Appendices

Appendix A Data

A.1 Demand Data

We purchased a dataset of trim-level unit sales, prices (MSRP) and characteristics (size, weight, horsepower, fuel type, transmission, wheel base) for nine markets (Belgium, Brazil, Canada, France, Germany, Italy, Spain, UK, US) and five years (2007-2011) from R.L.Polk & Company, a market research firm that got acquired by IHS Inc. in 2013. Data for the years 2007 and 2008 are missing for Brazil and Canada, respectively. Following the common practice in the literature, we aggregated sales to the model level since very small market shares at the trim level create numerical challenges for the BLP inversion. The aggregation used trim-level sales as weights to calculate average model prices and characteristics. We fill in the few cases of missing characteristics (most notably in Brazil), with the characteristics of the same models from the North American market. Prices at local currencies were translated into USD using the average annual exchange rate. In countries with a retail sales tax, we augment this price with the retail sales tax so it approximates the effective price to the consumer. This procedure generated 9,498 observations. We dropped pickup trucks since they constitute a somewhat unique segment in the US. We also dropped observations for 2010-2011 in Canada since information on SUV models sold there in these years was missing. This leaves us with 8,841 observations. Additional data come from OECD (sales tax data), Penn World Tables Version 8 (income per capita in 2005 PPP, price levels of GDP, exchange rates), and the World Bank (Gini coefficients)

All nominal variables in the data, MSRP and gas prices in each market-year, have been deflated to 2005 US dollars to be consistent with the PPP income per capita variable denominated in 2005 US dollars. All variables are first deflated to their 2005 levels using price level time series from the Penn World Tables, and then converted to USD using the nominal exchange rate of the year.

A.2 Supply Data

To locate the production locations of unique model-year combinations in the demand data, we purchased data on assembly plants by manufacturer groups and models between 2007-2011 from Ward's Communications. Assembly countries for model-years present in the demand data but missing in the purchased supply data were collected by research assistants from the Internet. The complete supply data encompasses 52 assembly countries. The models produced in Uruguay belong to the Chinese brand Geely for which fuel efficiency measures are missing. As a result, we drop Uruguay as an assembly location. Also, data for Kenya and Bangladesh overlap in that Toyota Land Cruiser is the only model produced in these countries. Since this leads to multicollinearity in estimating model and production location fixed effects, we drop Bangladesh. This leaves us with 50 countries from which the models in the demand data could be supplied. The countries in which manufacturer groups are headquartered constitute another dimension of the data, which is more easily accessible from online sources. There are 12 headquarter countries associated with the 28 manufacturing groups: China, Germany, Spain, France, the UK, Italy, Japan, Korea, Malaysia, Russia, Sweden and the US.[46] The CEPII dataset (Head and Mayer 2013) provides us with the distances between headquarter and assembly countries, as well as the distance and the contiguity of our nine markets to assembly countries. Bilateral tariff data come from TARIC (EU Integrated Tariff Database), Canada Border Services Agency, USITC and WITS databases. Most of the bilateral tariffs were constant throughout the data period with two exceptions. The entry of Ukraine to the WTO led to a reduction of US tariffs from 10% to the MFN level of 2.5%. EU tariffs to S. Korea decreased from 10% to 3% in 2011 when a free trade agreement became effective. We ignore rules of origin requirements related to the regional value-added content in FTAs: for instance, according to NAFTA rules, a car can be imported from Mexico to the US tariff-free only if the regional value-added content is above 62.5%. The rest is subject to tariff. Unfortunately, systematic model-level data on location-specific value-added is not available. In our cost estimation (subsection 4.5), we make an attempt to account for the fact that only a fraction of an imported car's cost is subject to import tariffs.

In order to investigate the sources of the brand-country fixed effects from the demand estimation, we supplement the demand data with information on brands' years of entry into and the number of their dealers in each of our 9 markets. The year-of-entry data was collected by consulting various sources including the Internet, business history books and companies' public relations agents. Data regarding the number of dealers was collected from Google Maps. There are 331 brand-country observations.

