ZEW Economic Studies

Kai Hüschelrath

Vol. 41

# Competition Policy Analysis

## An Integrated Approach

ZEW
Zentrum für Europäische Wirtschaftsforschung GmbH

Physica-Verlag
A Springer Company

ZEW Economic Studies

Publication Series of the Centre for European Economic Research (ZEW), Mannheim, Germany

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**Series Editor**
Prof. Dr. Dr. h.c. mult. Wolfang Franz

**Author**
Dr. Kai Hüschelrath
Centre for European Economic Research (ZEW)
L7, 1
68161 Mannheim
Germany
hueschelrath@zew.de

Zugl.: Vallendar, Diss., Wissenschaftliche Hochschule für Unternehmensführung (WHU) -Otto-Beisheim-Hochschule-, 2007

ISBN 978-3-7908-2089-8 e-ISBN 978-3-7908-2090-4

DOI: 10.1007/978-3-7908-2090-4

Library of Congress Control Number: 2008934653



*Cover design:* WMXDesign GmbH, Heidelberg

Printed on acid-free paper

9 8 7 6 5 4 3 2 1

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*I shall be telling this with a sigh.*
*Somewhere ages and ages hence:*
*Two roads diverged in a wood, and I –*
*I took the one less traveled by,*
*And that has made all the difference.*

Robert Frost (1874-1963)
*The Road Not Taken*

# Foreword

Competition policy is an integral and prominent part of economic policy-making in the European Union. The EU Treaty prescribes its member states to conduct economic policy 'in accordance with the principle of an open market economy with free competition'. More precisely, the goal of EU competition policy is "to defend and develop effective competition in the common market" (European Commission, 2000: 7). Under its Commissioners van Miert, Monti and, most recently, Kroes the EU Commission has stepped up its effort to pursue and achieve the aforementioned goal. A number of so-called hard-core cartels, such as the notorious "vitamin cartel" led by Roche, have been detected, tried in violation of Art. 81 of the Maastricht Accord and punished with severe fines. Also Microsoft was hit hard by the strong hand of the Commission having been severely fined for exploiting a dominant market position.

Economic analysis has been playing an increasingly significant role in the Commission's examination of competition law cases. This holds true in particular for merger control. Here, however, the Commission has had to accept some poignant defeats in court, such as the Court's reversals of Airtours-First Choice or GE-Honeywell. Among other things, the European Court of Justice found the economic analysis as conducted by the EU's Directorate General for Competition to be flawed and the conclusions drawn not to be convincing. These rejections by the courts have stirred up the scholarly debate on the conceptual foundations of European competition policy.

Against this background Kai Hüschelrath applies theoretical reasoning to conceptualize an economic analysis that may better serve the needs of competition policy. Hüschelrath claims that, in order to be coherent and consistent, competition policy needs "the design of a progression of compulsory analytical steps to effectively constrain the strategies available to firms aiming at maximising the total welfare contribution for a given enforcement budget". Therefore, in Chapter 2 he develops a three-layered integrated approach to competition analysis. As the first and fundamental layer, policymakers should clearly define the purpose, goals and instruments of competition policy by applying microeconomic reasoning. On the second layer, the strategic behaviour of firms should be carefully analysed using theoretical and empirical tools to evaluate potential welfare effects and effects of alternative measures of policy intervention. The third layer refers to the critical operational tasks, such as the delineation of the relevant market, both in principle and case-based, or the measurement of market power.

In applying his approach Hüschelrath focuses on the strategic behaviour of oligopolistic firms. Using game theory, Chapter 3 discusses the welfare effects of strategically acting incumbents when faced with potential entrants. The theoretical and simulation results show that the overall welfare effects of strategic firm behaviour are in fact indeterminate under most circumstances, in particular if the entrant is not facing an incumbent monopolist but an oligopoly market. To avoid negative welfare effects of strategic firm behaviour, Hüschelrath therefore suggests that competition policy pursue a rule-of-reason approach to rein in strategic firm behaviour rather than a per-se rule.

