



The Public Defense
of the Doctoral Thesis in Economics

by

Gábor Koltay

on

FROM STRUCTURAL ESTIMATION TO QUASI EXPERIMENT
THREE ESSAYS IN EMPIRICAL INDUSTRIAL ORGANIZATION

will be held on

Monday, February 20, 2012 at 2:30 pm

in the

Monument Building, Senate room of CEU

CentralEuropeanUniversity

Nádor utca 9, Budapest

Thesis Committee:

László Csaba (Chair)

Miklós Koren (Internal examiner)

Andrzej Baniak (Internal member)

Gábor Békés (External member)

Ádám Szentpéteri (External member)

The doctoral thesis is available for inspection
at the CEU Economics Department

Abstract

The thesis consists of three empirical studies in the field of empirical industrial organization and uses econometric tools to analyze the behavior of consumers and firms. Chapter 1 looks at the demand for eco-labeled products, with the aim of describing consumer behavior in these situations and estimating the willingness to pay for the German eco-label *Blauer Engel*. In contrast to this demand side study the following two chapters focus on the supply side and analyze firms' pricing decisions. Chapter 2 investigates whether gasoline stations raise prices faster in increasing wholesale price periods compared to the reductions in decreasing wholesale price periods. This chapter looks at how asymmetric pricing behavior varies with station characteristics in order to differentiate among various existing explanations for asymmetries. Finally, Chapter 3 analyzes two, nearly simultaneous mergers and their effect on prices. The objective here is to differentiate among the different type of price effects predicted by economic theory.

Chapter 1 How much does your environment matter? Estimating the effect of the *Blauer Engel* eco-label

Chapter 1 examines how consumers choose eco-labeled products. It argues that eco-labels transform ordinary products into impure public goods that offer the consumer the possibility to contribute to reduced environmental pollution next to the usual product characteristics. Accordingly, when estimating the effect of an eco-label the consumer choice model has to incorporate various explanations for the private provision of public goods: pure altruism, warm glow and conditional cooperation.

The contribution of the first chapter is threefold. First, it shows that eco-labels imply a specific demand structure. I show in an impure public good modelling framework that accounting for all relevant behavioral motivations of consumers implies a demand system where the individual is influenced by the average expected choices of the others.

Second, the chapter suggests ways to identify such interdependent preferences. I show that standard restrictions in discrete choice demand models are sufficient to solve this endogeneity. Moreover, I use geographic heterogeneity to separate the endogenous demand effect from the eco-labeling decisions made by firms.

Finally, the chapter provides estimates of the willingness to pay for the *Blauer Engel* eco-label using a unique dataset based on German consumer-level panel data provided by GfK Germany and information about the German eco-label *Blauer Engel* made available by RAL, the German eco-labeling agency. The estimates show that expectations about fellow consumers' behavior matter: in low purchase

environments consumers are willing to pay 30% less, while in high purchase environments they are willing to pay 30% more for eco-labeled products. The effect of the Blauer Engel label is close to zero on average, nevertheless. The results suggest that the success of such "self-regulation" is heavily dependent on the norms and beliefs of market participants.

Chapter 2 Not an average story: Asymmetric price transmission in the Hungarian gasoline retail market

Chapter 2 studies how station-level retail prices respond to wholesale price changes in the Hungarian gasoline market. It exploits a unique station-level panel dataset in order to differentiate between existing explanations of asymmetric pricing. The chapter demonstrates that average pricing behavior might mask important heterogeneities and that pricing decisions should be analyzed at the firm level where these decisions are made.

The estimates show that although retail price changes are almost symmetric on average, there is a subset of stations that follow an asymmetric pricing strategy. Having a closer look at station characteristics reveals that asymmetric pricing is a brand property and that these brands have small market share (below 10%) and are not vertically integrated. Other observables, like the number of competitors or types of competitors do not explain asymmetric retail price response.

These results imply that in the same local market some firms price symmetrically while others price asymmetrically. This finding does not support collusion and search based explanations that depend on market level interactions among firms and consumers. Instead it points towards the role of adjustment costs as an explanation for asymmetric retail price response. Moreover, the result that the number of competitors and type of competitors does not explain asymmetric retail price responses lends additional support to the claim that pricing asymmetry does not necessarily imply collusive behavior.

