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Price convergence in the EU: What can we learn from the car market?

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The dispersion of prices between Member States of the European Union (EU) is a popular indicator of the economic integration of the internal market. Car prices in the EU converged from the 1990s until the year 2003, after which this development ceased. The remaining price dispersion between countries is systematically linked to product features, reflecting manufacturer pricing-to-market.

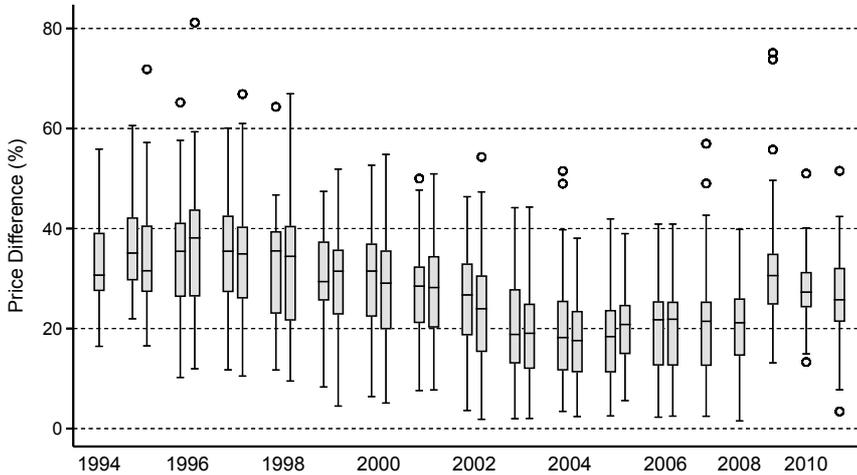
A business can often increase its revenue by tailoring prices to its customers' willingness to pay. Consider a business that wishes to charge one price in one country and another price in another country. Its ability to do so is limited, mainly by what economists call "cross-border arbitrage": if the same product is cheaper in a foreign country, consumers save money by purchasing it abroad instead of purchasing it at a higher price in their home country. The easier it is to shop abroad, the more cross-border arbitrage limits what a business can charge in a particular country. Many directives by the European Commission (EC) aim at the elimination of practices that hinder cross-border arbitrage within the internal market.^[2] The Member States of the EU share an integrated common market, regulations, deep trade relations and, across part of the region, even a common currency. Arbitrage might be expected to make the price for a good in one EU Member State more or less equal to its price in other Member States. But is that really the case? This article concludes that easier arbitrage reduced car price differences until the year 2003. The remaining price differences, however, are substantial and persistent.

Price dispersion and convergence

To answer this question, Dvir and Strasser (2018) look at the market for new cars. They focus on cars for three reasons. First, a car is often among the most significant purchases of tradable goods that households make, and therefore the potential gains from buying abroad are large compared to the effort needed to compare prices internationally. Second, cars are branded items produced in very few locations and their key technical features are relatively easy to compare. Third, most new cars in Europe are built to order, meaning that local inventories will not affect prices much. The study uses a panel of list prices for the most popular car models within each market segment in each EU Member State. The EC sampled these prices twice per year from 1993 until 2006 and once per year from 2007 until 2011. From 2000 onwards, these prices can be matched with a dataset of technical car specifications.

Despite the Single Market, car prices within the EU differ substantially. The pricing of goods as complex as cars at brick-and-mortar dealerships appears to follow different rules or customs than the pricing of branded goods online.^[3] Among EU-15 countries ^[4] the price of a typical car model varied by about 20% in the year 2004 and considerably more in other years. These price differences far exceed transportation costs and so cannot be explained by the cost of physical arbitrage alone.

Figure 1: Car price ranges



Notes: The vertical axis measures 100 times the difference between the maximum and the minimum logarithmised pre-tax price of an identical car model across EU-15 Member States. For a given time period, the distribution of these price ranges is displayed by a box and its whiskers. Boxes represent the 25th-75th percentiles of models, with the horizontal line denoting the median. The whiskers extend over the range of all observations except for extreme outliers, which are shown as circles.

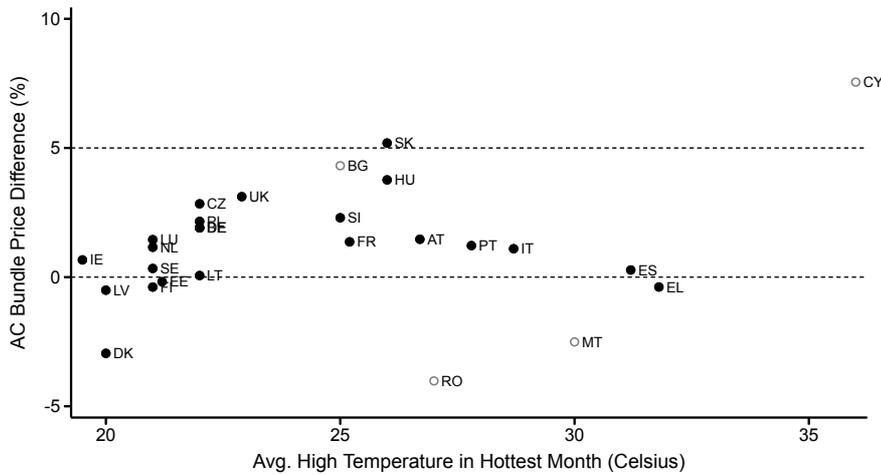
Figure 1 plots the distribution of price ranges across models available in at least 10 countries, i.e. of the difference between the maximum and the minimum price of a given model across all countries where it was on sale. It shows that car prices within the EU were converging until the year 2003.^[5] Since then car prices have shown no sign of further convergence. During the financial crisis, price dispersion even increased, but only temporarily.

