II Portuguese Stata User Group Meeting,

Determinants of generics' market growth

Bruno Duarte Martins

Pedro Pita Barros

Luís Catela Nunes

Nova School of Business and Economics

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Motivation

- Objective included in the National Drug Policy;

- Almost inexistent market ten years ago;

- More than 50 policy measures in 2000-2010 to promote the market for generics;

- No miracle solution to boost it;

- No formal analysis of how effective these were has ever been made;

- Waste of resources and wrong policy making?

- Main conclusion: Most measures were not successful.

Outline

1. Introduction;

2. Methodology;

3. Results;

4. Conclusions.

Introduction

- Part of the project "10 Anos de Política do Medicamento em Portugal" – Available at www.saude-em-rede.org

- Advantages of using generics:

  - Government: Decreases public expenditure and improves the financial sustainability of the NHS;

  - Patients: Same treatment at a lower price.

- Successful policy: Increases sales and/or market shares;

- No cost-benefit analysis;

- Optimistic view - Potential positive bias towards successful policies.

Introduction

- Market variables:

  - Total value of generics sales, current prices;

  - Total value of generics sales, January 2001 prices;

  - Market share of generic sales to total value of pharmaceuticals, in value;

  - Generics sales, in number of packages;

  - Market share of generic packages to total pharmaceutical packages.

- Last two: Notion of quantity, though not perfect;

- Time span: January 2000 until October 2010.

Methodology

- Estimation of a diffusion curve: **Logistic function**

$$y = \frac{K}{1 + \exp\{-(b_1 + b_2 D_t)(t - a)\}}$$

- D_t is a dummy representing the policy measure;

- Logarithms were also used due to heteroskedasticity.