The number of car dealers for a manufacturer brand within a country is collected using Google Places API (`https://developers.google.com/places/webservice/search?hl=en`). This API provides a function called radar search that returns the search query given the key words, place types, center coordinates and radius of the area of interest. The query has detailed information including place id that can uniquely identify a place, coordinates and description. There is a limit to the number of results returned per search (200) and also the radius (50km). We set the keyword to be the name of the manufacturer brand and the place type to be "car dealer."[47] Then we iterated over areas to cover the entire country by choosing different coordinate centers and set the radius to 50km. The area may cover places outside of the country, in which case we removed these results based on their coordinates. There may also be overlapped area search in the search iteration, and we removed the repeated results using place id. To avoid counting dealers of used cars, we did a radar search using used car as the keyword, and deleted a place if its id is found in the used car list.

A.3 Gas Prices

We collected data on unit price at the pump for gasoline, diesel and ethanol in all our markets. Data sources are the websites of the US Energy Information Administration, Natural Resources Canada, European Commission, and the Brazilian National Agency of Petroleum, Natural Gas and Biofuels (ANP). Fuel market shares in each country and year are used as weights in calculating average gas prices.

[46] For two manufacturing groups, Chrysler-Fiat and Renault-Nissan, we assigned each firm a separate headquarter country: Chrysler in the US and Fiat in Italy, Renault in France and Nissan in Japan. During this period, key managerial decisions at Chrysler were still made in Detroit and the merger of the two companies wasn't legally complete until 2014. Similarly, while the Renault-Nissan alliance coordinates global procurement, production and marketing, they still keep their separate management structures and brand identities.

[47] Because Opel is a common location name in some countries, we use "Opel dealer" instead of "Opel" in the search, where "dealer" is translated into the local language.

A.4 Trade Flows and Import Shares in Sales

In Figure 1, we use data downloaded from `wits.worldbank.org` on USD car import values from each source country to each of the nine markets. We work with HS6 product categories associated with assembled cars. This spans all the subheadings under 2007 HS 4-digit heading 8703 (Motor cars and other motor vehicles principally designed for the transport of persons) excluding 870310 (Vehicles specially designed for traveling on snow; golf carts and similar vehicles). These HS product codes are: 870321, 870322, 870323, 870324, 870331, 870332, 870333, and 870390. Trucks are not included in this data as they are classified under HS 8704, "motor vehicles for the transport of goods". This data includes many small flows due to personal imports of automobiles, so we exclude pairs with less than $5 million in reported flows, which amounts to roughly 200 units. The reported results are robust to adjusting this cutoff.

In table 13, we use data downloaded from `wits.worldbank.org` on units of vehicles imported to each of the nine markets. Total units sold by market-year are downloaded from `Marklines.com`.

Appendix B Additional Figures and Tables

B.1 Analysis of Price Discounts

As is well known, transaction prices can differ from the manufacturer's suggested retail price, which introduces some measurement error into our price variable. Also, at least anecdotally, brands are known to differ in their discount policies. In this Appendix section, we analyze whether home brands differ systematically from foreign brands in their discount behavior. We downloaded online car prices for US, Germany, and France during the period December 2015 to February 2016.[48] We analyze discount behavior across the three countries. The left hand side variable is the price discount ($\frac{\text{online price}}{\text{MSRP}} - 1$). On the right hand side, we interact a dummy variable whether a brand is at home with a country dummy and include country fixed effects in the regression. We find that German brands tend to give smaller discounts (note that discount is a negative number so a positive coefficient implies smaller discounts), while French and US brands tend to give larger discounts. Importantly, though, brands do not systematically give larger discounts in their home market than in foreign markets as illustrated by the insignificant results for the home brand variables in the results in columns II and III when global model or brand fixed effects are included. Hence the global brand fixed effects in our demand estimation will absorb differences in the brands' discount behavior.

[48] Aggregate pricing data for the US was taken from *www.truecar.com* on December 22, 2015 in 5 cities (Philadelphia, Los Angeles, Washington D.C., and Dallas) and reflect the base car model. Aggregate pricing data for Germany was taken from *www.autohaus24.de* on January 23, 2016 and reflect the base car model. Pricing data for France was taken from *www.promoneuve.fr* on February 8, 2016 in every region and include car styles and possible optional equipment, where authorized dealers post prices for new cars. Pricing discounts for each country are calculated by first calculating the average price of the car model and MSRP for unique models and then calculating the discount.