Predation is a type of an incumbent's strategic behaviour that has been extensively and controversially discussed in the literature. In Chapter 4 Hüschelrath provides a very balanced and highly stimulating review of the existing literature and concludes that predatory behaviour can indeed be rational and profitable, Selten's chain-store paradox notwithstanding. Hüschelrath continues with a theoretical analysis revealing that the welfare effects of predatory behaviour are highly likely to be exclusively negative. Competition policy should thus take a tough stance and intervene accordingly and appropriately. Based on his theoretical and simulation assessment of potential countermeasures, Hüschelrath suggests a predation enforcement framework which promises to be valuable for practical application.

In the concluding chapter Hüschelrath critically reflects on his findings and provides the reader with an outlook on the shape of things to come.

Summing up, this book not only provides a state-of-art discussion of contemporary competition policy analysis but offers a host of new insights – some may be controversial, pending real-life testing, but they are definitely challenging discussion. Competition Policy Analysis is an invaluable read for everybody interested in the theory and practice of competition policy.

Vallendar, April 2008

*Jürgen Weigand*
*Professor of Economics*
*Otto Beisheim School of Management*

# Preface

In a recent working paper, Gregory Mankiw (2006) divided the family of macroeconomists into two classes: *Scientists* and *Engineers.* While the scientist tries to understand how the world works, the engineer tries to solve practical problems. According to Mankiw, the class of scientists currently has a substantially larger population than the class of engineers. As a consequence, when it comes to providing practical policy advice, this asymmetry might create substantial problems and intensifies the desire for a class of *Scienteers,* which internalises both views and is therefore able to give applicable scientific-based policy advice.

Applying Mankiw's taxonomy to microeconomics, this book follows a Scienteer approach by developing an integrated approach of competition policy analysis. Based on the assumption that the deterrence of anticompetitive behaviour is the fundamental aim of competition policy rules and their enforcement, three pivotal levels of such an integrated approach are identified: a fundamental level, a strategic level and an operational level. After developing the approach, it is then applied to three traditional areas of competition policy – hard core cartels, horizontal mergers and predation – to draw conclusions on how to ameliorate current competition policy. The innovative idea of the book is its coverage of the entire process of designing and implementing competition rules. Past research has largely concentrated on particular aspects of the integrated approach (such as investigations of welfare effects or the development of detection strategies), but these were at the expense of practicability issues. The book proposes ways in which this divergence can be narrowed.

The content of the book was accepted in September 2007 as a doctoral dissertation at the WHU Otto Beisheim School of Management in Vallendar, Germany. During the research and writing process I profited from the support of many people and would like to take this opportunity to acknowledge them. Among all contributors, my supervisor and mentor, Professor Dr. Jürgen Weigand, was certainly the most important. Apart from the very productive working environment at his Institute for Industrial Organization and countless discussions on various aspects of competition policy, the most formative influence was his continuous encouragement to participate in the activities the academic community has to offer. I am exceptionally grateful for these important experiences.

I am also deeply indebted to Professor Dr. Michael Frenkel, not only for his role as second supervisor of the thesis, but also for easing my integration into the WHU in those early days. The thesis definitely profited from the very productive research environment at WHU, and I would like to thank especially my colleagues Regine Braun, Dr. Alexandra Groß-Schuler, Ansgar Kirchheim, Claus Neuser,

Christian Steiner, Irene Delzer, Professor Dr. Ralf Fendel, Professor Dr. Wolf-Heimo Grieben, Dr. Günter Schmidt and Christoph Swonke for their contribution to this environment. Special thanks go to PD Dr. Georg Stadtmann not only for more than two years of companionship at the Institute for Industrial Organization but especially for creating constant pressure to take that last step and finally submit the thesis. Elisabeth Pirsch was always very helpful in guiding me through the administrative jungle.