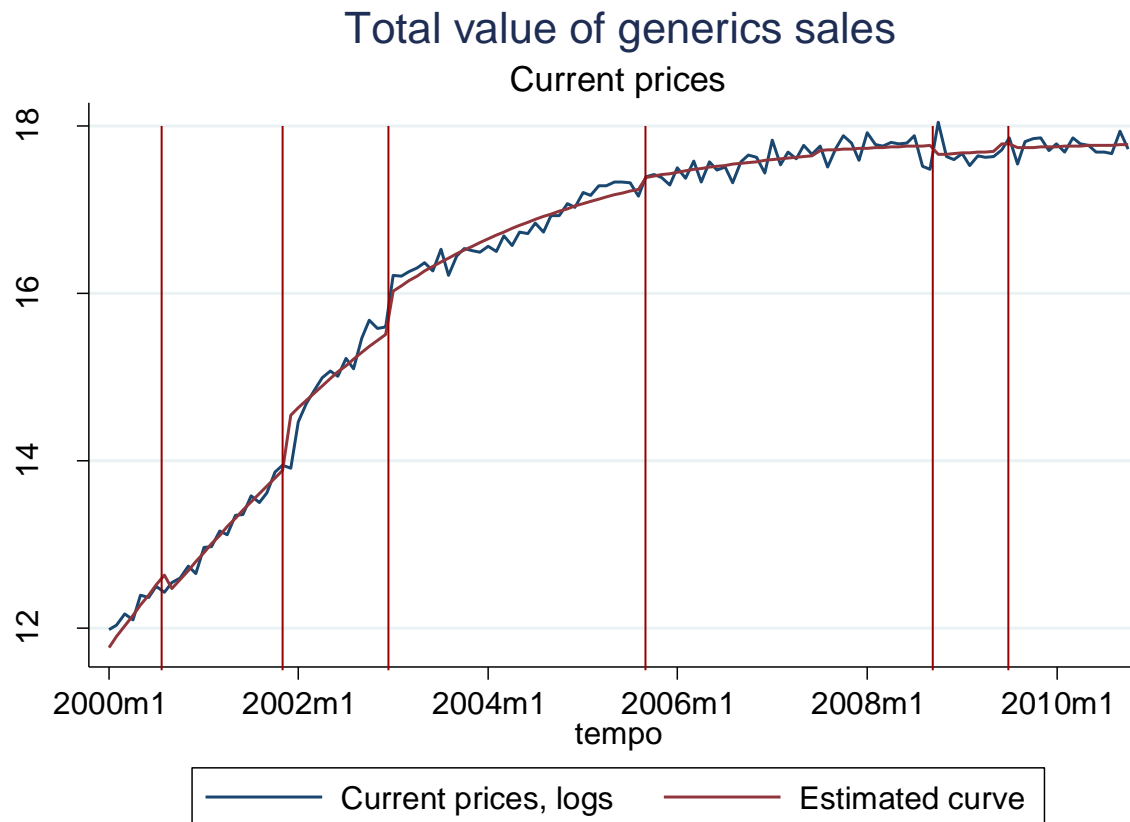**Total value of generics sales**
Current prices
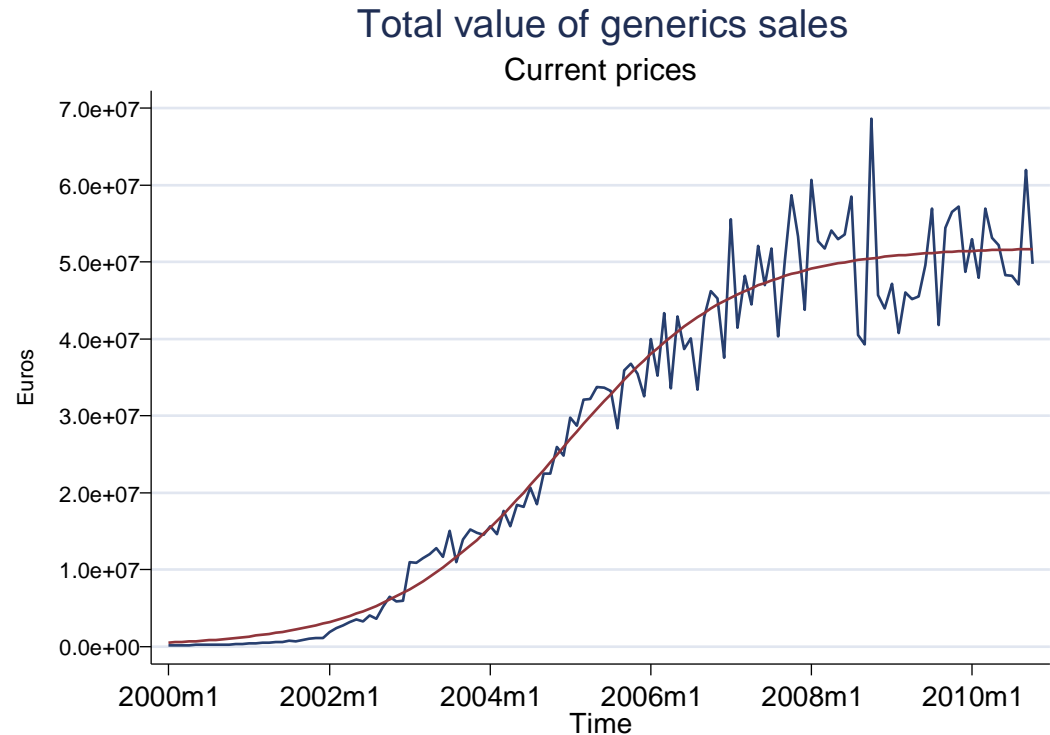
Methodology

- Transition to the *new* curve is not smooth;

- Must distinguish immediate impact (jump) from diffused impact (b_2);

- Relation between time and sign of immediate impact;

