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1. Introduction

Prices for identical automobile models are significantly different across international borders of the European Union, in spite of the market integration efforts and product homogeneity. Historically, price differences of up to 90 percent could be observed. Recently, as the European Union became more and more integrated, these differences got smaller, but are still at a level not explained by cost differences. Differences of up to 30 percent can still be observed today for some models.

Explanations based on product differentiation as in Mertens and Ginsburgh (1985), price leadership as in Kirman and Schueller (1990), and price discrimination as in Verboven (1996) or Goldberg and Verboven (2001, 2004 and 2005) were offered. Many of the proposed factors that could explain price differentials are no longer in effect today: models are practically identical across countries since the EU has adopted uniform standards of safety and pollution, import quotas have been completely eliminated, and the introduction of the Euro has eliminated any exchange rates effects in the Euro zone. The effect of these institutional changes is well documented in Goldberg and Verboven (2005) and also in Pareja and Rivero (2008). In spite of these institutional changes, prices are far from full convergence.

A central theme in many of the studies done on the European auto markets has been the presence and the importance of a domestic brand bias. It has been argued that consumers prefer domestic cars, which incentivizes manufacturers to internationally price discriminate and charge more for domestic brands. This international price discrimination is facilitated by the exclusive dealership system that is in place, which prevents international arbitrage. The anti-competitive practices associated with this exclusive dealership system go to the point where manufacturers explicitly forbid the dealers to sell to foreign customers or to offer service for cars bought abroad. This continues to be a thorn in the side of free trade to this day, in spite of numerous law suits and fines imposed on all major manufacturers.

This paper digs a bit deeper into the issue of domestic brand bias and shows that this is not a general bias at all. In fact, there just seems to be an overall preference for western European cars, and the higher prices in Germany, France, or Italy are more suggestive of collusive patterns, than of domestic brand biases.

2. Data Description

We use a panel dataset comprising of 51 automobile models sold across 21 European countries, which gives a total of 1071 observations. Previous studies considered either cross sectional data, or more traditional panels with models across time for a given country. We improve on the previous literature by accounting for cross country heterogeneities and studying country specific variables, such as income.

The dependent variable is the pre-tax manufacturer's suggested price in Euros for each model in each country of the sample on the 1st of January 2009. This data comes from the European Commission report on car prices for the year 2009.

The independent variables consist of hedonic variables that account for differences in cost and consumer preferences regarding physical attributes, national income and income inequality measures, and a series of dummy variables that point to different local market conditions. The hedonic variables are collected from manufacturers' websites and different

auto magazines, while the income related data is collected from UN sources. A list of all relevant variables is presented in the appendix.

3.   Estimation Results

For benchmark purposes, we first estimate a simple model at the aggregate level, using a random effects specification with robust standard errors[1]. Some hedonic variables were dropped to fix the multicollinearity problem.[2]. The results are presented below:

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Table I: Regression at the Aggregate Level

Dependent Variable - Price in Euros (excluding taxes)

Variable	Coefficient	St. Error
MadeIn	1026.39*	432.55
Income	0.023**	0.005
Gini	229.29**	38.64
RP10	-421.02**	61.36
Own Industry	-406.98*	164.90
MPG	-1185.27**	213.71
AWD	1336.289	4774.55
Diesel	14249.18**	3341.36
const	54632.65**	7783.33

*-significant at 5% level   **-significant at 1% level

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The effects of the physical characteristics and income related variables are what one would expect. People prefer and pay more for larger and more powerful cars. The sign of the fuel efficiency variable is somehow surprising, but this can actually be explained by the presence of a large and positive effect for diesel cars. Most fuel efficiency sensitive consumers purchase diesel cars in Europe. Most of those who purchase gas engines might be more concerned with the dynamic characteristics of the engines which are usually negatively correlated with fuel efficiency.

