purohit (2004) show that, under certain conditions, both mechanisms are employed simultaneously in equilibrium. Desai and Purohit (2004) also find that under certain other conditions, a prisoner's dilemma type situation may arise: although both firms would be better off with a haggling price policy, each firm has an incentive to deviate to a fixed price strategy, forcing both to offer fixed prices; under other conditions, the reverse holds. Our research does not aim to understand the conditions under which such strategies are employed. Instead, our contribution lies in empirically documenting the consequences of a firm's choice of a fixed price strategy in a market where prices are predominantly bargained over.

Since implementing a fixed price policy restricts the prices that dealers can charge, our research is somewhat related to a large body of literature on resale price maintenance (RPM). This literature is motivated by the policy debate on whether or not RPM is anticompetitive and hence should be prohibited (See a survey by Mathewson & Winter, 1998). This stream of research finds that maintaining resale prices can either be anticompetitive if it facilitates price collusion (e.g., Jullien & Rey, 2007), or it can be beneficial if it either increases retailers' incentives to provide service (Klein & Murphy, 1988; Marvel & McCafferty, 1984) or in the presence of demand uncertainty, supports greater inventory holdings among retailers (Deneckere, Marvel, & Peck, 1997). However, this literature usually assumes that both the focal firm and the competition offer fixed prices. We therefore add to the literature by examining the case where competitors' prices are negotiated.

The remainder of the paper is organized as follows. In section 2, we begin with a description of the Access Toyota program. We then describe our data in section 3. Following this, we present an econometric analysis of prices and sales in section 4. Finally, we draw our conclusions in section 5.

2. Background: The Access Toyota Program

According to the Toyota Company, the "Access Toyota" program is an attempt to counter long-standing consumer dislike of negotiation during the car buying process. The decision to introduce the program in Canada was based on more than four years (in the late 1990's) of focus groups that found only a minority of car buyers actually enjoyed negotiating the price of their cars – an estimated 14% to 20% - while most people strongly disliked the process. Another objective of the program was to increase customer confidence and trust in Toyota

dealerships since, although consumers consider Toyota's vehicles to be among the top in quality, they tend to rate their experience at the company's showrooms as negative, at least in North America (The Gazette, 2002). Toyota summarized the purpose of the program as one which would "enrich and improve purchase and ownership experience" (Bloomberg News, 2002).[2]

Under the Access program, Toyota encourages its dealers to sell each of their vehicles at a fixed price or "access price", which is disclosed through the company's website. Dealerships in a defined geographic area (typically a province) determine the access price on a monthly basis via an electronic poll: each dealer submits a suggested selling price for every model they offer based on local market conditions. All prices are averaged into one price for each model and this price becomes the access price (Musgrove, 2008).

The program was launched in 2000, first in the province of Manitoba, after which it was expanded into Saskatchewan, Alberta, British Columbia and Quebec. By the end of 2002, it was implemented across all provinces in Canada except for Ontario, where it was disallowed in accordance with provincial regulations (The Gazette, 2004). Table 1 lists the timeline of introduction and the number of participating dealerships.

-[Insert Table 1 here]-

To summarize, the introduction of the Access program changed the nature of competition between Toyota and its competitors: while in Ontario all prices in the market continued to be negotiated (Figure 1a), in all remaining provinces, Toyota prices were fixed at the access price while competitors' prices continued to be determined through negotiation across all provinces (Figure 1b).

-[Insert Figure 1 here]

[2] See http://www.automotivedigest.com/view_art.asp?articlesID=5323 (accessed on July 16, 2008).

3. Data

In order to more fully understand the impact the program had in Canada, we not only examine its effect on Toyota but also include its closest competitor, Honda, in our analysis. Vehicles offered by these two manufacturers are widely recognized as close competitors in terms of their market positions and comparability of their products. For example, according to (Consumer Reports, 2007), the following pairs of models are considered the top picks in their respective categories: the Toyota Camry and the Honda Accord (family sedans), the Toyota Corolla and the Honda Civic (small cars), the Toyota RAV4 and the Honda CR-V (small SUVs) and, the Toyota Sienna and the Honda Odyssey (minivans). It therefore, seems reasonable to conclude that the two manufactures offer a number of vehicles that are very close competitors.

Furthermore, in Canada, Toyota and Honda have a combined share of over 60% among Japanese automakers, and approximately 18% among all car manufacturers (2006).[3] In other words, among vehicles that are conceivably close competitors, i.e., Japanese cars, Toyota and Honda command a significant share. However, at the same time, their total share across all nameplates is small enough such that we can capture the main impact of the program by limiting our focus to just these two manufacturers.

For our analysis, we collect both price and sales data. The sources we use to obtain both types of data, however, are different. We therefore provide separate descriptions of each type, starting with the sales data and then following with the price data.

3.1. Sales Data

[3] The data for brand sales is obtained from the Japan Automobile Manufacturers Association of Canada. The data for the industry sales is obtained from Statistics Canada.