- Policy impact interpretation must consider the adoption time.
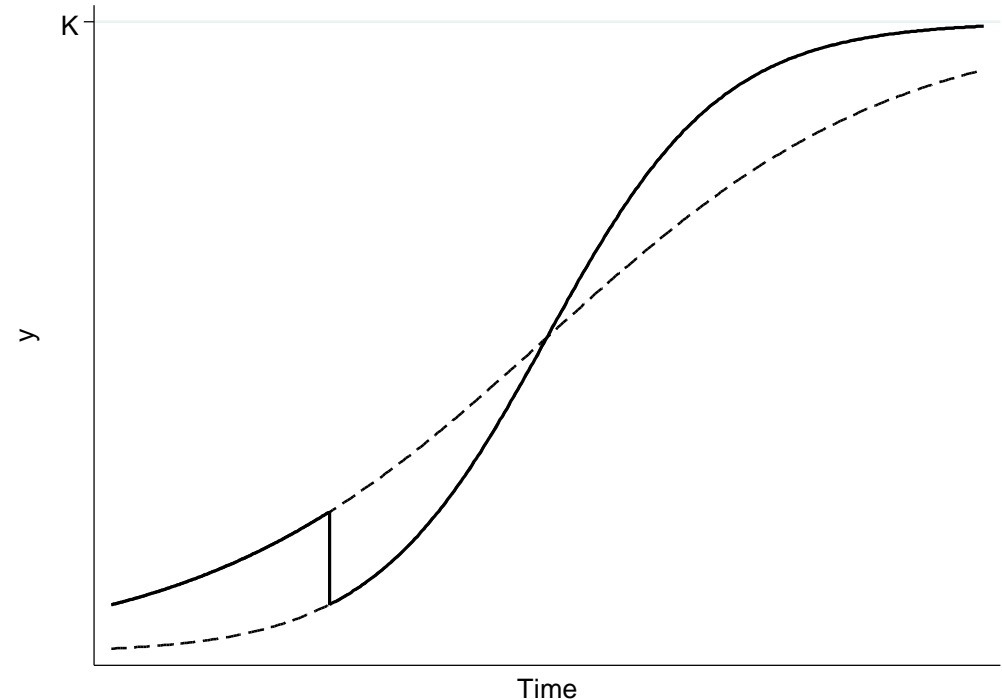
|	t < a	t > a
$b_2 > 0$	Negative jump	Positive jump
$b_2 < 0.$	Positive jump	Negative jump

Results – Total value of generics sales

- Market reaching its highest value: 55€ Million – Near-zero growth rate.

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Results – Total value of generics sales

- What had an effect?
  - Governmental price increases (positive impact) - Dec 2001 and Jan 2003;
  - 30% cut in generic prices (negative impact) - Oct 2008;
  - The liberalization of over-the-counter drugs covered by NHS reimbursement system (negative impact) - June 2007.
- What did not work?
  - NHS price coverage regime (except in one year) and price-definition rules;
  - Price reductions of 6% in all pharmaceuticals - Sep 2005 and Jan 2007;
  - Number of homogeneous groups.
- CPI deflated: Similar results (OTC liberalization does not work).