The income related variables also have the expected effects. What is more interesting to us is to focus on the alleged domestic brad bias. Simply regressing the country specific characteristics on prices seems to confirm the previously documented effect. The sign of the dummy variable *MadeIn* is positive and statistically significant, which would suggest that consumers prefer and are willing to pay higher prices for domestic brands. However, what seems to be true at the aggregate level might not be true at a more in depth look. We move on to a more careful approach and show that this average effect does not translate into a true domestic brand bias for all automobile producing countries.

To further capture differences in both cost, and preferences between different car brands, producer fixed effects will be introduced in all the following estimations. They are intended

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[1] A fixed effects model was also estimated and a Hausman test was employed to verify the validity of the random effects specification.

[2] The variance decomposition method (Belsley, Kuh, and Welsch 1980)was used to determine which variables needed to be dropped. The estimates of interest are robust, and remain practically unchanged.

to control for any other unobservable characteristic that is brand specific. We do not expect these brand specific coefficients to be very significant, but controlling for them is still important in the same way that controlling for the hedonic variables was.

We first look at the effects on prices that result from different competitive forces associated with the presence of a local producer. We construct different dummies for countries with one national brand, with 2 or 3 national brands, and for countries with more than 6 national brands. There are no countries with only 4 or 5 domestic brands. The omitted group is the group of countries with no domestic industry. If a domestic brand bias is indeed present, a local producer might monopolize the market and charge higher prices. At the same time, having more domestic producers might drive prices down since these producers might engage in price competition. Another aspect to consider is the competitive pressures imposed on the foreign producers. To capture this, we construct interactive dummies between the presence of local producers and the cars being domestic or foreign. The estimation of these coefficients points to the fact that the effect on prices is mainly due to foreign cars pricing, and not to domestic cars. All the separate regressions are random effects estimations with robust standard errors. Although not reported here, we control for all physical characteristics, cross country income heterogeneities, and other brand fixed effects. All the effects are summarized in Table II.

Table II: The Effects of a Domestic Producer
Dependent Variable - Price in Euros (excluding taxes)

Variable	Coefficient	St. Error
One Producer	459.70**	132.80
Two Producers	-1135.027**	257.74
Six Producers	-871.76**	283.64
Own Industry × Domestic	523.65	346.59
Own Industry × Foreign	-394.30**	133.99
One Producer × Domestic	-194.27	159.69
Two Producers × Domestic	-542.06	1195.81
Six Producers × Domestic	1097.27**	275.84
One Producer × Foreign	531.99**	139.95
Two Producers × Foreign	-1066.34**	259.01
Six Producers × Foreign	-1027.08**	308.19

*-significant at 5% level   **-significant at 1% level

The results of our first specification suggest that countries with only one producer have higher prices, while countries with two, three, or more producers have lower overall prices. An explanation consistent with the domestic brand bias hypothesis would suggest that a local producer might monopolize the market easier, and this would lead to higher prices, while having more producers competing against each other would lead to lower prices. However, note that cars on markets with more than six producers are priced higher than cars on markets with only two or three producers, which goes against this logic. Competition among domestic producers has to be higher on markets with six producers and hence prices should be lower on these markets if this was the sole result of domestic competition. In fact, what matters is the competitive pressure that domestic firms exert on foreign firms. Also many

individual producers are part of larger groups of firms, and sometimes these groups control domestic and foreign brands. For instance, the Volkswagen Group controls not only the Volkswagen brand, but also the Audi, Seat, and Skoda brands. Therefore, collusive behavior has to be taken seriously, and having six or more domestic producers does not necessarily mean more competition.

A second estimation, containing two interaction terms between the presence of a local industry and whether the car is domestically produced or foreign clearly shows that domestic cars are not priced any higher, at least at this level of aggregation. What actually matters is how foreign firms price their cars. Domestic market conditions put pressure on foreign firms to price lower than the domestic firms. This does not need to be the result of a domestic brand bias. As mentioned earlier, collusive behavior and market concentration is a serious cause for concern. For a much clearer picture, we go one step forward and again disaggregate the number of domestic producers and then interact it with the car being domestic or foreign. We find some surprising results.