We obtain sales data for both manufacturers from new vehicle registration data collected by R.L. Polk Canada, Inc. The data reports the annual sales of a panel of 131 census metropolitan areas in six major provinces of Canada over a period of 12 years, from 1995 to 2006. The data contains the registration counts, the make and model of the vehicle, the census metropolitan area, and the year at the time of sale. Among the 131 census areas, 42 belonged to the province of Ontario, where the program was never introduced, whereas in the remaining census areas it was adopted over the period 2000-2002.

Of the two manufacturers, Honda's total sales over the period 1995-2006 (=1,316,939) were lower than that of Toyota's (=1,524,583). As a result, to ensure that we have enough observations for our analysis, we begin by identifying the four largest selling Honda models (which accounted for approximately 95% of Honda's sales during 1995-2006) and then match them with the Toyota models that according to *Consumer Reports*, are their closest competitors. The four pairs of matched models are: the Toyota Corolla versus the Honda Civic (small car category), the Toyota Camry versus the Honda Accord (family sedan category), the Toyota RAV4 versus the Honda CR-V (small SUV category), and the Toyota Sienna versus the Honda Odyssey (minivan category). All eight models have significant sales figures (> 50,000) during the estimation period and, while not all models are available during the entire period, all are available before and after the program was introduced, making them suitable candidates for analyzing the impact of the program. The models, their sales and periods of availability are listed in Table 2.

-[Insert Table 2 here]-

3.2. Price Data

Our price data are based on transaction data collected by the Power Information Network (PIN), a division of J. D. Power and Associates. PIN collects daily point-of-sales data from voluntarily participating dealers in major metropolitan areas in Canada, which are then aggregated to the city-level on a monthly basis. For Toyota and Honda vehicles, PIN transactions represent approximately 40% of all new vehicle retail transactions in Canada.

Our dataset contains observations during the period August 2004 to September 2007 across five major cities in Canada: Vancouver (in British Columbia), Toronto (in Ontario), Calgary and Edmonton (in Alberta) and, Montreal (in Quebec). Toyota dealerships in all of these cities, except Toronto, operate under the Access program. Unfortunately, we do not have data during the period *before* the program was implemented. This introduces potential problems when analyzing the impact of the program, which we discuss in section 4.

For each observation, we have the average transaction price by city, month, and year as well as the make, model and trim level of the vehicle. The average price is computed based on the individual transaction prices of the base vehicle plus factory and dealer-installed accessories and options contracted for at the time of sale, less a customer cash rebate, if any. The price is also adjusted by the "trade-in over allowance", which is the difference between the price the dealer pays the consumer for a traded-in vehicle and its true market value. According to Zhu et al (2008), customers who traded in a used car, paid, on average, more than buyers who did not have a car to trade in. As a result, it is important to adjust the price for the over-allowance so that price reflects the true price of the vehicle; failing to adjust could result in the price being overstated.[4]

[4] For example, when a customer buys a $20,000 car with a traded-in car which is worth $7,000, the dealer may pay $8,000 for the traded-in car (i.e., over-allowance is $1,000) and charge the customer $21,000 for the new car. Thus, the face price $21,000 is higher than the true price that the customer pays for the new car.

Compared to the sales data, which is at the make and model level, the price data are at the trim level (e.g., Toyota Camry LE, Toyota Camry SE). To maintain consistency between the sales and price analysis, we consider prices also at the model level (e.g., Toyota Camry) by computing the share-weighted average of all prices at the trim level. For example, the price of the Toyota Camry in a particular city is given by the average price of all trim levels, weighted by the sales of the individual trims.[5] Table 3 provides a brief description of the price data by model and by program.

-[Insert Table 3 here]-

4. Analyses and Results

As the nature of the sales and price data are somewhat different, we employ slightly different econometric models to analyze the program impact on each. Since the main purpose of the program was to give customers access to fair prices, we start with an analysis of prices. We follow the price analysis with our sales model.

4.1. Impact of Program on Prices

Model. In order to understand the impact of the program on prices, we estimate a cross-sectional, time-series regression model, correcting for heteroskedasticity and serial correlation of errors. We use the log form of price as our dependent variable so that any changes in prices are better understood as a percentage of the vehicle's original price, an approach which has been used in a number of studies of the automobile market (e.g., Sloot,

[5] A potential problem of using the share-weighted average price for each city is that the model price is confounded by the share of individual trims in each city. For example, the Toyota Camry can have a high price either because all its trims have high prices, or because a highly priced trim has a large share. We therefore compare the shares of individual trims for each of the eight models across the different cities and find that these shares are similar across all of them. Thus, any difference in computed prices is not driven by differences in individual trim level shares, but is representative of the actual prices in each city.