Table B.1: Online price discounts

	Separate by country	*Global model fixed effect*	*Global brand fixed effect*
	I	II	III
	discount	discount	discount
Home brand in USA	-0.0173	-0.000689	0.00633
	(0.00846)	(0.0205)	(0.0157)
Home brand in Germany	0.0199	-0.00449	0.00820
	(0.00841)	(0.00970)	(0.00948)
Home brand in France	-0.0390	0.00968	-0.0168
	(0.0108)	(0.0147)	(0.0145)
Observations	803	803	803
Country Fixed Effect	Yes	Yes	Yes
Model Fixed Effect	No	Yes	No
Brand Fixed Effect	No	No	Yes

Notes: Standard errors in parentheses.

B.2 Descriptive Evidence

Figure B.1: Models and market shares by number of assembly countries

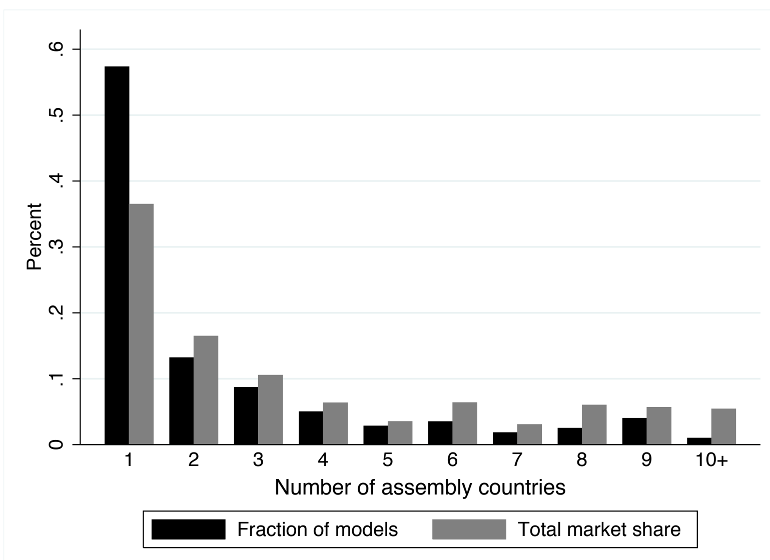

Table B.2: Average characteristics by market and brand origin

	sales weighted **hppwt** of brands from						
Market	DEU	ESP	FRA	GBR	ITA	USA	Other
BEL	62.56	52.68	53.62	71.15	56.33	55.08	58.34
BRA	59.95	.	60.1	90.54	56.32	62.35	77.03
CAN	101.14	.	.	97.55	.	93.82	89.42
DEU	**71.43**	60.07	59.53	77.24	54.98	60.03	61.53
ESP	66.65	**58.88**	55.53	72.41	57.78	58.57	61.96
FRA	64.18	57.89	**54.36**	75.93	57.08	54.46	58.09
GBR	76.06	61.03	57.3	**66.29**	54.27	59.79	64.41
ITA	66.18	54.58	52.95	73.03	**52.77**	54.26	58.69
USA	110.36	.	.	106.5	71.07	**99.81**	94.42

	sales weighted **size** of brands from						
Market	DEU	ESP	FRA	GBR	ITA	USA	Other
BEL	7.87	7.29	7.42	7.35	6.89	7.73	7.4
BRA	6.63	.	7.05	8.53	6.44	6.84	7.76
CAN	8.01	.	.	7.47	.	8.78	8.13
DEU	**7.85**	7.33	7.21	6.91	6.46	7.68	7.29
ESP	7.8	**7.02**	7.6	7.34	6.84	7.75	7.58
FRA	7.64	7.23	**7.29**	6.93	6.46	7.42	7.22
GBR	7.92	7.31	7.19	**7.65**	6.54	7.59	7.32
ITA	7.46	7.2	7.01	7.41	**6.49**	7.2	7.03
USA	8.54	.	.	7.82	5.77	**9.01**	**8.5**

	sales weighted **mpg** of brands from						
Market	DEU	ESP	FRA	GBR	ITA	USA	Other
BEL	33.32	38.28	35.54	33.46	36.83	34.89	34.19
BRA	27.89	.	32.6	23.34	27.77	32.95	29.37
CAN	20.79	.	.	21.93	.	19.94	23.65
DEU	**28.8**	28.88	30.37	29.49	32.34	29.3	29.94
ESP	31.31	**34.62**	34.06	27.26	33.19	32.01	30.99
FRA	33.77	35.72	**36.33**	32.56	35.41	35.57	34.82
GBR	29.7	30.49	32.17	**28.7**	32.83	29.47	31.37
ITA	31.82	32.47	34.31	31.06	**33.63**	34.71	33.29
USA	18.98	.	.	20.93	28.8	**18.91**	**22.55**

Notes: Each cell presents the average level of the characteristic supplied in the market (rows) by brands from country (column), weighted by their sales in that market. Units for horsepower per weight (hppwt), size and miles per gallon (mpg) are the same as in Table 5 in the paper.