Results – Market share of sales, in value

Market share of sales to total value of pharmaceuticals
Current prices
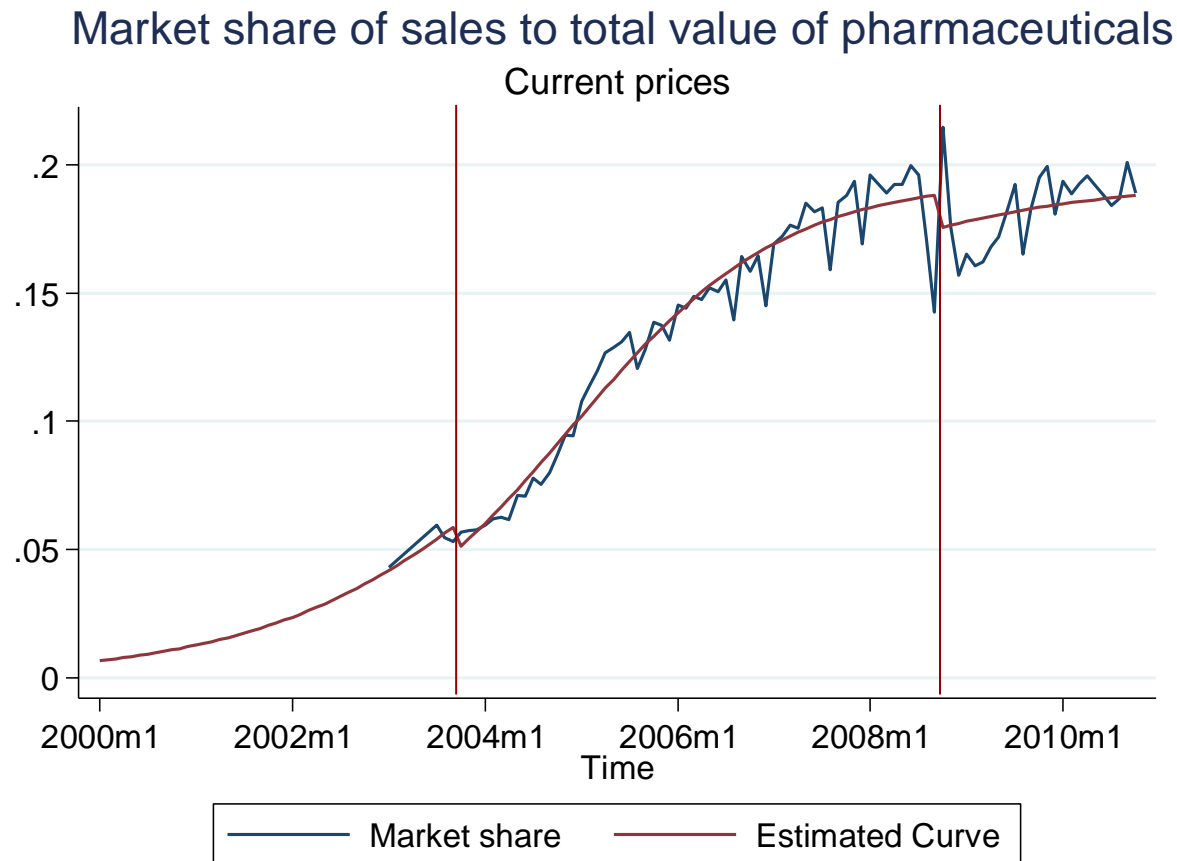
- Market reaching its highest value: 19.5% - Near-zero growth rate.

Results – Market share of sales, in value

- What had an effect?

  - 30% cut in generic prices (negative impact) - Oct 2008;

  - Application of the reference pricing system to coverage on NHS subsystems (positive impact) - Sep 2003.

- What did not work?

  - NHS price coverage regime;

  - Governmental price increases;

  - Price reductions of 6% in all pharmaceuticals;

  - Number of homogeneous groups;

  - The liberalization of over-the-counter drugs;

