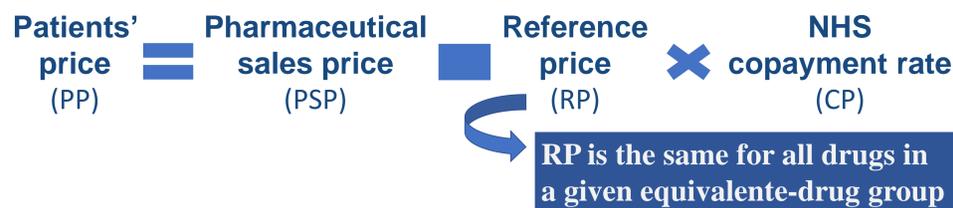# Pharmaceutical pricing dynamics in a reference price system

Eduardo Costa, Carolina Santos
Nova School of Business and Economics
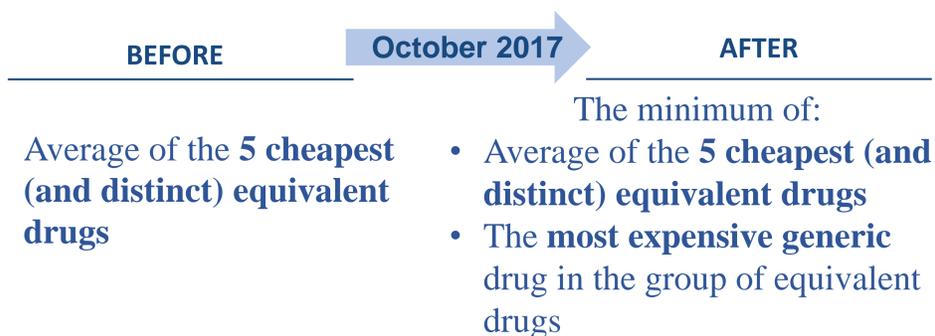
Introduction

- Reference price (RP) regimes aim at:
  - o curbing public expenditure with pharmaceuticals;
  - o induce drug substitution from branded to generic drugs and
  - o enhance competition between pharmaceutical firms.
- Drugs in a RP system are clustered in equivalente-drug groups, according to their active substance and formulation.
- Patients copay the difference between the drug price and the reimbursement level:

Patients' price (PP) = **Pharmaceutical sales price (PSP)** − **Reference price (RP)** ✕ **NHS copayment rate (CP)**

> RP is the same for all drugs in a given equivalente-drug group

Objectives

- In October 2017, a policy change reduced the RP for 36% of the equivalente-drug groups. All else constant, a lower RP would imply a lower reimbursement by the NHS and an increase in the price paid patients.

BEFORE → **October 2017** → **AFTER**

BEFORE:
Average of the **5 cheapest (and distinct) equivalent drugs**

AFTER:
The minimum of:
- Average of the **5 cheapest (and distinct) equivalent drugs**
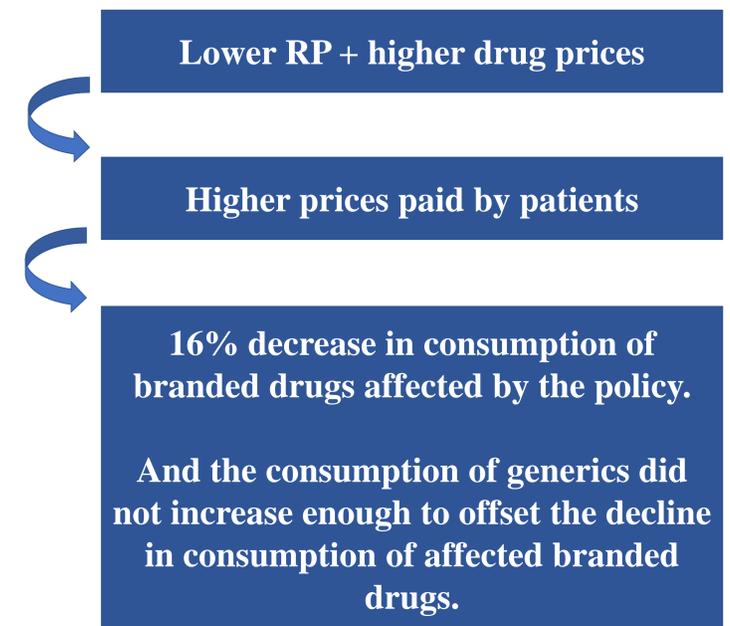- The **most expensive generic** drug in the group of equivalent drugs