Fok, & Verhoef, 2006; Zettelmeyer, Scott Morton, & Silva-Risso, 2006). We estimate the following specification:

$$\ln P_{ijt} = \alpha + \sum_{t=1}^{T-1} \gamma_t M_t^T + \sum_{j=1}^{H-1} \delta_j M_i^H + \sum_{i=1}^{I-1} \beta_i Z_i + \sum_{m=1}^{M-1} \lambda_m M_m + \sum_{n=1}^{N-1} \varphi_n Y_n + \sum_{t=1}^{T-1} \tau_t M_t + \sum_{r=1}^{R} \theta_r V_r + \eta_j + \varepsilon_{ijt}$$

where:

P_{ijt} = price of vehicle model i in city j in month t,

M_i^T (or M_i^H) = dummy for manufacturer: = 1 if Toyota (or Honda), = 0 otherwise,

A_j = indicator of program adoption: = 1 if program is implemented in city j, = 0 otherwise,

Z_i = dummy for vehicle models, 1 to $I-1$, I = 8,

M_m = dummy for a model year m, 1 to $M-1$, M = 4 (2004-2007),

Y_n = dummy for year n, 1 to $N-1$, N = 4,

M_t = dummy for month, t 1 to $T-1$, T = 12,

V_r = dummy for major model re-design events, 1 to R, R = 5,

η_j = time-invariant city characteristics,

u_{ijt} = stochastic error term, assumed to be heteroskedastic and following a first order autoregressive (AR(1)) process, i.e., $u_{ijt} = \rho u_{ijt-1} + \varepsilon_{ijt}$, where $|\rho| < 1$, and ε_{ijt} is independently distributed.

The impact of the program is captured through the variable A_j. We believe that it is reasonable to assume that the program may have affected the two manufacturers' prices differently and therefore identify the differential impact of the program with the inclusion of two manufacturer specific dummies: M_i^T a n d M_i We also control for model specific fixed effects by adding both model and model year dummies, and control for time variation in prices with month and year specific dummies. It is especially important to control for time variation as vehicles are often heavily promoted, either when new models are introduced, or at the end of the year.

We also include dummies that represent model re-designs that allow us to control for price increases that may be a result of quality improvements. While most models undergo some sort of change from year to year, usually these changes are small and are unlikely to have a significant impact on price. We therefore define model re-design as a "new generation", which typically involves significant changes to the body, chassis, drive train, and interior. Using *Consumer Reports* as our source, we identify five major changes to the models in our sample during the period August, 2004 to September, 2007, all of which are listed in Table 4.[6]

-[Insert Table 4 here]-

Since we have time-series data, we must account for the possibility that the errors are correlated over time. Furthermore, because of the cross-sectional nature of the data, it is quite possible that the error terms in equation are heteroskedastic. Not accounting for serial correlation and heteroskedasticity implies that the least squares estimator will be unbiased but will no longer be the best linear unbiased estimator (B.L.U.E) (Wooldridge, 2002). For

[6] The redesign for the 2004 Sienna is not included as the price data does not contain observations for the Sienna prior to 2004.

example, in the case of negative serial correlation, the estimates of the standard errors will be higher than they should be which can result in incorrect tests of hypotheses.

In order to correct for both heteroskedasticity and serial correlation, we use a feasible generalized least squares approach (FGLS) with a Prais-Winsten regression estimator and compute panel-corrected standard errors. This is known in the literature as the *full* FGLS approach. Although the FGLS estimator is not B.L.U.E, it is asymptotically more efficient than the OLS estimator when there is AR(1) serial correlation. The Prais-Winsten method is used as it preserves the first observation in the estimation so that it is particularly suitable when the time series are relatively short (Wooldridge, 2002, p.404).

Since the data does not contain observations before the program introduction date (2000~2002), our analysis has certain limitations. Specifically, we are unable to control directly for the existing price differences between two groups of cities that may be due to factors other than the program, such as income levels, weather conditions, etc. For example, prices in Vancouver may be higher on average than in Toronto simply because income levels are higher in the former. Using city level fixed effects are not feasible as they cannot be identified separately from the program effect.[7]

To address this issue, we collect average market prices of *all* nameplates in each of the five cities. The source of these data is also PIN. Presumably, since Toyota and Honda account for only 18% of the new car market, the impact of the program on average prices in general should be relatively small. Therefore, comparing the average prices of all nameplates across the same set of cities would allow us to measure any price differences that may be due to factors other than the program. The inherent assumption here is that city specific

[7] Econometrically, this implies that there are unobserved city characteristics, f_j, which are correlated with the program adoption areas. Not accounting for them in equation implies that using a standard OLS procedure will result in biased estimates of the program coefficients.

characteristics that could create such differences remain constant over time. In order to test whether differences exist across cities, we estimate the following specification:

$$\ln(P_{jt}) = \gamma_0 + \gamma_1 A_j + \sum_{m=1}^{M-1} \delta_m M_{mt} + \sum_{n=1}^{N-1} \alpha_n Y_{nt} + \sum_{t=1}^{T-1} \beta_t M_{tt} + \omega_{jt} \quad (1)$$

where

P_{jt} = average price of all nameplates j in city j in month t,
A_j = indicator of program area: = 1 if city j is in the program area, = 0 otherwise,
M_m = dummy for a model year m, $m = 1, \ldots, M-1$ (M = 2008),
Y_n = dummy for year n, $n = 1$ to $N-1$, N = 2004,
M_t = dummy for month t, $t = 1$ to $T-1$, T = 12,
ω_{jt} = stochastic error term, assumed to be heteroskedastic and following a first order autoregressive (AR(1)) process, $\omega_{jt} = \rho \omega_{jt-1} + \varepsilon_{jt}$, where $|\rho| < 1$, and ε_{jt} is independently distributed.

