

Appendix

On the degree of product heterogeneity in the paper industry and its influence on profits

The calculation of the cost side welfare loss rests on the assumption that the industries chosen are homogeneous industries with unique prices. This appendix demonstrates that this is not an unreasonable assumption for the paper industry (we have less evidence for the cement industry). We do this in the following steps. First we show the industries chosen are more homogeneous than other industries, by reporting unit values across products and across markets. Then we show how the paper industry splits into submarkets and again report price differences between markets. Finally we report the expert opinion that price differences usually reflect cost differences and that the firms in our sample are multiplant diversified firms.

Heterogeneity as reflected by unit values: The most comprehensive information about relative homogeneity across different industries is to calculate the unit value (sales per weight) of exports. Homogeneous industries will have a low variation of export prices across countries, and within the industry. The standard deviation of the export prices across the fifteen EU countries is 0.413 for paper and 0.171 for cement. It is 2.499 for shoes, 7.423 for power engines, 23.194 for computers.

The difference between subcategories (total EU exports, within variation) is also low. On the cement market the trade statistics differentiates into two submarkets (SITC 6624 and SITC 6623), the price difference is less than 1:2 namely 0.181\$/weight to 0.344. In the pharmaceutical market the unit values of the subindustries differ between 0.036 and 0.439, in the machine industry between 3.468 and 90.918. Thus in a hierarchy of industries ranked according to heterogeneity paper and cement will be placed at the low end.

Submarket evidence on direct prices: Though we have evidence on the relative homogeneity, paper is not really homogeneous in the sense that one type of paper can be substituted either in demand or in supply by another, see newsprint vs. tissue. An industry study would probably like to define the following submarkets (data are for 1994 total Western Europe consumption, *International Fact & Price Book*, 1996).

TABLE I
EUROPEAN PAPER CONSUMPTION 1994,
IN MILLIONS OF TONS PER YEAR

| | |
|----------------------|------|
| Newsprint | 8.9 |
| Printing and writing | 23.3 |
| Coated | 7.8 |
| Uncoated | 7.9 |
| Woodfree | 8.9 |
| Tissue | 3.6 |
| Packaging paper | 12.4 |
| Kraft liner | 1.6 |
| Board | 6.5 |

The prices between the categories are different but within a span of 1:2. The price for the lowest market segment, newsprint (UK, 1994) is between 450 and 549 BP/ton, coated woodfree writing and printing paper is listed at 562 -765 BP, carton board is priced between 440 -700 BP.

Prices are rather similar around Europe. PPI 1996 publishes a comparable “price watch” for four European countries. Lower quality newsprint was available in all countries at prices between 450 and 478 \$ per ton, the highest quality between 500 and 612 \$. Similar narrow price spans are reported for coated woodfree and for carton board.

TABLE II
PRICES FOR DIFFERENT PAPER PRODUCTS
IN FIVE EUROPEAN UNION COUNTRIES
(4th Quarter of 1994, US\$ per Ton)

| | Newsprint | Coated Woodfree | Carton Board |
|----------------|--------------------------|-----------------|--------------|
| Germany | 450-542 | 1,017-1,263 | n.a. |
| France | 468-612 | 937-1,189 | 702-1,099 |
| Italy | 496-521 | 992-1,178 | 620-1,178 |
| Spain | 478-500 | 1,008-1,269 | 635-1,232 |
| United Kingdom | (689-841) ⁽¹⁾ | 1,072-1,310 | 735-1,149 |

Source: PPI, 1996.

1. UK list prices are subject to heavy discounting. Such discounts render percentage change figures not meaningful.

The multi plant character and the influence of costs: Most of the firms in our sample are firms with many plants usually in different European countries. Usually they are not specialized in one line but supply papers of different qualities. The multi plant character and the presence in at least 2 or 3 of the markets defined above, mitigates differences in sales per ton which could come from product heterogeneity.

As a last piece of information we report that experts in the paper technology strongly underlined that price differences in the paper sold reflect cost differences often in a one to one relationship. Higher value added products are produced at higher costs (material, investment).

Conclusion: Though product heterogeneity is a fact in the paper industry, paper is traded internationally and prices are relative homogeneous between countries and across submarkets. The firms in our sample are large, diversified multi plant firms. Where specialization and different quality allows higher prices, experts assess that the higher price has to be bought by higher costs. If large profit differences for a specific geographical market or for a specific product market exist, the investment and acquisition process of the multinationals would close the differences in the margins in the medium run, if there are no anticompetitive strategies or entry barriers.