Chapter 3 Separating the ex post effects of mergers: an analysis of structural changes on the Hungarian retail gasoline market (joint with GergelyCsorba and DávidFarkas)

Chapter 3 shows how the difference-in-differences method can be used to separate heterogeneous merger effects. Different effects are separately estimated for two simultaneous mergers, for buyer and seller firms in the respective mergers and also for the competitors of the merging firms. Separating merger effects enables one to test some important predictions of academic and antitrust literature, which argue that a merger can result in different price changes for different firms, depending on their role in the merger. First, the most robust prediction is that a merger will result in a larger change in merging firms' pricing than in competitor firms' pricing as the former can fully internalize the effect of eliminating the competitive constraint (externality) the two firms had on each other before the merger. Second, in mergers

with local markets, a larger price increase is expected on markets where both merging firms are present (or are closer competitors to each other), since the merger removes a direct competitive constraint between their respective outlets. Third, a merger might have a different effect on the two firms involved, as the business policies and supply conditions of the firms will likely converge towards each other, and the change is usually conjectured to be larger for the case of the acquired firm than for the buyer firm.

The base result is that neither merger contributed substantially to retail price increases, as all estimated price changes are less than one percent. Moreover, the two mergers had different effects on the merging firms depending on their role in the merger. These differences are broadly in line with the theoretical predictions. For the Agip/Esso merger, there are significant effects on the pricing of the acquired Esso stations and their competitors, and the price change is larger at Esso stations than at competitors' stations (although the difference is not significant). For the Lukoil/Jet merger, own effects are larger than competitor effects, but a significant effect is found only for the buying firm's stations.

Chapter 3 also discusses in detail the validity of difference-in-differences methods for merger effect estimation. An increasing number of studies (for example Hastings, 2004) began to use this estimation type for estimating merger effects, but they usually do not discuss whether the assumptions of this method are satisfied or not. Mergers are not standard quasi experiments for the following reasons. First, most likely the merger decisions are endogenous: the merger decision is not independent from retail prices. Second, in most mergers only the clearance date is known but not the date of the actual behavioral change. Therefore the definition of the before and after depends on the judgment of the researcher. Results can be sensitive to this judgment if the time series is not long enough. Third, the merger affects also competitors of the merging parties, through the price equilibrium. These market interaction effects become problematic if there are more mergers taking place in the market: without further assumptions the difference-in-differences estimator is not valid. The chapter addresses each of these problems and shows the sensitivity of the results to these problems.

CURRICULUM VITAE

GÁBOR KOLTAY

Department of Economics, Central European University
11 Nádor u. 9
Budapest 1051, Hungary
Phone: +36 1 327 3000
Cell: +36 20 3363163
cphkog01@phd.ceu.hu

European Commission - DG ECFIN
Avenue de Beaulieu 1
Brussels, Belgium
Phone: +32 22985016
gabor.koltay@ec.europa.eu

(January 2012)

WORK EXPERIENCE

- 2009- *Economic Analyst*, European Commission, DG Economic and Financial Affairs
- 2006-2008 *Junior researcher*, Institute of Economics, Hungarian Academy of Sciences

EDUCATION

- 2004-2011 *Ph.D.*, Economics, Central European University (Budapest, Hungary) www.economics.ceu.hu
Field: Empirical industrial organization
Dissertation: From structural estimation to quasi experiment – Three essays on empirical industrial organization
- 2002-2004 *M.A.*, Economics, Central European University, (Budapest, Hungary), www.economics.ceu.hu
Thesis: Policy Alternatives under Environmental Quality Competition
- 1996-2002 *M.A.*, Economics, Corvinus University of Budapest (Budapest, Hungary), www.uni-corvinus.hu
Thesis: Capital markets and economic development in transition economies

TEACHING EXPERIENCE

2008	<i>Lecturer</i> , Econometrics, RajkLászló College, Corvinus University, Budapest
2006	<i>Lecturer</i> , Basic Microeconomics, Corvinus University, Budapest
2006	<i>Teaching Assistant</i> , Statistics, Central European University
2005	<i>Teaching Assistant</i> , Econometrics 1, Central European University
2003	<i>Lecturer</i> , Topics in Economic Methodology, College for Social Theory, Corvinus University, Budapest
2002-2003	<i>Lecturer</i> , Ethics and Economics, College for Social Theory, Corvinus University, Budapest

SKILLS AND QUALIFICATIONS

Microsoft Office, Eviews, Stata, Gauss
Fluent in English, fair in German, beginner in French

PRESENTATIONS

2010	Annual Conference of the Hungarian Society of Economics, Budapest
2009	Annual Conference of the European Association for Research in Industrial Economics (EARIE), Ljubljana
2008	CERGE-EI, GDN RRC VIII Conference, 10-11 August 2008, Prague
2004	CORE, Industrial Economics and the Environment Workshop, Louvain-la-Neuve, Belgium

PUBLICATIONS

Gergely Csorba, Gábor Koltay and Dávid Farkas.(2011)"Separating the ex post effects of mergers: an analysis of structural changes on the Hungarian retail gasoline market, "IE-HAS Discussion Papers 1118, Institute of Economics, Hungarian Academy of Sciences.