A significant part of the study was written at the Centre for European Economic Research (ZEW), which I joined in October 2006. I am especially thankful to Professor Dr. Dr. h.c. mult. Wolfgang Franz not only for his agreement to publish the thesis in his series 'ZEW Economic Studies' but especially for creating and maintaining an unparalleled research environment at the ZEW. Furthermore, I am exceptionally thankful to Dr. Georg Licht for his support thoughout the important final months of the project. Special thanks go to Dr. Patrick Beschorner for very valuable comments on a draft version of the thesis and to my colleagues in the competition policy team at ZEW consisting of Martina Lauk, Dr. Nina Leheyda, Hannes Ullrich and Tobias Veith for their support. I am very grateful to Janine Micunek Fuchs for editing the manuscript. Romy Weiland was especially helpful in managing the publication process.

Furthermore, the project profited from a number of research stays, and I would like to thank Professor Dr. Alari Purju (Tallinn University of Technology), Lea Tonston (Estonian Competition Board), Professor Peter Møllgaard PhD (Copenhagen Business School), Professor Margaret Slade PhD (University of Warwick), and Adrian Raass (Swiss Competition Commission) for their hospitality and support. I am especially indebted to Professor Daniel Rubinfeld PhD (University of California at Berkeley) and Professor Thomas W. Ross PhD (University of British Columbia), not only for making exceptional research stays at two of the leading universities in North America possible but also for providing the opportunity to attend a couple of high-level graduate courses. Professor Norbert Schulz PhD from the University of Würzburg provided me with the necessary tools to undertake research in the area of competition policy and guided me in taking some first steps into the academic community. Special thanks go to Dr. Christian Köberlein, Professor Jürgen Müller PhD and Professor Dr. Hans-Martin Niemeier for their companionship and guidance throughout my academic development.

Last but certainly not least, I would like to thank my family for their continuous and overwhelming support. My girlfriend Diana was always supportive and motivating throughout the project and exceptionally generous in sacrificing countless weekends and holidays. Of all the support I received from my parents, my grandparents and my brother, probably the most valuable was the advice to concentrate on the important things in life and to follow each goal with maximum dedication.

Mannheim, August 2008 *Kai Hüschelrath*

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# 1 Introduction

> *There was a man of Sicily, who, having money deposited with him, bought up the iron from the iron mines; afterwards, when the merchants from their various markets came to buy, he was the only seller, and without much increasing the price he gained 200 per cent. Which when Dionysius heard, he told him that he might take away his money, but that he must not remain at Syracuse, for he thought that the man had discovered a way of making money which was injurious to his own interests.*
>
> Aristotle, Politica (347 BC), Part XI

## 1.1 Motivation and Objectives

The striving for a monopoly position is probably as old as civilised mankind. Like the man of Sicily, people at all times have tried to restrict competition and enjoy the best of all monopoly profits: A quiet life! (Hicks, 1935). And indeed, it is easy to imagine that the alternative to an iron monopoly – some form of competition between different iron mines and iron distributors – would not have been a quarter as nice for the man of Sicily. Challenged by vertically integrated iron mines as well as rival distributors with probably more efficient production possibilities, better quality products or more innovative ideas to market the products, he would have had to work hard in order to prevail and to make a living.

Although the personal situation of the man of Sicily would have been worse under competition, the people of Syracuse as a whole likely would have benefited from competing iron mines and iron distributors by paying lower prices for iron and iron products and by gaining the possibility to buy better quality and more innovative products. It is unclear whether Dionysius implicitly had these effects in mind when he ruled that the man of Sicily had to leave the country because of his (successful) attempt to monopolise the iron market in Syracuse.

