

Product Heterogeneity, Cross-Country Taste Differences, and the Consumption Home Bias

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Introduction

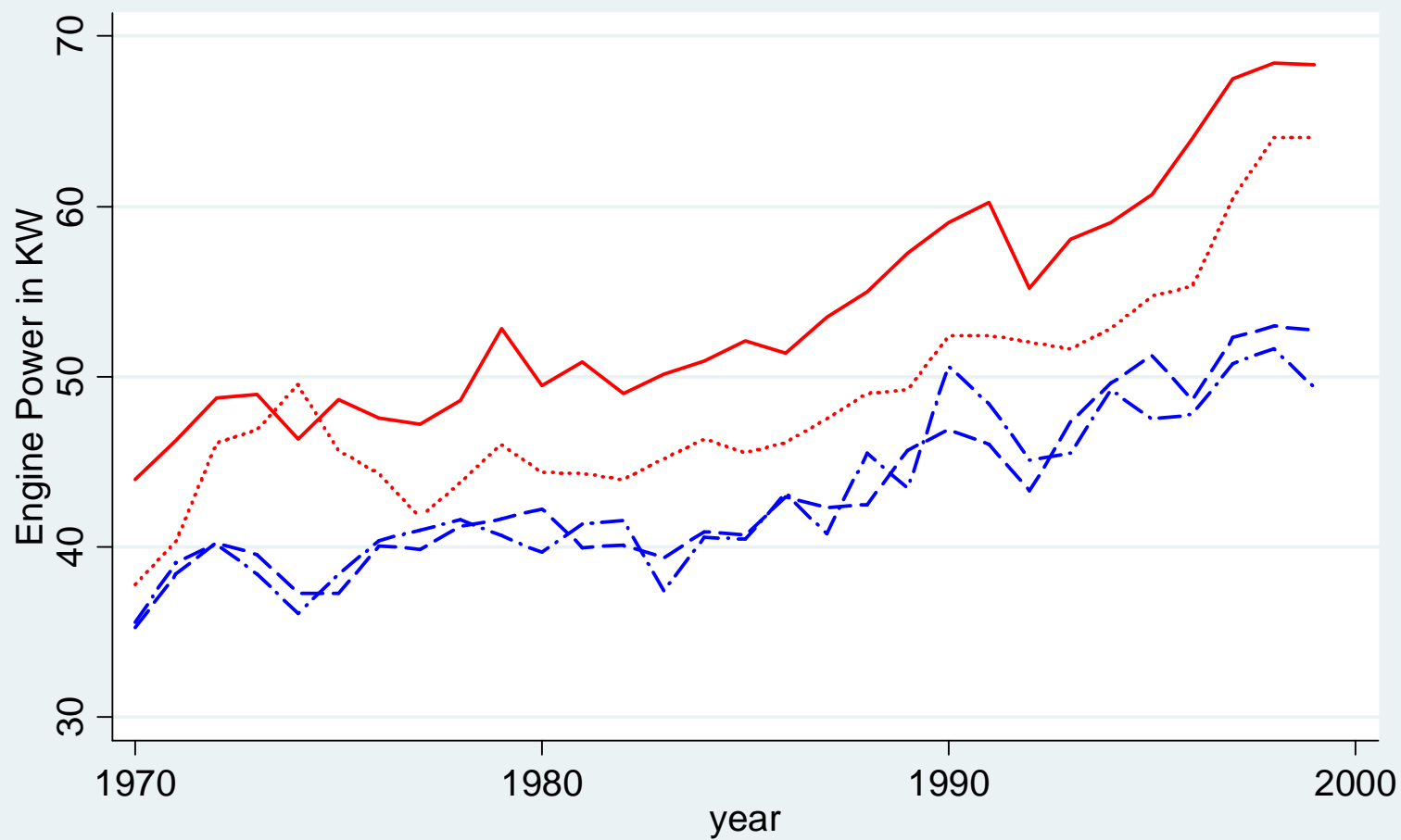
- Home market effect of Krugman (1980) relates cross-country taste differences to industrial specialization and sectoral net trade patterns.
- Linder (1961) and Armington (1969) notions relate cross-country taste differences to the overall volume of trade.
- Q: How are these ideas interrelated?

