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Survival of pharmaceutical products: a cross-countries analysis

N.S. Pereira, Faculdade de Economia, Universidade do Porto, PORTUGAL;

C. Cardoso, ESG, IPCA, PORTUGAL;

Objectivos (Objectives):

The purpose of this work is to understand the determinants of survival of pharmaceutical products and how their importance varies across countries. Departing from differences and similarities between three countries, Portugal, New Zealand and Sweden, we intend to analyze the impact of different regulatory environments on product survival.

The three countries under study implemented, at some point between January 1990 and October 2006 (the time length of our analysis), a reference price system for reimbursement of pharmaceuticals. The reference price systems are different between countries and they are complemented with other measures in order to increase competition or simply to reduce expenditures with pharmaceuticals. Therefore, we intend to test if reference price systems encourage competition, in our case decreasing the rate of survival of pharmaceutical products, or if differences in survival rates result from other complementing measures.

Metodologia (Methodology):

Our dataset includes 3543 products, marketed in Portugal (1612 products), Sweden (986 products) or New Zealand (945 products), between January 1990 and October 2006, representing a random sample of 25% of the complete dataset of products of the three countries. Both non-parametric and semi-parametric survival analyses are presented.

A survival model is developed, taking into consideration the characteristics of the national markets, such as regulation, dimension, degree of competition, and firm and product characteristics. The survival model is applied both on separated estimations for each country, and on estimations using data of the three countries.

Resultados (Results):

Non-parametric analysis shows that there are differences on product survival between countries. We observe that in Portugal pharmaceutical products have shorter survival spells, followed by New Zealand. However, semi-parametric estimations show that, when accounting for market, firm and product's characteristics (not included in the non-parametric estimation), the scenario is completely different: the country with minor probability of survival is New Zealand, followed by Sweden and then Portugal.

The main results from semi-parametric analysis are as follow. First, we find no evidence of intra-firm competition. In fact, it seems that new products do not lead to the exit of existing products within the same firm. Second, we find that inter-firm competition is important to explain pharmaceutical product survival: competition increases the probability of exit, as expected. Finally, we conclude that the introduction of a reference price system do not guarantee, de per se, the improvement of competition pressure and the consequent increase of product exit.

Conclusões (Conclusions):

In this paper, we innovate by presenting cross-countries analysis of product survival.

We draw some methodological conclusions. First, we should be careful when extrapolating the results from single-country studies to other countries, because the results could vary a lot from country to country. Second, our semi-parametric estimations change substantially the insights on product survival from the non-parametric estimation, because it permits the use of multiple explanatory variables. In our case, the semi-parametric estimations permits to isolate the unobserved "country effect" from other characteristics that are known.

We believe that the absence of evidence of intra-firm competition is the consequence of the prevalence of scale or scope economies over the dispute for scarce resources within firm's portfolios.

The introduction of a reference price system does not imply, de per se, an increase of the likelihood of pharmaceutical product exit. This result may help explain the ambiguous results on the impact of reference price system on competition variables of previous papers.