Table B.3: Characteristics by market within models

	I	II	III
	$\ln(hppwt_{jmt})$	$\ln(size_{jmt})$	$\ln(mpg_{jmt})$
BEL	-0.276	-0.009	0.253
	(0.006)	(0.001)	(0.006)
BRA	-0.043	0.00308	0.188
	(0.0111)	(0.004)	(0.008)
CAN	-0.0001	0.0008	0.0156
	(0.006)	(0.001)	(0.005)
DEU	-0.195	-0.006	0.157
	(0.006)	(0.001)	(0.006)
ESP	-0.228	-0.007	0.228
	(0.006)	(0.001)	(0.006)
FRA	-0.239	-0.006	0.267
	(0.006)	(0.001)	(0.006)
GBR	-0.210	-0.008	0.189
	(0.006)	(0.001)	(0.006)
ITA	-0.235	-0.008	0.229
	(0.006)	(0.001)	(0.006)
Observations	8841	8841	8841
R^2	0.953	0.985	0.928
Year FE	Yes	Yes	Yes
Model FE	Yes	Yes	Yes

Notes: Standard errors in parentheses. US is the omitted dummy, so all coefficients showcase differences in country means against the US.

B.3 Model Predictions

B.3.1 Marginal Utility of Characteristics

Table B.4 presents the marginal utility of each characteristic to the median consumer within market m, using the estimates in the demand estimates Table 8. Featuring a quadratic term, the marginal utility for size evaluated at sales-weighted average is given by

$$\text{med}_{i,j,t}\left(\frac{\partial u_{jmti}}{\partial size_{jmt}}\right) = \bar{\beta}_m^{sz} + 2\beta_m^{sz2}\overline{size}_{mt}.$$

Marginal utility for horsepower is linear, directly captured by relevant coefficients in Table 8. Marginal utility for fuel efficiency (mpd) varies with income and given by

$$\text{med}_{i,j,t}\left(\frac{\partial u_{jmti}}{\partial mpd_{jmt}}\right) = \bar{\beta}_m^{md} + \pi^{md} log[\widetilde{inc}_{mt}].$$

where $\widetilde{inc}_{mt}$ is median income in each market.

Table B.4: Marginal utility for characteristics to the median consumer

	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
Sale-weighted hppwt	6.21	5.84	9.18	6.66	6.09	5.71	6.56	5.73	9.78
Marginal utility for hppwt	0.22	0.49	-0.01	0.80	0.33	0.34	0.28	0.38	-0.05
Sale-weighted size	6.84	7.57	8.34	7.60	7.59	7.32	7.53	7.00	8.70
Marginal utility for size	6.14	4.44	3.20	4.64	4.50	3.67	3.96	3.97	2.40
Sale-weighted mpd	14.42	6.64	7.68	4.97	7.01	6.73	5.51	6.38	8.19
Marginal utility for mpd	0.82	0.11	0.03	0.15	-0.57	0.05	0.21	-0.13	0.00

B.3.2 Elasticities and Markups

Table B.5 presents the elasticities and cross-elasticities for selected models in the subset of markets where these models compete. Looking at the own-price elasticities, we see they vary mildly across models. When we consider the cross-elasticities, the table illustrates that the model is able to capture the expected competitive patterns. The two luxury models, the Audi A6 and Mercedes E350, compete most strongly with each other. Similarly, Renault Clio, Toyota Corolla, and Ford Focus compete strongly with each other but not with the luxury vehicles.

Table B.6 presents the median (across years) of the implied markups for a selection of models in all countries where those models appear. Intuitively, markups are lowest in Brazil, which is by far the lowest income country in our dataset. Several smaller models such as the VW Golf, Mini, and Ford Fiesta tend to have smaller markups in the United States than they do in European countries. The overall pattern of brands tending to have higher markups in their home country is also apparent in this table, although the popularity of model characteristics and product competition also clearly affects markups.