Firstly, there is no statistically significant effect for domestic cars in countries with only one producer. In fact, in these countries foreign producers price higher. The overall price level in countries with only one producer was found to be significantly higher than in countries with no domestic industry, and this result taken without further analysis might pass as proof of the domestic brand bias. But in fact, the exact opposite is what happens here. This shows that one needs to be very careful when generalizing about domestic brand preferences. Countries with only one producer actually have a preference towards foreign brands, produced in countries with long histories of producing quality automobiles.

In countries with two or three domestic producers, it is still the case that domestic cars are not priced higher, but foreign cars have now significantly lower prices. This is also the case for countries with more producers, only domestic cars are also priced higher here. This might be the effect of some domestic brand preference, but at the same time, collusive behavior between manufacturing firms cannot be rejected.

In order to try and shed some light on this we include two different types of interactions: interactions between the producing country and the destination country for all manufacturing countries in our sample, and interactions between each individual producer and the destination countries. Once again, these are all random effects specifications with robust standard errors where we control for all hedonic variables, income heterogeneities, the presence of local producers, and brand fixed effects. These specifications account for any possible transaction or transportation costs between any two countries, but most importantly allow us to observe patterns of collusion, competition, and overall preference for cars in these countries.

There are seven manufacturing countries for which we have models in our sample: Italy, Germany, France, Sweden, The Czech Republic, Spain, and UK. We interact each of these countries with the remaining six and with itself, and obtain a table of 49 interaction terms that present the price differences compared with the average car price in the rest of the European Union. The self interaction terms (country Y × country Y) will pick up the individual domestic brand bias (in country Y), while the other interactions (country Y × country Z) will simply pick up the way cars produced in country Y are priced in country Z, relative to the rest of the EU. For the second specification, we have 15 brands of cars, representing 15 producers, that we interact with the destination countries to go one step deeper from

just interacting the producing country with the destination country. The reason behind this estimation strategy is that some producers are actually owned by certain groups and collusions would be more likely within the same group. One can think of two different types of effects associated with collusive behavior. One one hand, within any given country, local producers might collude among themselves, or even with foreign producers to increase prices in a cartel type fashion. This type of collusion would increase all prices within that country. The other type of possible collusive behavior is when producers, or groups of producers from different countries, collude to preserve their domestic market monopoly and stay out, or not competing hard with their accomplices on foreign markets. For instance, collusion between say Volkswagen and Fiat could mean that Volkswagen would price their cars so high in Italy that it won't threaten Fiat's position, and in response, Fiat would do the same in Germany. Both firms would maintain their dominant position on their domestic market and make higher profits overall. Table III presents the effects of the country by country interaction terms, with the producing countries on the rows, and the destination countries on the columns. Only the directional signs are presented here for easier identification. Full numerical results are included in the appendix.

Table III: Country by Country Interactions

	Italy	Germany	France	Sweden	Czech Rep.	Spain	UK
Italy	n.s.	+	+	n.s.	−	n.s.	−
Germany	+	+	+	−	n.s.	n.s.	−
France	+	+	+	−	n.s.	n.s.	−
Sweden	+	+	+	−	n.s.	n.s.	−
Czech Rep.	+	+	+	−	−	n.s.	−
Spain	+	+	+	n.s.	n.s.	n.s.	−
UK	n.s.	+	n.s.	−	−	−	−