If γ_1 is positive and significant, this indicates that there are inherent differences between the program and non-program areas which result in higher prices in the former.

Discussion of Results. The parameter estimates of our main pricing model, equation (1) are listed in Table 5.

-[Insert Table 5 here]-

β_1^T and β_1^H are the parameters that capture the effect of the program on prices for Toyota and Honda respectively: both parameters are positive and significant indicating that the program resulted in higher prices for both manufacturers' vehicles. Specifically, $\beta_1^T = 0.0$ which implies that the prices of Toyota's vehicles were, on average, 2% higher in areas with the program than those without the program. While gross margin data are not available for automobiles in Canada, according to CarCostCanada.com, dealers typically expect margins

between 3-5%. Thus, the 2% difference is not only meaningful in dollar terms for a new car buyer, but also economically important to the dealer. The program effect was also significant for Honda vehicles: prices are 6% higher in areas that belong to the program.

In order to conclude that the price differential between program and non-program areas is indeed driven by the program, we need to rule out the possibility that the differential may potentially be driven by any differences in existing area characteristics. Equation , which models average prices for all nameplates as a function of whether the area is part of a program areas or not (and other variables), allows us to test whether other differences contribute towards the price difference. The results of this analysis are listed in Table 6:

-[Insert Table 6 here]-

We find that the coefficient, γ_1, of the program area dummy, A_j, is not significantly different from zero at the 0.05 level. This suggests that there is no statistically significant difference between the average price of all nameplates between areas with the program and areas without. This supports the conclusion that the observed price differential between Toyota and Honda vehicles between the program and non-program cities is more likely due to the Access Toyota program and not any differences in area characteristics. In other words, ε_j is not correlated with A_j and the FGLS results in unbiased estimates of α_1^T and α_1^H.

The results of equation largely rule out the possibility that there are inherent differences in pricing across program and non-program areas. Another economic factor might be transportation costs differing across provinces, but both Toyota and Honda charge the same transportation fee for all provinces, regardless of place of manufacture or importation. Moreover, while market shares for Toyota and Honda vary across provinces, as listed in Table 7, the two brands have a higher market share (of all brands) in Ontario than they do in

the rest of Canada, which may suggest higher preferences for the two brands in Ontario. Thus, if higher preferences have an effect on prices, we would expect to see that effect occur in Ontario.

Our findings regarding the impact of the program on Toyota's prices are consistent with evidence obtained from two other smaller scale studies. First, in a CBC news investigation (CBC Disclosure, 2003), a comparison of the prices of the Toyota Camry XLE across dealerships in Montreal and Toronto revealed that the average price in Montreal, where the program was in place, was $500 higher than the average price across dealerships in Toronto. This is despite the fact that the Retail Price Index in Toronto is higher which suggests that buying a car in Toronto should usually be more expensive than the same car in Montreal. In 2005, the Automobile Consumer Coalition of Canada (2006) sent a researcher, who acted as a typical consumer, to 53 Toyota and Honda dealerships in Quebec, Ontario, Alberta and British Columbia to negotiate the prices for two vehicles: the Toyota Camry LE and Honda Accord DX-G. The researcher found that Toyota dealerships asked for higher prices in cities where the program had been introduced, but the price asked for the Honda Accord DX-G was approximately the same in cities with the program and those without.[8]

One possible reason for why we find that Toyota experienced an increase in its prices is that the no-haggle price policy may have improved consumers' shopping experience. For many consumers, negotiation is costly as it takes time and effort and consumers are often afraid of being taken advantage of by salespeople (The Economist, 2006). The Access program effectively eliminates consumers' cost of negotiation and so dealers are able to charge a premium, resulting in a higher average price.

[8] These two studies are based on the price the dealer asked for the car after some negotiation, but the actual transaction price might be different.

Surprisingly, we find that Honda's prices also increased as a result of the program. To date, there has been very little research on the impact of the program on Toyota's competitors. The only exception is the investigation carried out by the Automobile Consumer Coalition (2006), as discussed above. While the results of this study differ from ours, we believe that our findings are more robust as our analysis examines a larger set of models over an extended period of time and in a more systematic manner.

Honda's higher prices are probably due to the fact that the higher prices of Toyota vehicles effectively reduce price competition between the two brands, allowing Honda dealerships to increase their prices as well. Furthermore, the dealer environment (no-haggle versus haggle) may also further differentiate the two brands allowing for more price flexibility.