During 2002 and 2005 several regulations facilitating further market integration became effective.^[6] Rather than adjusting afterwards, prices appear to have converged beforehand in anticipation of the new regulations. Similarly, while prices varied less within the euro area than across the EU as a whole, this convergence occurred mostly around or before car retail prices started to be quoted in euros, with little evidence of further convergence later on. These findings suggest that car manufacturers adjusted prices proactively, before noteworthy international arbitrage could kick in.

Car features and international price differences

The price differences between countries in Europe are anything but random; they are systematic. Car features are priced very heterogeneously, mirroring the differences in regulation and in consumer preferences within the EU. Such regulatory, market and climatic differences form the basis of international price differentiation.

Figure 2: AC bundle pricing and climate



Notes: Average estimated price difference in per cent when AC is included as standard option. The horizontal axis indicates the average (daily) high temperature in the country's capital in the hottest month measured in degrees Celsius. Sample period 2000-11. Unfilled dots are estimates based on a very small sample.

International price differences are not just based on country differences that are beyond manufacturers' control, but also on different marketing strategies in different countries. This paragraph discusses results from two random effects models. One regresses price dispersion on car features, and the other regresses car prices on car features and offer bundles, both interacted with country indicators. Domestic car brands, for example, are not only positioned and priced significantly differently in their home country compared with other countries, but even the pricing of domestic brands in itself differs between the respective home countries. Further, the more similar a brand is perceived as being to other brands in that country, the lower the price tends to be. Even the market segment (such as the "small car" or "executive car" segment) matters: the more upmarket the segment, the more prices tend to vary across countries. Higher complexity permits marketing a multiplicity of hard-to-compare versions of the same car model. This makes it possible to position an identical product differently in each country, for example by tailoring a bundle of features to local preferences. As an example, consider the estimated average discount (or surcharge) when air conditioning is included as a standard feature relative to when air conditioning is selected from a menu of options. Figure 2 shows that this surcharge increases with the temperature in the country's capital up to a threshold, but is small and constant in hotter countries.

Since 2004 segmentation appears to be driven more by country-specific marketing than by regulatory barriers. In other words, the EU has become integrated from a regulatory point of view, but consists of many segmented marketing regions. The variation in marketing strategies within the EU itself does not

"widen" borders, but mirrors Europe's diversity across regions. An integrated market can contain regional differences in preferences, and often the boundaries of a region with the same preferences coincide with the political borders of a country. This makes countries natural marketing regions, even in an integrated market.

Conclusion

To return to our question, it appears that arbitrage has indeed led to more similar prices for new cars throughout the EU. Their prices converged within the EU from the early 1990s until around the year 2003. Most of the convergence either preceded or accompanied the introduction of the euro and the reduction of regulatory barriers, suggesting that manufacturers adjusted prices in anticipation of policy changes. Since 2004, however, prices have not converged further and still differ widely from country to country. Today the internal market appears to be segmented primarily because of country-specific marketing. Within the euro area the price ranges of complex goods in brick-and-mortar retail are much wider than those of standardised products across single-brand online shops.

The euro area relies on internal adjustment mechanisms, most notably cross-border competition. To assess cross-border competition and economic integration and to properly interpret aggregate price dynamics in the euro area, a deep understanding of cross-country price differentials is necessary. Whereas this article specifically examined the car market, central banks have an interest in studying these issues more broadly. This calls for additional research efforts, analysing European micro price data in particular.

References

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[1] Disclaimer: This article was written by Georg Strasser (Senior Economist, Directorate General Research, Monetary Policy Research Division). The author thanks Paul Dudenhefer, Michael Ehrmann, Geoff Kenny, Silvia Margiocco, Arnaud Mehl and Zoë Sprokel for their comments. The views expressed here are those of the author and do not necessarily represent the views of the European Central Bank and the Eurosystem.

[2] They are often derived from the rules on competition laid down in the Treaty on the Functioning of the European Union (Article 101).

[3] Cavallo, Neiman, and Rigobon (2014), for example, find that the cross-country price differences of standardised goods for sale via online retail outlets within a currency union are small. They also find that the higher the price of the item the smaller the price differences in percentage terms tend to be.

[4] Using only the subsample of 15 EU Member States as of 1995 ensures the set of countries is the same for all periods shown in the graph except 1994.

[5] This convergence was previously noted in Goldberg and Verboven (2004).

[6] For example the Consumer Goods Directive and Block Exemption Regulation in 2002 and the Car Registration Directive in 2005.

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