n.s. – statistically not significant

The boxed effects from the main diagonal can be interpreted in terms of the domestic brand bias. There is no domestic brand bias present except possibly in Germany and France, but most other European cars are priced higher in these two countries. This is also true for Italy, where the only insignificant coefficients are those for Italian and British made cars. Italy was one of the countries cited in the previous literature as having a domestic brand preference, but Italian cars do not seem to be priced any higher in Italy, and they are definitely cheaper than other European made cars. Note that we have already controlled for any aspects of income, brand, and physical characteristics. The remaining differences can only be interpreted as different preference for cars in these, or as a result of collusive behavior. We can relatively easily dismiss an argument based on an overall higher preference for cars in these three countries. As mentioned before, foreign cars are priced lower in all these three countries on average. However, since almost all European cars are priced higher, this can only mean that the remaining models in our sample (mainly Japanese and Korean cars) are way cheaper than European cars. Hence, we cannot argue that German, Italian, or French consumers value cars higher than other European consumers. There might be a stronger preference for European cars, but this is unlikely. A more plausible explanation is that a strong collusive behavior is at work in these three countries. Firstly, note that with

the exception of Sweden, all other brands, regardless of their country of origin, are owned by German, Italian, or French groups. Fiat owns Fiat and Alfa Romeo, PSA owns Peugeot and Citroen, and Volkswagen owns Volkswagen, Audi, Seat, and Skoda. Also, within each one of these countries, a very small number of groups controls virtually the entire market for automobiles. Fiat in Italy, PSA and Renault in France, and Volkswagen, BMW, and Daimler in Germany control virtually the entire domestic market, or at least the volume producers segment. We're talking about 6 groups that control approximately 70 percent of the Western European market. It would be a valid argument to assume that these 6 groups, or a smaller subset of them, can easily collude and set prices to maximize joint profits. This is done in both ways mentioned earlier. First, within a given country, all colluding firms increase prices from the competitive level where other firms (mainly Japanese) operate. Then, across countries, foreign colluding producers increase their prices even more, above the price of the domestic colluding partner, reducing competition in return for a similar treatment in their own home countries. These types of behavior can be easily observed in table A1 in the Appendix, where the actual magnitudes of the effects are presented.

Moving on to the other destination countries, note that in The Czech Republic and Spain, most prices are not significantly different than in the rest of the European Union. In terms of the domestic brand bias, these countries actually have a domestic preference for foreign cars, and this is especially true with the Czech Republic, where Skoda is significantly cheaper that other cars. Besides the lack of a preference for domestic cars, these countries do not have a strong domestic industry, and even more so, their brands are owned by the Volkswagen group. Hence, these two countries are practically identical, from a market structure perspective, to countries with no domestic producers and the pricing picture perfectly reflects this.

On the other hand, Sweden and the UK seem to be highly competitive countries, with much lower prices across the board. In the UK, this might be the direct result of the market structure. The UK has a large number of domestic automobiles manufacturers, but most of them belong to the premium class. The UK is still home to seven volume manufacturers, but their combined market share is nowhere near the figures present in France or Germany. For instance, while PSA and Renault have more than 50 percent market share in France, in the UK more than 75 percent of the market is shared by many foreign firms, with the largest group only controlling slightly more than 10 percent. As a result, the market is extremely competitive with American, European, Japanese, Korean, and British firms aggressively cutting down prices to stay in business. In Sweden, on the other hand, the lower prices are most likely the direct result of the financial struggles of the two main producers – Volvo, and especially Saab. During 2009-2011 Saab had tremendous difficulties in operations. It switched owners a couple of times, and actually filed for bankruptcy after more than three years of fighting for survival. Not unlikely to what the American companies experienced in the recent years, Saab had to drastically cut prices in order to sell inventory and stay afloat.

In order to further clarify the collusive patterns among the top three auto manufacturing groups, I disaggregate the country of origin dummies into brand dummies and interact them with the destination country dummies in the same way as before. The relevant results are presented in Table IV, where the boxed effects represent the alleged domestic brand bias. Since different local producers who do not belong to the same group might actually behave differently, we are primarily interested in finding cells that are not robust with the previous estimation that pooled together all the brands produced in a given country. While most

results are consistent with previous findings, a few interesting differences emerge.