Results – Generic sales, in # of packages

Total generic sales

Number of packages



Legend: Packages - Logs | Estimated curve
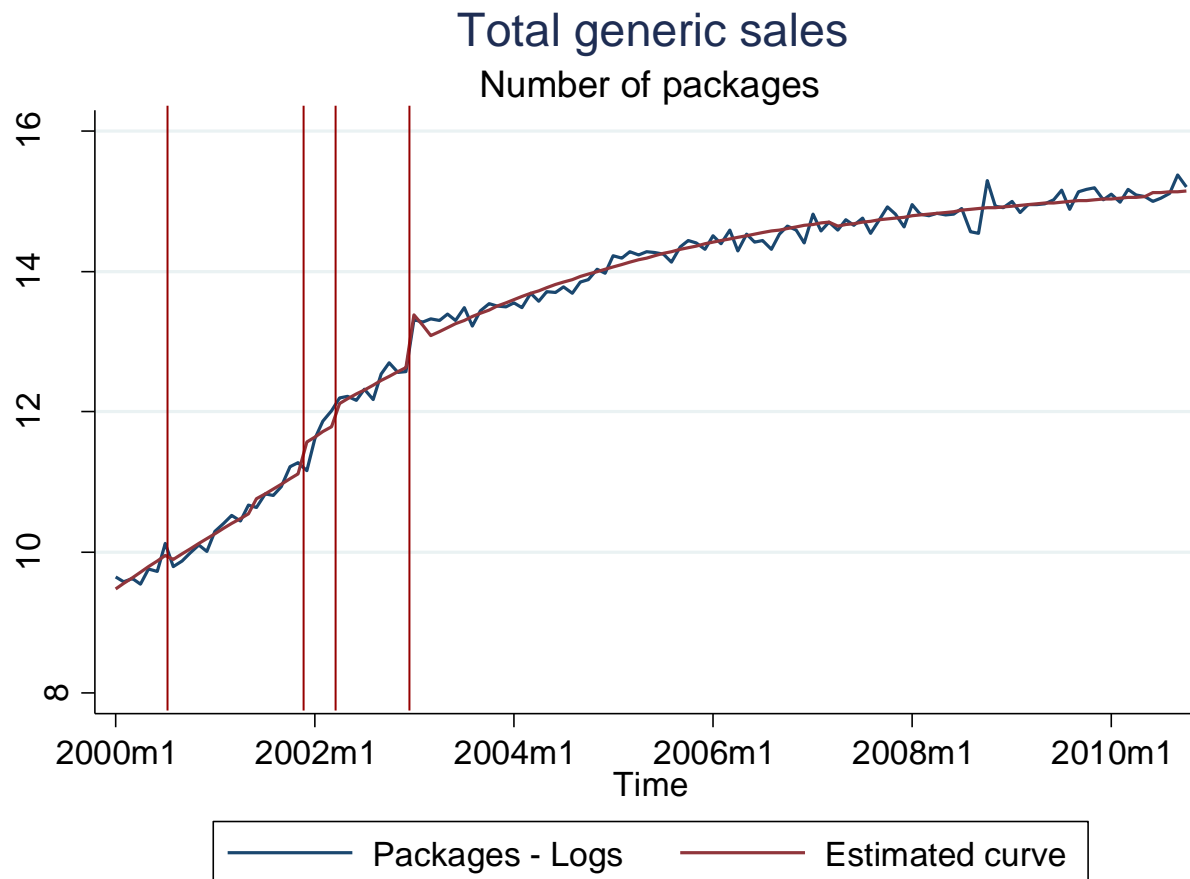
- Market still growing, though more slowly;
- Maximum value: 4.5 Million packages.

Results – Generic sales, in # of packages

- What had an effect?

  - Mandatory prescription through International Nonproprietary Name (INN) (positive impact) - Sep 2000;

  - Governmental price increases (positive impact) – Dec 01 and Jan 03;

  - Obligation of physicians and pharmacy workers to notify patients of the existence of generics (positive impact) – Jan 2003;

  - Reference pricing system (negative impact) – March 2003;

- What did not work?

  - NHS price coverage regime;

  - Price reductions - Sep 2005, Jan 2007 and Oct 2008;

  - The liberalization of over-the-counter drugs – Sep 2005 and June 2007.