B.3.3 Trade and Foreign Production Frictions

To get a sense for the magnitude of the estimated trade frictions, we conduct two exercises which calculate the proportion of automobile costs that are due to external shipping and remote produc-

Table B.5: Median own and cross-price elasticities for select models

	Audi A6	Ford Focus	Mercedes E350	Renault Clio	Toyota Corolla
Audi A6	-14.687	0.034	0.433	0.007	0.021
Ford Focus	0.064	-14.473	0.029	0.261	0.471
Mercedes E 350	0.230	0.006	-15.727	0.003	0.001
Renault Clio	0.008	0.311	0.001	-14.090	0.028
Toyota Corolla	0.003	0.483	0.001	0.269	-14.962

Notes: This table shows the substitution elasticity of models in the row with respect to the prices of models in the column. Each entry represents the median of elasticities across country-years.

Table B.6: Median markups of select models across years (percent)

	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
Audi A4	5.8	9.1	8.0	9.8	8.5	9.9	9.3	8.3	9.3
Audi A6		9.0	8.2	8.7	8.2	9.6	9.4	7.7	11.4
BMW 530		7.8		6.7	6.7	8.7	8.8	7.4	10.6
BMW X3		8.1	8.8	7.0	7.1	8.8	8.8	7.3	11.4
Chrysler 300		6.8	9.2	5.6	6.5	8.1	8.3	6.3	10.9
Ford Fiesta	5.4	8.8		9.8	8.2	9.3	8.9	8.8	7.9
Ford Focus	6.0	8.2	8.8	7.7	7.8	8.8	8.9	8.0	8.1
Honda Accord	6.4	7.2	9.1	6.6	6.9	8.3	7.7	6.7	9.8
Honda CR-V	7.8	7.4	9.6	6.6	7.1	8.7	7.9	7.0	9.9
Jaguar XF		6.9	8.0	5.5	6.1	7.7	8.8	6.0	11.9
Jeep Grand Cherokee	6.8	6.8	10.0	5.8	6.4	8.0	8.3	6.3	13.0
Lexus RX 450		5.8	6.9	4.8	4.9	6.8	6.9	5.2	8.5
Mercedes E 350		7.1	7.7	6.8	6.5	8.4	8.2	6.4	12.3
Mini New Mini	6.7	7.9	7.9	7.8	7.4	8.4	7.6	7.4	7.5
Renault Clio	4.6	9.5		9.7	8.6	12.3	8.6	8.6	
Toyota Corolla	5.7	8.0	10.3	8.0	7.5	8.5	8.7	7.9	8.9
Toyota RAV-4	6.7	7.5	9.3	6.6	7.0	8.7	7.8	7.2	10.2
VW Golf	6.8	9.4	9.0	11.4	8.8	9.6	9.1	8.6	7.6
VW Passat	6.0	9.1	8.2	10.2	8.8	9.5	8.9	8.6	9.2
VW Tiguan	8.3	9.6	8.8	10.5	9.1	10.3	9.6	8.8	10.0

tion, and showcase how these quantities vary across brands and countries. Note that this analysis computes costs actually paid in overcoming production frictions. It is not capturing the impact of production frictions that firms endogenously avoid (e.g., sourcing locally to avoid high tariffs and shipping costs). In the Section 5, we conduct a series of counterfactuals which allow firms to re-optimize production decisions when frictions are removed.

Table B.7 reflects the percentage of the total cost that is directly related to external shipping and domesticity (but not including tariffs). In this exercise, we use the estimates from column IV of Table 12 to calculate the proportion of costs paid that are due to shipping from an international location. That is, we calculate the change in total costs when we set the domestic dummy equal to one and the distance between the assembly countries and the destination market equal to the internal distance of the destination market. This calculation keeps tariffs, sourcing locations, and

Table B.7: Weighted average external shipping cost (assembly to market cost, including domestic assembly effects) as percent of marginal cost