4.2. Impact of Program on Sales

Model. Next, we attempt to understand the impact of the program on the sales of both manufacturers. We consider the following specification:

$$Q_i = \beta_0 + \sum_{n=1}^{N-1} \gamma_n Y_n + \sum_{r=1}^{R} \delta_r X_{ir} + \varepsilon_i,$$

where:

Q_{ijt} = sales of vehicle model i in area j in year t,

M_i^T (or M_i^H) = dummy for manufacturer: = 1 if Toyota (or Honda), = 0 otherwise,

A_j = indicator of program adoption: = 1 if program was implemented in area j in year t, = 0 otherwise,

Z_i = dummy for vehicle models, 1 to $N-1$, N = 8,

Y_n = dummy for year n, n = 1 to $N-1$, N = 12,

V_r = dummy for major model re-design event, r = 1, ..., R, R = 14,

k_j = unobserved time-invariant characteristics of area j,

ε_{ijt} = stochastic error term, assumed to be heteroskedastic and following a first order autoregressive (AR(1)) process, $\varepsilon_{ijt} = \rho_{ij}\varepsilon_{ijt-1} + \eta_{ijt}$, where $|\rho| < 1$, and η_{ijt} is independently distributed.

We use the log form of sales as our independent variable so that the model coefficients represent the percentage changes in the annual sales. We identify separate program effects for Toyota and Honda via an interaction between the program adoption dummy, A_j, and manufacturer indicator, M_i^T (M_i^H). We incorporate model and time dummies to control for model specific fixed effects and time variation respectively. We also control for model re-design events: 14 such events occurred over the period 1995 – 2006, as listed in Table 4. However, we are unable to control for model years as this information is not available in the data: all sales in a particular year for a particular model are considered to be for the same vehicle.

As in the pricing model, we are unable to directly control for area specific differences between program and non-program areas which, besides the program, may have an impact on sales: including area specific constants does not allow us to identify the program and area effects separately, resulting in biased estimates of the program coefficients. However, unlike the pricing model, the sales data runs from a period before the program was implemented. By taking first differences, we are able to eliminate the area specific effects, k_j (which we

assume remain constant over time), but retain the program effects for the years in which the program was introduced:

$$\Delta \ln Q_i = \gamma_{j0}\Delta M_t + \beta_1^T \Delta A_j^T + \beta_1^H \Delta A_j^H + \sum_{i=1}^{I-1} \delta_i \Delta Y_i + \sum_{n=1}^{N-1} \alpha_n \Delta d_n + \sum_{r=1}^{R} \theta_r \Delta + \Delta V_j$$

where Δ represents the difference between two adjacent periods.

In equation , the program coefficients, β_1^T and β_1^H, now represent a *one time* percentage change in the sales growth rate that may have occurred once the program was implemented. Note that by allowing for an interaction between the model dummies, Z_i, and time, (t-1 9 9 5 in equation , we are able to retain the model dummies in equation and thus control for any differences in sales growth rate which may be a function of a particular model type. In order for β_1^T and β_1^H to be unbiased and consistent, we assume that ΔA_j and $\Delta \varepsilon_{ij}$ are independent.

The least-squares estimator for equation is called the "fixed-effects" estimator, where the fixed effect is eliminated by differencing following the standard approach (Wooldridge, 2002). Again, we use the *full* FGLS approach as we do for the price model to correct for both heteroskedasticity and serial correlation.

Discussion of Results. The parameter estimates of the sales model, equation are listed in Table 8.

-[Insert Table 8 here]-

We find that while the program had a significant and positive effect on Honda's sales, there was no effect on the sales of Toyota. Specifically, Honda's sales were 13% higher in the provinces with the program than in those without the program, as compared to their sales before the program was introduced. In an unreported analysis, we also examine the sales of

all nameplates, and the result shows that there is no statistically significant difference in sales between program area and no-program area after the program was introduced. This excludes the possibility that Honda's sales increase may be driven by the growth of the entire car market in the provinces with the program.[9]

Given that we find that both Toyota's and Honda's prices increase as a consequence of the program, at first, these results may be somewhat surprising as one would expect the sales growth rate to fall for both manufacturers. However, there are several possible reasons why this may have occurred.

First, with regard to the overall sales pattern, it could be that despite the price increase, buyers continued to find both brands attractive, thus limiting the impact of the price increases. Second, the differential effects for Toyota and Honda could depend on car buyers' preferences for negotiation: buyers who prefer to bargain and feel that the time they invest leads to a better deal would tend to favor Honda, while those who value the convenience of not having to bargain, would have a higher chance of choosing Toyota. If the distribution of consumer preferences is skewed more towards consumers who prefer to bargain, this would explain why Honda experienced an increase in its growth rate. Furthermore, in areas where the program exists, Honda salespeople may have an advantage over their Toyota counterparts as they are able to use Toyota's access prices as a comparison point while negotiating. This may result in a large number of consumers switching from Toyota to Honda. On the other hand, in non-program areas, Honda dealerships lose this advantage as they are unable to make such comparisons since Toyota's prices are negotiated and are not transparent to their competitors.