This Paper

- Observation: there exist sizeable cross-country differences in the type of products that are consumed in the European car industry.
 - such cross-country taste differences over attributes affect the direction of trade.
 - such taste differences also impede the volume of trade.
 - These cross-country taste differences caused a sluggish response of trade volume to liberalization as it took time for each country's industry structure to adapt to the demand structure of the common market.
- I rationalize these patterns in a model featuring two-sided heterogeneity in good attributes and consumer tastes.

An Observation: Cross-Country Taste Differences in the European Car Industry

- Do countries differ in their average "taste"?
- Goldberg and Verboven 01 & 05: European Car industry
 - 5 markets (BEL, FRA, DEU, ITA, UK) - 30 years 70-99
 - attributes: KW, fuel consumption, weight, etc.
- Taste differences? Lets look at average consumption patterns first.



- To identify "tastes", I follow Atkin (2012) and estimate a joint demand system over all car models and interpret country-specific residuals as "taste"
 - Demand model relates quantity of the car model sold in each market to the market size, the car's market-specific price, all characteristics of the car model, and importer GDP.
 - I also account for differences in market toughness for heterogeneous consumers in accordance with theoretical model.
- How do such taste differences affect the direction of trade?

Domestic Consumption and Home market Effect

	(1)	(2)	(3)	(4)
	HP, Only Exp -orter Taste	HP, Only Imp- orter Taste	HP, Taste Measure 1	HP, Taste Measure 2
Sample: regate Trade Flows between BEL, FRA, ITA, GER and UK				
Dependent Variable: 1- 4 Ln of Avg Horse Powers of Bilateral Imports				
Ln Importer Avg. HP		0.267 [0.082]**	0.224 [0.071]**	
Ln Exporter Avg. HP	0.548 [0.116]**		0.54 [0.111]**	
Ln Importer <i>Taste</i> HP				0.361 [0.116]**
Ln Exporter <i>Taste</i> HP				0.457 [0.116]**
Trend	y	y	y	y
Observations	567	567	567	539
Number of groups	20	20	20	20

- Do taste differences also affect the volume of trade?
- Create a measure of the „distance“ of the car's attribute's and the country's average taste. The latter distance is defined in the following way:

$$Diff(HP, j, c) \equiv |HP_j - TasteHP_{\text{importer}}|$$

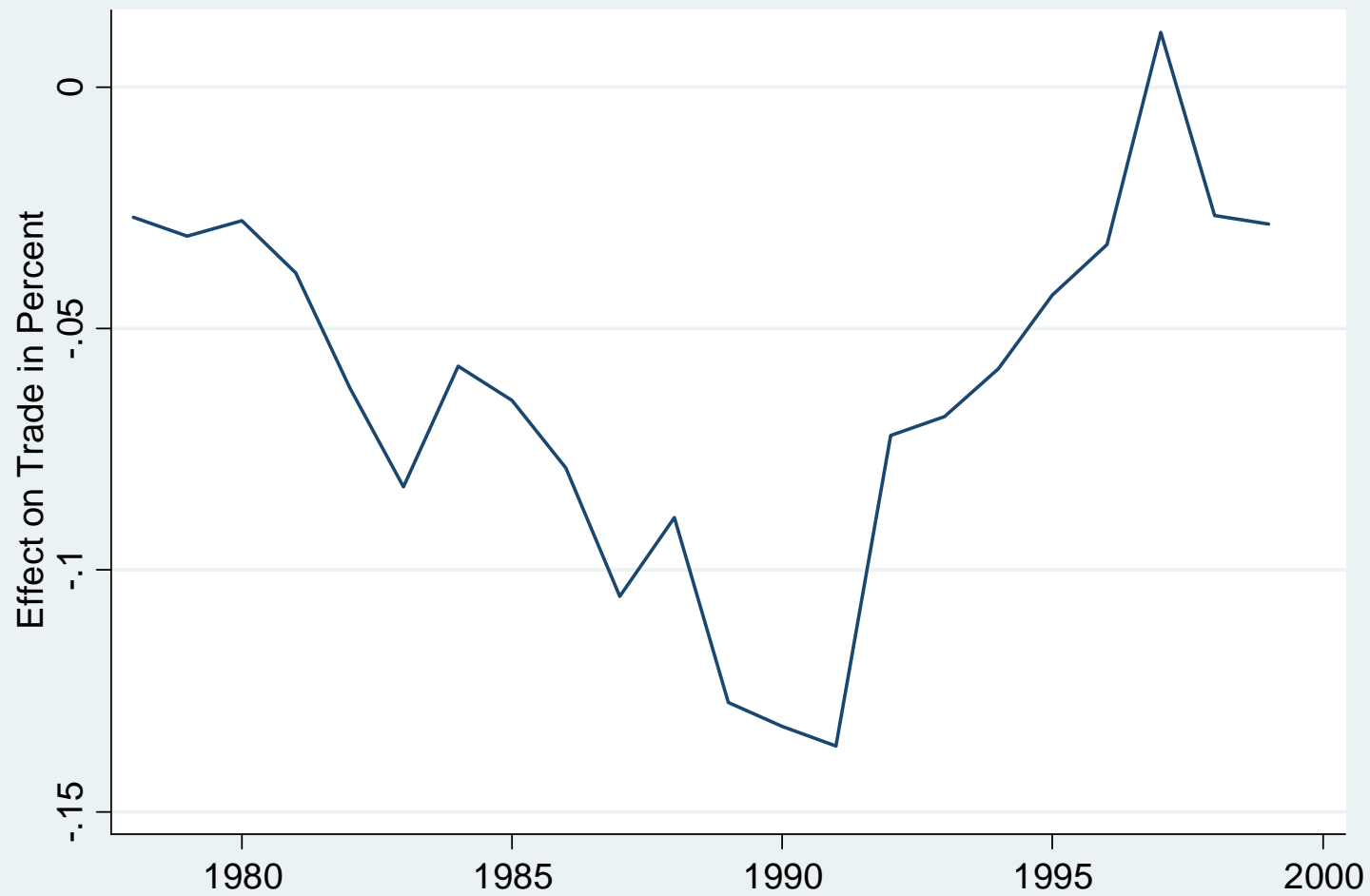
- Condition on sales at home to capture how attributes generally affect sales