	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
Fiat	0.0	5.0		2.5	2.8	2.4	4.0	1.4	2.5
Ford	0.2	3.3	0.6	1.4	2.7	2.1	3.7	2.8	0.2
GM	0.2	4.1	0.6	1.3	2.1	1.9	1.7	2.1	0.2
PSA	0.4	4.4		2.2	1.4	1.3	3.2	2.2	
Toyota	0.3	5.6	0.9	3.2	3.5	2.4	3.7	2.8	1.1
VW	0.2	3.9	2.5	1.2	1.5	1.9	3.1	2.0	1.6

the distance between assembly and headquarters the same. We see some variation by firm and country, ranging between 0 percent (Fiat in Brazil) to 5.6 percent (Toyota in Belgium) of the marginal cost. As we would expect, these costs tend to be relatively low in the firm's home country, despite the fact that even home firms import at least some proportion of their cars from abroad, generating positive external shipping costs. However, in Brazil, where many firms have local plants targeting South American markets, average shipping costs are actually lower as a share of costs than in home countries.[49]

Table B.8 carries out a similar exercise by computing the proportion of costs due to sourcing from assembly locations outside the firm's headquarter country. In this case, we compute the proportion of additional costs from assembling cars outside of the home headquarter country as a proportion of the overall cost. Not surprisingly, these costs tend to be smallest in the firm's home country, although they are not zero since, again, firms source some models in home markets from abroad. These costs range from about 0 to about 1 percent of marginal costs of supplying a model to a market. As with shipping costs, the case of Brazil is especially interesting since remote assembly costs tend to be highest there. This is the flip side of the low shipping costs for the Brazilian market observed in Table B.7. Firms are endogenously choosing to locate assembly locations in Brazil, incurring remote production costs instead of paying higher shipping costs and high import tariffs to access the Brazilian market.

Table B.8: Weighted average remote production cost as percent of marginal cost

	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
Fiat	0.8	0.3		0.3	0.3	0.3	0.4	0.2	0.6
Ford	0.4	0.3	0.0	0.3	0.3	0.3	0.3	0.3	0.0
GM	0.4	0.4	0.0	0.4	0.4	0.4	0.4	0.4	0.0
PSA	0.8	0.2		0.3	0.2	0.2	0.3	0.3	
Toyota	1.0	0.5	0.8	0.6	0.5	0.6	0.5	0.6	0.6
VW	0.9	0.2	0.6	0.2	0.4	0.3	0.3	0.3	0.6

[49] It is also interesting to note that General Motors has its lowest average shipping costs to European markets in Germany, where its Opel subsidiary is based.

B.4 Counterfactuals

The following tables present market shares from the baseline model (which exactly matches share and price data at the model level) and the counterfactual scenarios we consider. Data is aggregated according to brand nationality.

Table B.9: Data: average area-level market shares of brands across markets (%)

	Data/Baseline								
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	31.0	8.9	34.1	8.3	11.3	6.6	15.9	11.6	39.6
EU brands	56.6	75.7	8.5	77.0	70.6	82.6	62.8	74.0	9.5
JPN brands	8.3	11.3	48.3	10.9	13.1	8.8	16.9	11.5	42.9
Other brands	4.2	4.0	9.1	3.7	5.1	2.0	4.3	2.9	7.9
Home brands				55.4	9.0	52.3	18.2	30.3	39.6

Table B.10: Supply counterfactuals: percentage point changes of average area-level market share of brands across markets

All tariffs eliminated									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	-8.5	0.7	-5.3	1.1	1.8	0.3	2.3	2.0	-2.7
EU brands	-18.7	-4.6	2.9	-5.4	-7.2	-2.1	-7.4	-5.7	2.1
JPN brands	-3.5	3.0	0.4	3.6	4.0	1.3	4.2	2.9	-0.4
Other brands	30.7	1.0	2.1	0.7	1.3	0.4	0.8	0.7	1.0
Home brands				-5.3	-4.0	0.3	-6.0	-3.6	-2.7
No international trade frictions									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	-0.5	-0.1	-2.9	0.6	1.0	0.2	1.2	1.1	-3.1
EU brands	-1.2	-2.8	1.5	-4.3	-5.0	-1.6	-4.7	-3.3	1.4
JPN brands	-0.5	2.3	0.3	3.1	3.0	1.1	2.9	1.8	1.0
Other brands	2.1	0.6	1.2	0.6	0.9	0.3	0.6	0.4	0.7
Home brands				-4.9	-3.1	-0.4	-4.4	-2.3	-3.1
No multinational production frictions									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	0.0	0.4	-0.3	0.4	0.4	0.3	0.5	0.5	-0.4
EU brands	0.0	-0.5	0.0	-0.6	-0.5	-0.4	-0.5	-0.6	0.1
JPN brands	0.3	0.1	0.3	0.1	0.1	0.1	0.0	0.1	0.5
Other brands	-0.3	0.1	-0.1	0.1	-0.0	0.0	0.0	0.0	-0.2
Home brands				-0.6	-0.1	-0.2	0.3	-0.5	-0.4
No tariffs, trade or multinational production frictions									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	-11.0	0.9	-8.5	1.6	2.4	0.5	3.3	3.1	-6.2
EU brands	-24.6	-5.6	4.6	-7.0	-9.1	-2.8	-9.8	-7.9	3.9
JPN brands	-3.1	3.8	0.9	4.8	5.4	1.9	5.6	4.0	0.6
Other brands	38.7	1.0	3.0	0.7	1.3	0.5	0.9	0.8	1.6
Home brands				-6.1	-6.3	0.5	-9.6	-5.8	-6.2