[9] It may be also argued that Honda's sales increase is possibly driven by its expansion in distribution. According to Desrosiers, an auto consulting firm, the number of Honda dealers in the five program provinces was 119 in 2000 and 121 in 2006, and in Ontario was 69 in 2000 and 71 in 2006, the percentage change in the number of dealers being very small. Therefore, the Honda's sales increase appears not to be driven by changes in distribution strategy.

5. Conclusion

In the automobile market, the practice of using fixed prices is becoming increasingly common. Despite this, the implications of introducing a fixed price policy in a market where prices are predominantly negotiated remain largely unexplored. This research is one of the few empirical studies that analyze the competitive consequences of such a strategy. We use the Access Toyota program which has been implemented in Canada as our context as it provides a natural experimental setting within which we can appropriately explore this question.

While the Access program has generated much interest in Canada and has been the topic of much discussion, the consequences of its introduction have so far remained unclear. According to some reports, the program has been very consumer-friendly and has received much support amongst customers.[10] It was therefore expected by some that the Access program would result in lower prices for consumers as it would make the price information more transparent and fair (The Gazette, 2002). According to others, however, the driving force behind the move was to address "dealer profitability" and predictions were that prices would increase (Walsh, 2003). Our research is the first that systematically assesses the impact of the program not just only on Toyota, but also on its competition.

In particular, we focus on the program's impact on the prices and sales of Toyota and its closest competitor, Honda. We find that the introduction of the fixed price policy resulted in price increases for both firms, probably because consumers were willing to pay a premium to avoid haggling which also gave Honda the flexibility to increase prices. However, Toyota's

[10] Surveys conducted in British Columbia and Quebec show that, once the program was introduced, 70% of British Columbians and 77% of Quebecers were in its favor (The Gazette, 2002).

sales remained unaffected even though, surprisingly, Honda experienced a jump in sales, perhaps due to some consumers switching away from Toyota due to perceptions that a fixed price may not allow them to obtain a fair price.

The price increase that resulted from the program introduction may have led to some regulatory concerns. Some allegations that the Access program was tantamount to price maintenance resulted in the Competition Bureau examining whether Toyota was prohibiting participating dealers from selling vehicles below the Access price.[11] These claims, however, were not proven in court and Toyota was allowed to continue with the program, with some minor revisions. However, our findings clearly indicate that, even though many applauded Toyota for its attempt to introduce a hassle free approach to car buying, some of the benefits may have been discounted by the increase in prices, especially for Honda consumers who experienced a price increase without any reduction in haggling costs.

Our research can be generalized to similar situations where competitive firms have adopted different pricing formats from each other (bargaining versus a posted price). Examples of such markets include products like boats, musical instruments and jewelry. For instance, prices of boat are traditionally negotiated but some manufacturers such as Tracker and Nitro are now selling their boats at a fixed price. Such situations also exist in the online world – www.priceline.com style haggling or online negotiation enabled by "shop bots" (New York Times, 2000) provide online companies the choice between bargaining and posted prices. Our findings thus shed light on the impact of such pricing decisions relevant to a wide range of domains.

[11] The Competition Bureau's news release, "Competition Bureau settles price maintenance and misleading advertising case regarding the Access Toyota program" (March 28, 2003), and the Prohibition Order and Agreed Statement of Facts in this case are available online at: http://www.competitionbureau.gc.ca/epic/site/cb-bc.nsf/en/00300e.html.

Some questions remain unanswered. First, our research does not address why a firm may choose a different pricing format from its competitor. For example, while we were able to understand the impact of the program on Toyota and Honda, we were unable to address the motivations behind Honda's choice. According to some theoretical studies, a fixed price policy, due to its commitment effect, may serve to reduce consumers' uncertainty about product quality (Riley & Zeckhauser, 1983; Wernerfelt, 1994), or allow a dealer to charge a higher price by saving consumers' haggling cost. However, the downside of such a policy is that it limits a firm's ability to price discriminate (Ayres & Siegelman, 1995; Goldberg, 1996). Further, in the case of Toyota, the manufacturer's choice of pricing strategy may also depend on the relationship between it and its downstream dealerships. We leave this question for future research.