Tastes and the Volume of Car Sales

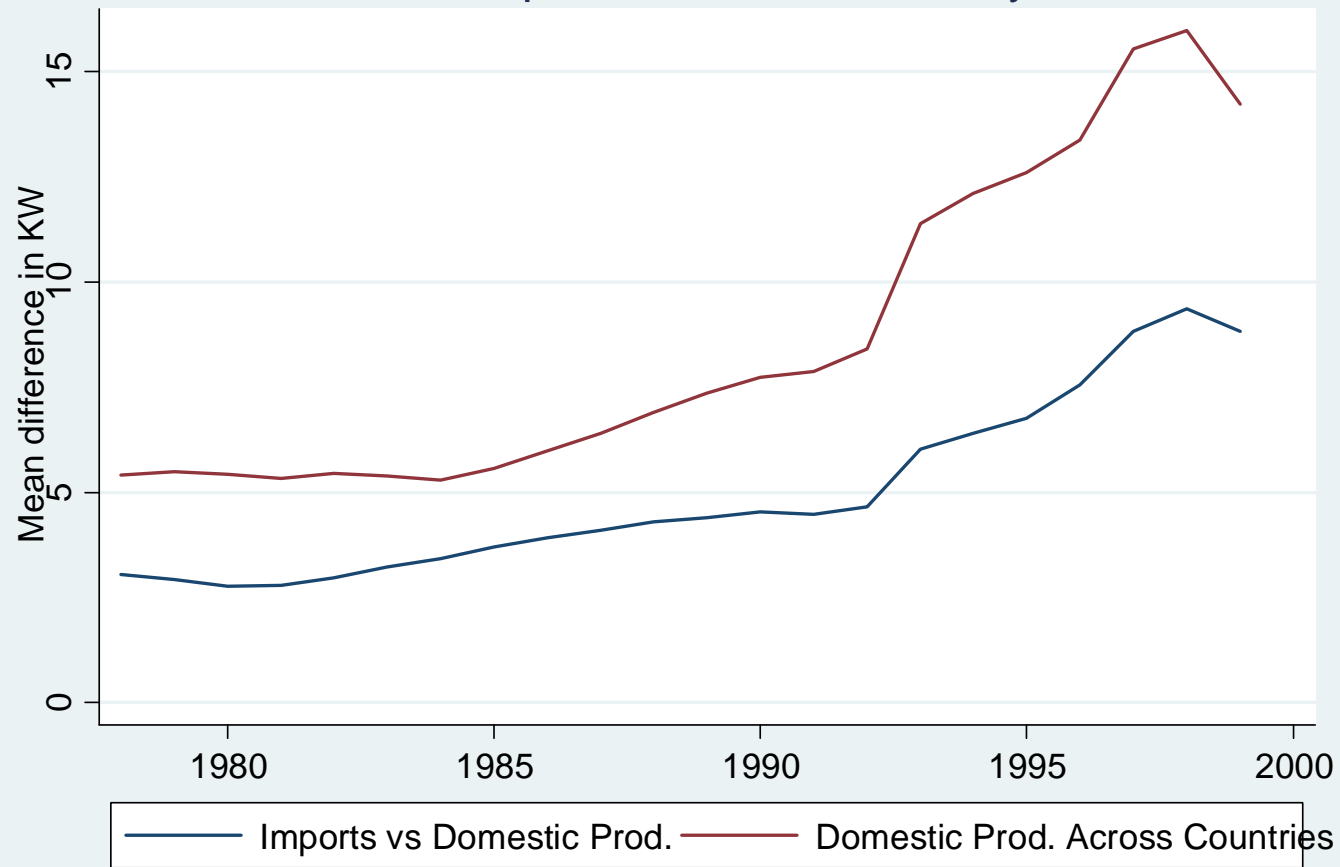
	(1)	(2)	(3)
	Domestic sales	Dist Hp Measure 1	Dist Hp Measure 2
Sample: and exportet to BEL, FRA, ITA, GI			
Dependent Variable: Ln (Q sold in a specfic market)			
Log of Model Sales in Exporter's Market	0.794 [0.0296]**	0.7777 [0.0307]**	0.7849 [0.0302]**
Dist of HP from importer taste (measure 2)		-0.0081 [0.0016]**	
Dist of HP from importer taste (measure 1)			-0.0057 [0.0015]**
Origin & Market Dummies	y	y	y
Trend	y	y	y
Observations	5926	5674	5926
Number of groups	809	770	809

- Next, calculate overall reduction of trade volume over time.

The Reduction of Trade



The Spezialization of Industry



Takeaways

- Taste differences along the product attribute dimension are associated with home-market effects.
- They also reduce the volume of trade.
- The reduction in the volume of trade due to taste differences itself has first increased with liberalization. It then decreased once the industry specialized.
- I next rationalize this in a structural model of demand for heterogeneous products

Towards the Model: Good Attributes and Consumer Valuations

- Goods of heterogeneous attributes face demand from heterogeneous consumers
- Each good j characterized by attribute $a_j \in \{a_L, a_H\}$ with $a_L < a_H$
- Each consumer i characterized by valuation draw for attribute $v_i \in \{v_L, v_H\}$ with $v_L < v_H$
- Fraction π_H of the population has v_H draw.

Utility Function

- Utility from consuming the manufactured good:

$$U_i = \sum_{j \in J} \underbrace{q_{i,j}}_{\text{Quantity, adjusted for:}} * \underbrace{e^{x_{i,j}}}_{\text{A. Firm-consumer specific draw}} * \underbrace{e^{a_j v_i}}_{\text{B. Attribute and Valuation Match à la Mussa and Rosen}^{78}}$$

- Many firms, but in equilibrium, 1 consumer buys from 1 firm only
- Model also has agricultural good that ensures balanced trade.