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Results – Market share of packages

Market share of generics
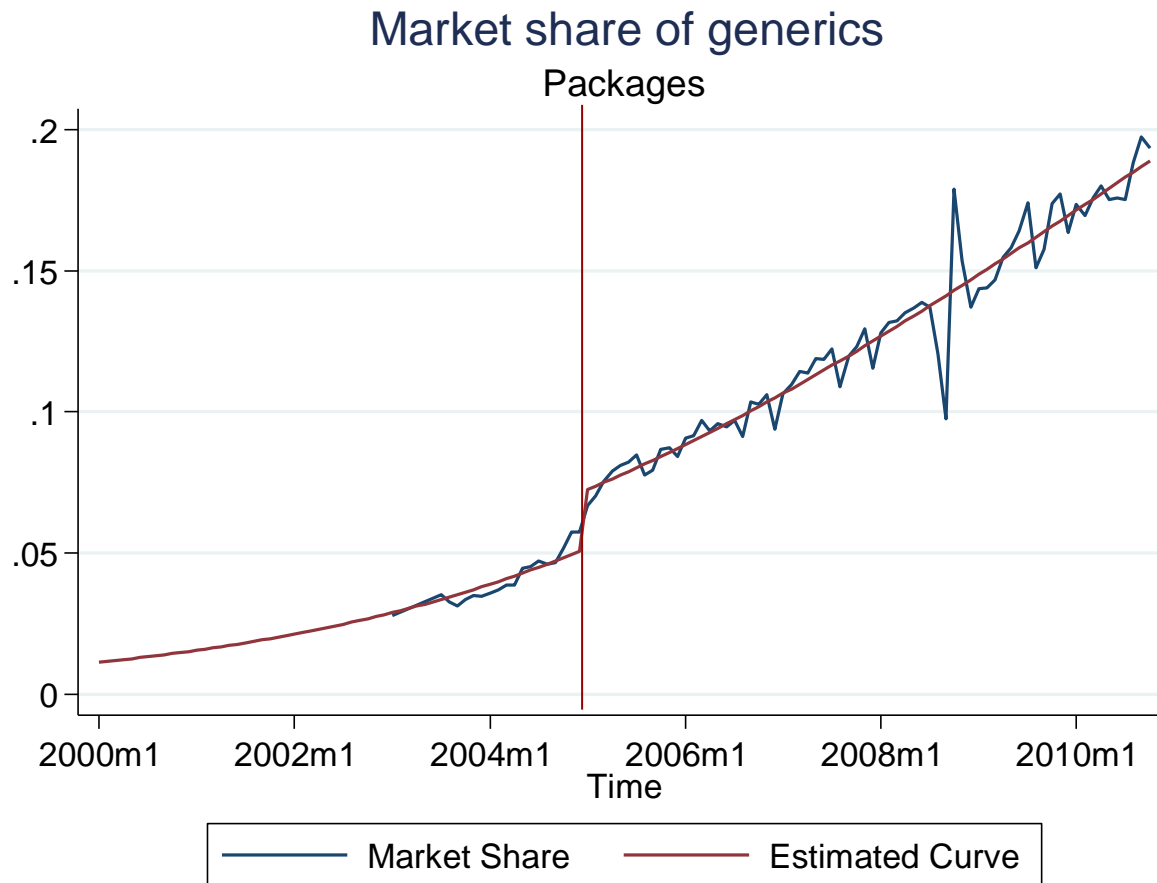
- Market still growing;
- Maximum value: 36% (highly uncertain).

Results – Market share of packages

- What had an effect?

  - Only three measures taken at the same time (Jan 2005): not possible to know exactly which one actually had an impact:

  - (i) Redefinition of pharmaceutical groups according to a new classification (does not change coverage regime);

  - (ii) New rules for the dimension of packages of pharmaceuticals under NHS coverage – **Most likely cause**;

  - (iii) Reference pricing system for NHS coverage on ADMG and SAD.

- What did not work?

  - Basically everything;

  - But not that surprising!

Conclusions

- For the time frame between January 2000 and October 2010;

- The market has followed its own dynamic;

- More than half of the policies adopted had no impact;

- Some had effect in the opposite direction;

- Impact more easily found in value rather than in quantity;

- Demand price elasticity lower than the unity;

- Lack of competition among generic producers.

Thank you!