Table IV: Brand by Country Interactions

	Italy	Germany	France	Sweden	Czech Rep.	Spain	UK
Alfa Romeo	n.s.	+	+	+	−	−	n.s.
Fiat	n.s.	+	+	n.s.	−	n.s.	−
BMW	n.s.	n.s.	n.s.	−	−	−	−
Mercedes	+	+	+	−	n.s.	n.s.	−
Opel	n.s.	+	+	−	n.s.	−	−
Audi	+	+	n.s.	−	n.s.	n.s.	−
VW	+	+	+	−	−	n.s.	−
Seat	+	+	+	n.s.	n.s.	n.s.	−
Skoda	+	+	+	−	−	n.s.	−
Volvo	+	n.s.	n.s.	−	n.s.	n.s.	−
Saab	+	+	+	−	n.s.	+	−
Citroen	+	+	+	−	n.s.	−	−
Peugeot	n.s.	+	+	−	n.s.	n.s.	−
Renault	n.s.	+	+	−	−	n.s.	−
Mini	n.s.	+	n.s.	−	−	−	−

n.s. – statistically not significant

First of all, in spite of the fact that the main patterns between the three top manufacturing countries are confirmed, only some of the manufacturers price consistently. To be more exact, BMW does not seem to act in a collusive way on any market. BMW models are not differently priced in either Italy, Germany, or France, and are actually priced lower in the remaining four countries analyzed which is a clear sign that BMW is acting competitively across the board. And that is in spite of the fact that BMW is considered a premium brand. Also Opel does not reciprocate the Fiat group in pricing higher on the Italian market. It seems that the VW group and Mercedes are the only two German firms that actively engage in collusion with the Italian group Fiat. Also, the only French group that apparently acts collusively with Fiat is PSA. Renault on the other hand, only seems to reciprocate high prices with the German firms. It is very possible that both Renault, on the French market, and Opel and BMW, on the German market, free ride on the other domestic producers. If say PSA enters a collusive agreement with Fiat, and Fiat does not compete aggressively on the French market, then Renault can benefit from it without need of reciprocating. Same goes for Opel and BMW in Germany, they could take advantage of a VW-Fiat agreement without needing to compete less on the Italian market. Of course this hurts Fiat on its domestic market, which is supported by the finding that in spite of a domestic brand bias, Fiat does not enjoy the same kind of price control that German or French firms enjoy on their respective domestic markets.

It therefore comes with no surprise that Volkswagen, Daimler, PSA, and Fiat seem to be the major groups engaging in price fixing strategies and collusive behavior. These are the same groups that have been previously fined serious amounts by the European Commission for uncompetitive practices related to their dealership systems. Collusion is extremely hard to prove, but it is easy to understand that firms who engage in collusion benefit more from

artificial market segmentation.

A second interesting result points to at least two possible collusion patterns that were previously not observed. We already mentioned that the British and Swedish markets were found to be extremely competitive, and the main pattern persists when we disaggregate the local producers. However, two differences can be observed: Alfa Romeo and Fiat models are priced significantly higher on the highly competitive Swedish market and Saab cars are also priced higher on the reasonably competitive Spanish market. If we look at the reciprocal links we also observe Volvo (which otherwise acts extremely competitive) charging higher prices on the Italian markets and Seat pricing above all other European producers (except Alfa Romeo) in Sweden. These patterns seem to suggest collusive agreements between Volvo and the Fiat group on one hand, and between Saab and Seat on the other.

Without claiming to be a clear cut proof, the pricing patterns we observe support theories of collusion between the major manufacturing groups in the European Union. The major players pointed by the pricing data seem to be the same firms which were previously penalized for their uncompetitive practices.