Main Novel Ingredient: Two-Sided Heterogeneity

- Consider 2 by 2 case, where (cost-adjusted) valuations satisfy:

$$v_H > 0 > v_L$$

- Assortative Matching is key: *H – valuation* chooses *H – attribute*
 - if all firms share same *a*, match exp [*va*] drops out for any *v* => **Pure DS => Krugman (1980)**
 - if all consumers share same *v* model reduces to **Melitz 03 or Baldwin and Harrigan 07 & Johnson 07**
- Attribute-Valuation matching is blurred by $x_{i,j}$

Static Effects of Trade

- Cross-country taste differences modeled as $\pi_H \neq \pi_H^*$. Next allow for trade.
- Relevance of SR: industry exit/entry generally lags exporting (see paper)
- with $n_H^{Autarky} > n_H^{Autarky*}$ foreign exports concentrated in $L - goods$, domestic exports concentrated in $H - goods \Rightarrow$ W-HME & Group-specific gains from trade
- Relative HME notion of Hanson and Xiong 04 and Fajgelbaum et al. 11

SR: Taste Differences and the Volume of Trade

- When do taste differences impede trade?
 - Linder 61: if you don't like it, you don't buy it
 - here: how well are tastes served by domestic industry?
- *Example*: in France $0.6C$ is spent on small cars and $0.4C$ on large cars
- Mass of French carmakers=1 of which n_{large}^{Fra} produce large cars
- In each market segment, firm sales are proportional to expenditures and inversely proportional to No. of competitors

Example: Short Run Trade Volume

- Autarky requires $n_{large}^{Fra} = 40\%$ so that

$$0.4C/n_{large}^{Fra} = 0.6C/(1 - n_{large}^{Fra})$$

- Assume single German firm of negligible mass exports (small=no effect on the relative toughness of competition). **Its type doesn't matter.**

- Now assume that mass of German carmakers=1 and that $n_{large}^{Ger} = 60\%$

$$X_G = \underbrace{0.6}_{\text{No Ger L firms}} \frac{0.4C}{\underbrace{0.4 + 0.6}_{\text{Sales per L} < 0.5}} + \underbrace{0.4}_{\text{No Ger S firms}} \frac{0.6C}{\underbrace{0.6 + 0.4}_{\text{Sales per S Firm} > 0.5}} = 0.48C$$

- Mass of active firms $1 + 1 = 2$, of which 1 German, so $X_G = 0.5C$ is expected.
- Not the result of product heterogeneity itself, but of cross-country taste differences (verify that if $n_{large}^{Ger} = 40\%$, $X = 0.5C$)

Intuition: Short Run Trade Volume

- "If you don't like it, you don't import it" is too simple.
- In autarky, the structure of the domestic industry adjusts to the distribution of consumer valuations such that all firms have equal sales.
- With cross-country taste differences imports tend to increase the toughness of competition more in some segments than in others.
- Since foreign firms tend to concentrate precisely in tough segment (the one they *make* tough), their sales are low compared to domestic firms.

Results II: LR Effects of Trade

1. Increasing specialization (prediction of the home market effect)
2. 1. is associated with increasing volume of trade:
 - Recall: static HB is explained by imports concentrated in one sector while domestic industry tailored to domestic consumers.
 - As domestic firms leave the L-type industry, demand per firm increases in precisely the segment the foreign's industry is concentrated in.

Key Insight: Dynamic Response of Industrial Composition

- Static (Linder): low average valuation is associated with low imports of such goods.
- Dynamic: low average valuation is associated with *over-proportional exit* of domestic firms and low average valuation is associated with high imports of such goods
- Dynamic response also predicts that liberalization results in sluggish export growth (see Yi 03) since industrial composition has to adapt to preference structure of a globalized economy (transition modeled in paper).

Conclusion

- This paper
1. Documents that product heterogeneity is empirically important for our understanding of trade patterns.
 2. Introduces a model of demand for heterogeneous products into the Dixit-Stiglitz-Krugman class of homothetic preferences (*emphasis: two-sided heterogeneity*).
 3. Analyzes the effect of trade liberalization in the presence of product heterogeneity and cross-country taste differences.