Table B.11: Market access and prices of complementary goods counterfactuals: percentage point changes of average area-level market share of brands across markets

Equalize dealer networks									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	-0.8	-0.0	-2.4	-0.8	-0.1	1.1	-0.7	-0.0	-1.4
EU brands	0.8	-0.9	3.3	-1.9	-0.5	-3.3	0.2	-1.0	0.9
JPN brands	-0.0	0.4	-1.0	2.1	0.3	1.8	0.3	0.7	0.2
Other brands	0.1	0.5	0.1	0.6	0.3	0.4	0.2	0.3	0.4
Home brands				-4.4	-0.8	-9.7	-0.5	-2.8	-1.4
All countries have German gas prices									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	-9.0	-0.0	-0.1	0.0	-0.0	-0.0	0.0	0.1	-2.0
EU brands	5.8	0.2	0.1	0.0	1.0	0.1	0.2	-0.0	0.0
JPN brands	2.7	-0.1	0.5	0.0	-0.8	-0.0	-0.1	-0.0	2.2
Other brands	0.6	-0.0	-0.5	0.0	-0.2	-0.0	-0.1	-0.0	-0.2
Home brands				0.0	0.6	0.1	0.0	0.0	-2.0

Table B.12: Demand counterfactuals: percentage point changes of average area-level market share of brands across markets

No home preference									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	0.0	0.0	0.0	1.8	0.4	1.4	1.1	1.2	-9.6
EU brands	0.0	0.0	0.0	-4.9	-0.9	-4.0	-2.6	-2.8	1.8
JPN brands	0.0	0.0	0.0	2.4	0.4	2.1	1.2	1.3	6.6
Other brands	0.0	0.0	0.0	0.7	0.2	0.4	0.3	0.3	1.1
Home brands				-9.8	-3.2	-10.4	-5.7	-7.0	-9.6
No local assembly preference									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	-0.7	-1.5	-2.8	-1.0	-0.6	1.4	1.5	-1.7	-1.2
EU brands	-0.7	-0.2	1.8	-1.8	-2.1	-2.4	0.5	0.0	1.9
JPN brands	0.0	1.3	-0.7	2.2	1.5	0.5	-2.4	1.3	-0.3
Other brands	1.3	0.5	1.6	0.6	1.2	0.4	0.4	0.4	-0.4
Home brands				-6.2	-1.2	-6.7	-3.9	-4.8	-1.2
No local assembly and no home preference									
	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA
US brands	-0.7	-1.5	-2.8	0.4	-0.3	2.9	2.5	-0.7	-10.7
EU brands	-0.7	-0.2	1.8	-6.4	-3.0	-6.3	-1.6	-2.4	4.0
JPN brands	0.0	1.3	-0.7	4.7	1.9	2.5	-1.5	2.5	6.1
Other brands	1.3	0.5	1.6	1.3	1.4	0.9	0.6	0.7	0.6
Home brands				-15.9	-4.0	-16.8	-8.6	-11.3	-10.7

B.5 Model Without Taste Heterogeneity

To assess whether the endogenous match of demand for and supply of characteristics drives home market advantage, we estimated a specification in which consumers in every country have the same mean and variance of valuations of attributes. Table B.13 below replicates Table 8 in the paper when the mean and variance of taste parameters are restricted to be uniform across countries. In this specification, we also make price sensitivity to be invariant to income by restricting $\pi_\alpha = 0$.