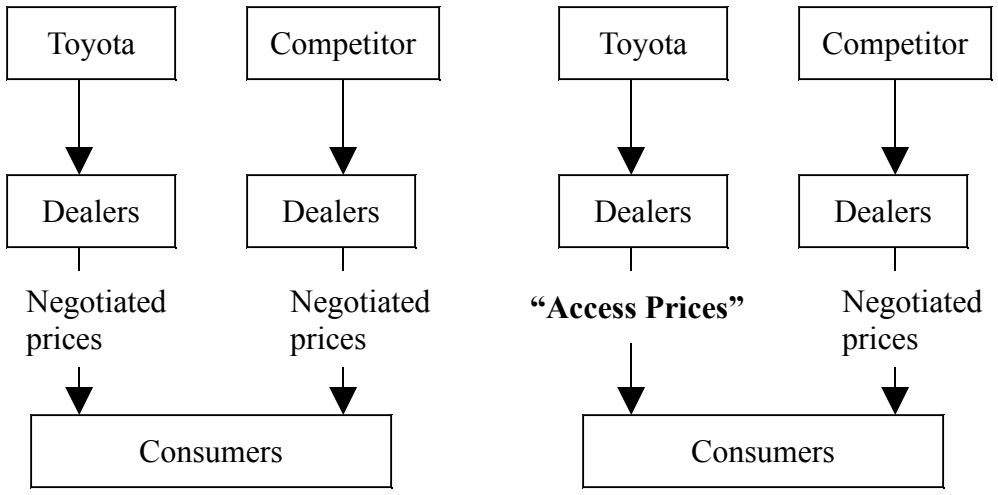
Second, one of our speculations is that despite the increase in prices, the program may have had an impact on other performance metrics, such as services. From consumers' point of view, both price and service are important. While it may be tempting to conclude that higher prices resulting from the program introduction left consumers worse off, such a conclusion may be erroneous as it fails to account for other factors. Anecdotal evidences suggest that many Toyota purchasers were happy with the program, especially because of the improvements in service. For example, one facet of the program involves re-identifying sales people as product advisors and developing a more flexible customer service process, changing the sales process to reduce consumers' time spent in the dealership and the utilization of the Internet to complete a transaction, rather than at the lot. A Maritz (2001) study shows increased satisfaction among consumers who dealt with Toyota dealers following the introduction of the Access program.[12] Furthermore, the reduced competition

[12] See the news at http://www.canadiandriver.com/news/020122-1.htm (accessed on June 26, 2008).

between Honda and Toyota may have also allowed Honda dealerships to focus more on service provision rather than price negotiations. This suggests that, overall, the program may have benefited consumers, even if prices are higher. An extension of our research in this direction can shed valuable light on the consequences of such a policy on consumer welfare and hence provide guidance to regulatory agencies on the practice of fixed price strategies.

Finally, one of the questions that arise in relation to our findings is whether higher prices are a result of collusion, either among Toyota dealerships, or even between Toyota and Honda. This question also has important regulatory implications, but is beyond the scope of this current study. We leave it for future research.

Figure 1: A Duopoly Model



(a) Without the program (Ontario)

(b) With the program (Other provinces)

Table 1: Program Adoption in the Six Largest Provinces in Canada

Province	Access program	Launch Date	Total # of Dealers
Alberta	Yes	Jun, 2001	17
British Columbia	Yes	Jun, 2002	34
Manitoba	Yes	Mar, 2000	7
Ontario	No	--	78
Quebec	Yes	Jan, 2002	68
Saskatchewan	Yes	Jun, 2001	6

Note: The number of dealerships and program availability in each province were obtained from Toyota Canada's website in November, 2006. The launch dates are based on news reports from *Canada NewsWire, Marketing Magazine,* and *The Globe and Mail*.

Table 2: Total Sales by Models during 1995~2006

Make	Model	Total Sales	Category	Available
HONDA	CIVIC	688,177	Small car	1972 – present
HONDA	ACCORD	289,072	Family car	1976 – present
HONDA	CR-V	157,065	Small SUV	1996 – present
HONDA	ODYSSEY	111,102	Minivan	1995 – present
HONDA	OTHERS	71,523		
HONDA	TOTAL	1,316,939		
TOYOTA	COROLLA	473,913	Small car	1966 – present
TOYOTA	CAMRY	254,626	Family car	1983 – present
TOYOTA	ECHO	157,457	Budget small car	1999 – 2005
TOYOTA	SIENNA	121,486	Minivan	1998 – present
TOYOTA	MATRIX	91,831	Small wagon	2003 – present
TOYOTA	TERCEL	85,422	Small car	1978 – 1999
TOYOTA	RAV4	84,157	Small SUV	1994 – present
TOYOTA	4RUNNER	52,397	Midsized SUV	1984 – present
TOYOTA	OTHERS	203,294		
TOYOTA	TOTAL	1,524,583		

Table 3: Description of the Price Data

Model	With the program		Without the program	
	Mean	Standard Deviation	Mean	Standard Deviation
Toyota Corolla	$19,579	$943	$19,192	$272
Toyota Camry	$27,847	$1,668	$26,406	$1,157
Toyota RAV4	$31,093	$2,352	$30,137	$1,782
Toyota Sienna	$34,302	$2,560	$33,326	$2,151
Honda Civic	$21,104	$1,627	$20,335	$1,207
Honda Accord	$29,389	$1,701	$27,267	$2,886
Honda Odyssey	$38,815	$2,607	$36,599	$3,889
Honda CR-V	$32,034	$1,639	$30,150	$2,899

Note: [1] Cities with the program include Calgary/Edmonton in the province of Alberta, Montreal in the province of Quebec, and Vancouver in the province of British Columbia. The city without the program is Toronto in the province of Ontario.