4.   Conclusions

This paper shows evidence that significant demand side differences and local market conditions across member states of the European Union allow manufacturers to profit from engaging in international price discrimination and collusive behavior. This paper however diverges from the previous literature which points at the domestic brand bias as being a primary force that drives prices apart. We show that there is no domestic brand bias in most of the European countries. We also point to some pricing patterns that argue the presence of a domestic brand bias even in Germany and France, which are the only two countries where domestic cars are priced higher. Pricing patterns that resemble collusive behavior are observed for the major manufacturing groups in Italy, France, and Germany. The United Kingdom on the other hand, which was previously singled out as being one of the most expensive markets, turns out to be one of the most competitive markets after controlling for income differences. Which as mentioned, should come as no surprise when considering the market concentration levels in the UK versus the rest of the EU. This clearly shows the importance of accounting for cross country heterogeneities. This paper also shows evidence that local producers clearly affect the competitive balance on domestic markets, but the predominant effect on price is the effect through foreign cars and not through domestic cars as it is commonly thought.

We urge the audience to take the results regarding collusive behavior with a bit of restraint. Collusion is almost impossible to prove, and this paper does not claim it found the definitive proof. Instead, we merely point out some pricing patterns consistent to collusive behavior. We acknowledge the fact that there might be additional effects not being considered in the current analysis, and further research has to be developed to address this important question. We believe however that the results are suggestive, and they can be a starting point for future investigations.

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Appendix

Table A1: Magnitudes of the Country by Country Interactions

	Italy	Germany	France	Sweden	Czech Rep.	Spain	UK
Italy	455.9	1232.71**	1058.61**	558.09	-1548.07**	-638.78	-1374.1**
	(352.73)	(388.38)	(273.78)	(778.77)	(489.2)	(426.67)	(480.43)
Germany	535.82*	1227.1**	533.2*	-5514.64**	-931.65	-510.73	-8887.77**
	(225.89)	(292.9)	(227.27)	(943.85)	(814.16)	(393.55)	(1598.93)
France	527.4*	1944.55**	2082.32**	-2651.16**	-1497.43	-407.34	-4091.59**
	(266.26)	(332.5)	(375.69)	(572.23)	(800.26)	(353.35)	(947.06)
Sweden	1367.59**	1919.38**	1298.82**	-5178.16**	-327.6	639.16	-8879.76**
	(421.42)	(738.73)	(490.19)	(1125.23)	(969.87)	(485.38)	(1537.02)
Czech Rep.	706.35**	1239.16**	1220.77**	-1232.04**	-857.32*	-294.73	-2069.64**
	(244.62)	(174.45)	(236.89)	(385.26)	(356.38)	(284.59)	(427.93)
Spain	518.83**	1250.64**	1061.75**	-188.23	616.66	-668.25	-1339.83**
	(146.9)	(322.15)	(221.22)	(280.37)	(434.75)	(362)	(253.21)
UK	-137.17	415.64*	-316.25	-2742.56**	-1650.33**	-1345.24**	-4233.16**
	(154.75)	(175.81)	(168.78)	(209.9)	(365.08)	(279.93)	(191.65)