We provide two comparisons between our baseline results and the restricted model without income sensitivity and taste differences. Under the baseline, keeping all other brand and car-model characteristics identical, the median consumer's willingness to pay for a home brand over a foreign one with domestic assembly is about $600 in the US. When taste heterogeneity and differences in price sensitivity are shut down, this number drops to $372. In other words, ignoring taste heterogeneity leads to an understatement of consumers' willingness to pay for home brands.

Second, Table B.14 quantifies the effect of demand- and supply-driven components of home market advantage. This enables us to inspect the change in the λ measure for home preference from estimating equation 13 on the counterfactuals, and as in Table 14 in the paper, draw a comparison between the importance of supply vs demand factors in accounting for home market advantage. Evidently, ignoring heterogenous tastes for characteristics does not increase our measure of home preference or change our conclusion on demand factors being more important than supply-related barriers. In fact, the effect of home preference is moderately lower under this specification. This result is consistent with our conjecture in the paper (last paragraph of section 4.2) that brands seem to have successfully adapted their bundles to local tastes. Table B.2 in Appendix B.2 corroborates this point by reporting average characteristics by market and brand origin country. Looking within rows of that table, one notices that bold diagonal values (for matching national brands) do not stand out as outliers compared to other columns. Another way of saying this is that foreign brands do not deviate much from averages in each market. Especially, German brands successfully fit to the American market, and American brands in turn fit to the overall European market. The only exception is Italian brands: they sell uniformly smaller vehicles with low horsepower per weight everywhere, while at the same time driving the average in their home market. This is partially driven by the short history of Italian presence in the US market: Fiat entered the US market very recently after the acquisition of Chrysler, where it only sells the small Fiat 500. It doesn't produce models designed specifically for the American market—either because it has not had the time to develop such models yet or it doesn't find it optimal to do so.

Table B.13: Parameter estimates for the demand model—identical taste for characteristics

	BRA	BEL	CAN	DEU	ESP	FRA	GBR	ITA	USA	Random Coef. Std
HP per Weight	...	...	...	...	...	...	...	...	0.582	0.125
	...	...	...	...	...	...	...	...	(0.139)	(0.160)
MPDCITY	...	...	...	...	...	...	...	...	-0.571	0.692
	...	...	...	...	...	...	...	...	(0.100)	(0.097)
Size	...	...	...	...	...	...	...	...	7.203	0.064
	...	...	...	...	...	...	...	...	(1.777)	(2.329)
Size Square	...	...	...	...	...	...	...	...	-0.204	
	...	...	...	...	...	...	...	...	(0.094)	

Random coef. automobile tastes	Price Sensitivity Parameters	
σ_ι	$\overline{\alpha}$	σ_α
0.579	2.286	0.677
(46.878)	(0.594)	(0.035)

Notes: This table presents the results from a specification that restricts taste for characteristics and price-sensitivity to be identical across countries. Cells with "..." imply that the coefficient is by construction equal to the estimate reported in the U.S. column. The units for HP per weight, size, and price are horsepower per 100 kg, m^2, and 10 thousand dollars, respectively. MPDCITY is miles per dollar in city driving. Brand-country dummies are included. Weighted bootstrap standard errors in parenthesis.

Table B.14: Home market advantage under counterfactual scenarios—identical taste for characteristics

	Coefficient λ	Home Market Advantage (% Chg)
Baseline	1.22	
Supply:		
All tariffs eliminated	1.17	-6.9
No international trade frictions	1.08	-18.7
No multinational production frictions	1.21	-0.9
No tariffs, trade or multinational production frictions	1.06	-21.3
Market access and prices of complementary goods:		
Equalized dealer networks	0.99	-29.0
All countries have German gas prices	1.24	3.4
Demand:		
No home preference	0.94	-34.6
No local assembly preference	0.97	-31.4
No local assembly and no home preference	0.69	-58.6

Notes: This table presents the results from counterfactual exercises for a specification that restricts taste for characteristics and price-sensitivity to be identical across countries. It uses the estimates from Table B.13 and is comparable to Table 14 in the paper. Since prices and market shares exactly match the data at the structural estimates, the baseline λ number follows from estimating equation 13 using the actual data and corresponds to column III of Table 4. The second column reports changes in the home market advantage statistic $(100 \times (\exp(\lambda) - 1))$.