- This change in the price paid by the patient could trigger a substitution between drugs and/or cause an overall decline in consumption of prescription drugs.
- A **difference-in-differences** analysis was used to study the firms' pricing decisions and consumers' reaction. Drugs are allocated to treatment and control groups depending on whether their RP was affected by the policy.

Results & Discussion
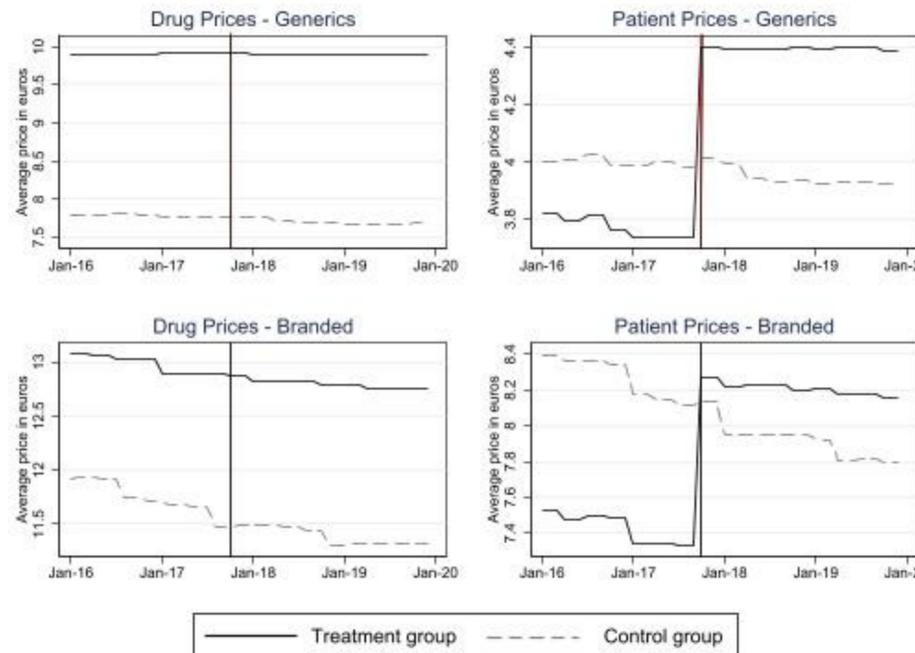
- After the policy change, the **RP for affected drugs became 14% lower than the RP without policy**. Thus, firms might have incentives to change prices in order to secure their market shares.
- However, both **branded and generic drugs affected by the policy increased their prices** relative to drugs not affected by the policy, and the increase was more pronounced for branded drugs.
- Note that this price increase for affected drugs is masked by the declining trend on average prices.
- The price increase for affected branded drugs goes against theoretical predictions. This might be due to the fact that:
  - o Equivalent-drug groups affected by the policy usually correspond to active susbstances that lost patent recently and still face few generic competition;
  - o In those groups, consumers may be more brand-loyal.

For the affected drugs:

> **Lower RP + higher drug prices**
>
> ↳ **Higher prices paid by patients**
>
> ↳ **16% decrease in consumption of branded drugs affected by the policy.**
>
> **And the consumption of generics did not increase enough to offset the decline in consumption of affected branded drugs.**

Conclusion

- Contrary to theoretical predictions, the reference price decrease implied a price increase in branded drugs affected by the policy. It also translated into price increases for affected generic drugs.
- Hence, prices paid by patients increased and consumption changed heterogeneously across regions and therapeutics.
- NHS savings with copayments were achieved through higher out-of-pocket payments made by the patients, raising equity concerns.

Eduardo Costa
costa.eduardo@novasbe.pt
Carolina Santos
carolina.santos.2012@novasbe.pt