* - significant at 5% level

** - significant at 1% level

Table A2: Magnitudes of the Brand by Country Interactions

	Italy	Germany	France	Sweden	Czech Rep.	Spain	UK
Alfa Romeo	253.32	885.89**	1431.29**	898.63**	-2082.24**	-1327.72**	178.21
	(144.53)	(165.12)	(162.73)	(206.65)	(363.21)	(274.99)	(188.37)
Fiat	506.68	1319.25**	965.65**	472.74	-1428.38**	-466.36	-1762.18**
	(437.14)	(468.92)	(310.27)	(986.7)	(544.47)	(464.71)	(367.62)
BMW	-378.31	392.46	67.27	-6662.6**	-3109.27**	-1041.15*	-10957.82**
	(245.3)	(510.87)	(485.16)	(1242.99)	(766.63)	(473.92)	(2104.96)
Mercedes	1223.89**	1408.79**	814.87*	-6205.47**	-858.99	-122.48	-12423.89**
	(280.68)	(468.59)	(363.06)	(1444.42)	(639.84)	(388.67)	(3009.82)
Opel	600.59	1823.49**	895.89**	-2660.44**	1693.36	-715.12*	-3779.53**
	(333.97)	(499.24)	(192.69)	(843.59)	(1023.99)	(296.49)	(1115.13)
Audi	1072.39**	1714.46**	597.87	-8097.55**	176.33	-80.39	-10847.47**
	(267.74)	(350.48)	(446.77)	(1810.29)	(1195.25)	(682.54)	(3933.74)
VW	619.65**	1170.72**	603.62**	-725.54*	-1752.41*	-319.89	-2151.46**
	(181.39)	(184.47)	(167.27)	(306.07)	(728.44)	(625.79)	(243.43)
Seat	518.94**	1250.51**	1061.92**	-188.42*	616.38*	-668.09	-1339.84**
	(151.29)	(331.75)	(227.82)	(288.74)	(447.75)	(372.77)	(260.75)
Skoda	706.47**	1239.03**	1220.94**	-1232.23**	-857.59*	-294.57	-2068.65**
	(251.91)	(179.64)	(243.96)	(396.75)	(367.05)	(293.04)	(440.68)
Volvo	1079.29*	1317.86	1108.26	-4470.41**	-362.77	123.75	-9189.33**
	(514.81)	(775.34)	(697.93)	(1459.76)	(1449.08)	(274.98)	(2324.88)
Saab	1944.47**	3122.03**	1680.44**	-6594.23**	-258.09	1670.43**	-8260.65**
	(144.53)	(165.12)	(162.73)	(206.65)	(363.21)	(274.99)	(188.37)
Citroen	1112.61**	2444.18**	2075.58**	-1808.09**	-154.95	-1058.43**	-3602.51**
	(144.53)	(165.12)	(162.73)	(206.65)	(363.21)	(274.99)	(188.37)
Peugeot	518.01	1871.92**	2059.99**	-2966.02**	-661.21	-138.69	-4425.77**
	(361.88)	(607.77)	(691.81)	(1013.21)	(547.8)	(370.01)	(1609.73)
Renault	249.22	1803.28**	2119.69**	-2600.98**	-3423.84**	-484.32	-3834.89*
	(329.46)	(167.99)	(303.67)	(479.18)	(1303.38)	(439.98)	(1565.21)
Mini	-130.33	422.24*	-309.36	-2736.03**	-1643.89**	-1338.37**	-4226.45**
	(161.66)	(182.84)	(176)	(217.39)	(376.67)	(289.18)	(198.72)

* - significant at 5% level   ** - significant at 1% level

Table A3: Relevant Empirical Variables

Physical Characteristics	
Length	exterior length (in meters)
Width	exterior width (in meters)
Height	exterior height (in meters)
CC	engine capacity (in cubic centimeters)
HP	engine power (in horse power)
NM	engine torque (in newton meter)
Sec100	time needed to accelerate from 0 to 100 km/h (in seconds)
Top Speed	top speed (in kilometers per hour)
MPG	average fuel efficiency (in miles per gallon)
Gearbox	number of transmission gears
AWD	all wheel drive dummy
Diesel	diesel engine dummy
Country Specific Characteristics	
Income	national per capita income (in dollars)
Gini	national income inequality measured by the gini coefficient
RP10	national income inequality measures by the rich to poor ratio
Own Industry	domestic producer dummy
MadeIn	domestic brand bias dummy
Disaggregation Dummies	
One Producer	dummy coded with 1 if there is only one domestic producer
Two Producers	dummy coded with 1 if there are 2 or 3 domestic producers
Six Producers	dummy coded with 1 if there are more than 6 domestic producers
Domestic	dummy coded with 1 if the car is produced domestically
Foreign	dummy coded with 1 if the car is produced in a foreign country
Brand Dummies	a series of brand dummies to capture brand fixed effects
Country Dummies	a series of country dummies for the countries with at least one manufacturer
Interaction Dummies	a series of interaction dummies as explained in the main text