[2] Means and standard deviations are based on the city-level average prices on a monthly basis from August 2004 to September 2007. (It should be noted that, as the prices are the city-level averages from five cities, the fixed-price policy does not predict that the standard deviation of these prices is lower.)

Table 4: Model Redesigns during 1995~2007

Make	Series	Model years redesigned
HONDA	CIVIC	2001, 2006
HONDA	ACCORD	1998, 2003
HONDA	CR-V	2002, 2007
HONDA	ODYSSEY	1999, 2005
TOYOTA	COROLLA	1998, 2003
TOYOTA	CAMRY	2002, 2007
TOYOTA	RAV4	2001, 2006
TOYOTA	SIENNA	1998, 2004

Source: from *Consumer Reports* (October, 2007)

Table 5: Prices of Honda and Toyota in Areas with and without the Program

Dependent Variable = Ln(Price)

Variable	Parameter Estimates	Variable	Parameter Estimates
Intercept	9.75** (.01)	Year2004 (as base year)	
Toyota*Program	.02** (.01)	Year2005	−.06** (.01)
Honda*Program	.06** (.01)	Year2006	−.10** (.01)
Toyota Corolla (as base series)		Year2007	−.13** (.02)
Toyota Camry	.37** (.01)	Civic 2006	.02** (.01)
Toyota Sienna	.57** (.01)	CR-V 2007	−.03** (.01)
Toyota RAV4	.47** (.01)	M_year2004 (as base model year)	
Honda Civic	.06** (.01)	M_year2005	.13** (.01)
Honda Accord	.40** (.01)	M_year2006	.20** (.02)
Honda Odyssey	.67** (.01)	M_year2007	.27** (.02)
Honda CR-V	.48** (.01)		
R-squared	.998		
Observations	1527		

Notes: [1] Standard errors are in parentheses. * = p<.05; ** = p<.01.

[2] The above results do not report fixed effects for months. In addition, the coefficients for three major model redesigns (Odyssey 2005, Camry 2007, and RAV4 2006) were not significant and therefore are not reported.

Table 6: Prices of All Nameplates in Areas with and without the Program

Dependent Variable = Ln(Price of All Nameplates)

Variable	Parameter Estimates
Intercept	10.95** (.32)
Provinces with the program	−.07 (.10)
M_year2004 (as base model year)	
M_year2005	.02 (.12)
M_year2006	.35 (.22)
M_year2007	.74* (.29)
Year2004 (as base year)	
Year2005	−.26 (.28)
Year2006	−.64* (.29)
Year2007	−1.52** (.40)
R-squared	.975
Observations	409

Notes: The above results do not report fixed effects for months. Standard errors are in parentheses. * = p<.05; ** = p<.01.

Table 7: Market Share of Toyota and Honda by Provinces

		Before program		After program	
		Honda	Toyota	Honda	Toyota
Program area	Alberta	4.3%	3.1%	5.9%	4.1%
	BC	7.9%	5.8%	8.9%	6.4%
	Manitoba	4.5%	4.4%	7.0%	5.7%
	Quebec	5.1%	4.0%	5.6%	4.2%
	Saskatchewan	4.3%	3.2%	7.1%	4.2%
	Average	5.2%	4.1%	6.9%	4.9%
No-program area	Ontario	6.2%	5.1%	7.7%	6.5%

Note: The share in a province is the weighted average share over census metropolitan areas in that province. As the program was introduced to most provinces in 2001 and 2002, we define "before program" to be 1995-2000, and "after program" to be 2003-2006.

Table 8: Changes in Sales of Honda and Toyota in Provinces with and without the Program

Dependent Variable = ΔLn(sales)

Variable	Parameter Estimates	Variable	Parameter Estimates
Intercept	.23** (.07)	ΔOdyssey 1999	1.40** (.20)
Toyota*ΔProgram	−.01 (.07)	ΔOdyssey 2005	.45* (.18)
Honda*ΔProgram	.13* (.06)	ΔCR-V 2002	.40** (.12)
Toyota Corolla (as base series)		ΔYear1997	.17* (.08)
Toyota Camry	−.01 (.04)	ΔYear1998	−.08 (.08)
Toyota Sienna	−.07 (.08)	ΔYear1999	−.26** (.07)
Toyota RAV4	−.05 (.12)	ΔYear2000	−.14* (.07)
Honda Civic	.01 (.03)	ΔYear2001	−.13 (.08)
Honda Accord	−.05* (.02)	ΔYear2002	−.05 (.08)
Honda Odyssey	−.12* (.05)	ΔYear2003	−.13 (.08)
Honda CR-V	−.05 (.04)	ΔYear2004	−.21** (.07)
ΔSienna 1998	1.17** (.30)	ΔYear2005	−.20** (.07)
ΔRAV4 2006	1.01* (.42)	ΔYear2006	−.12* (.08)
Observations	10114	R-squared	.234

Notes: [1] Standard errors are in parentheses. * = p<.05; ** = p<.01.

[2] The above results do not report the insignificant coefficients for major model redesigns.

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