Nothing substantial has changed during the almost 2400 years since the man of Sicily had to leave Syracuse. Nowadays, the (potential) men of Sicily are called Microsoft or E.ON; the role of Dionysius is taken over by the Antitrust Division of the US Department of Justice or the Bundeskartellamt; and the potential interventions reach from simple orders to terminate infringements, over significant fines, up to behavioural or even structural remedies. Admittedly, attempts to re-

strict competition nowadays are typically much more sophisticated and take place in much more complex environments; however, the basic motivation behind them remains the same: the striving for a monopoly position.

What certainly has changed over the last 230 years or so is the economic understanding and evaluation of competitive interactions (and the problems triggered by their absence). In today's terminology, the man of Sicily exercised market power because he was able to profitably raise (and maintain) a price above his marginal costs. As a consequence, his behaviour likely generated a Pareto inefficiency. The follow-up question whether such welfare-reducing firm behaviour nowadays should trigger some kind of state intervention is disputed among economists. While one group of economists probably would not see any reason to restrict economic freedom by some form of state intervention, another group would probably prefer to end a possible abuse of a dominant position by some kind of antitrust intervention[1] (such as imposing a behavioural remedy), with the aim of creating or restoring competition in the market for iron. A third group of economists might instead argue that permanent oversight and regulation of the activities of the man of Sicily would be the appropriate reaction to restrict his economic power. Such a claim could be based on the presumption that competition in the market for iron is either not workable or not socially desirable given the prevalent market demand and firm cost structure.

Generally speaking, an economically well-founded decision on the desirability of state interventions – and the choice of the appropriate policy option – eventually has to be based on the fundamental objectives of economic policy. From a normative perspective, the ultimate aim of economic policy is the promotion of the wealth of nations – as first described in detail in the seminal contribution of Adam Smith (1776). Although it is, from a theoretical perspective, not immediately clear that state interventions have this potential to promote the wealth of nations[2], the standard answer to the follow-up question of how this overarching aim can be reached typically includes *promoting economic efficiency* as one cornerstone in a collection of important intermediate aims of economic policy. Given this aim, extensive theoretical and empirical economic research has been able to prove a positive, strong and stable relationship between the degree of competition[3]

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1 The terms *antitrust intervention* and *competition policy intervention* and the terms *antitrust policy* and *competition policy* are used interchangeably. This especially means that speaking about antitrust policy does not intend to create an automatical reference to the competition policy of the United States (where the term *antitrust policy* originated).

2 The question whether state interventions can generally have the potential to increase welfare is assessed, among many others, by Coase (1960). He finds that only the existence of positive transaction costs creates room for welfare-improving state interventions.

3 It is not attempted in the main text to define competition but rather to concentrate on the description of its characteristics. However, von Weizsäcker (1995: 2730, translated by the author) provides a very general definition of competition: "Competition is a process of the choice of objects among alternatives with respect to the suitability

in a market, an industry or an economy and the correspondingly realised degrees of efficiency. As a consequence, promoting competition typically serves the overarching aim of promoting efficiency as well.[4]

Although the identified link between competition and efficiency is prevalent in most markets and industries, economic research has also identified circumstances in which competition either does not function at all or can be expected to realise suboptimal economic results. In such circumstances of so-called market failures or market imperfections, regulatory interventions or even some kind of permanent regulatory supervision may be a warrantable option to promote the overarching aim of economic efficiency. To put it differently, while there is no significant doubt that the most desirable way to reach and maintain a high level of economic efficiency is by promoting competition, regulatory interventions might be a second-best option to promote this overarching aim in case the first-best option is not available at all or can be expected to realise poor results.[5]

In addition to situations in which some form of regulatory intervention is necessary, the competition-efficiency link might also be endangered in essentially competitive industries by forms of anticompetitive firm behaviour which aim at restricting competition to the detriment of consumers and without realising significant positive effects for society as a whole. These threats to the institution of competition mark the basic rationale for introducing competition policy norms (and their respective enforcement) in market economies.[6] In the words of Geroski

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of the chosen object for the respective environment". See Kolaski (2004) for more practical answers to the question What is competition? and especially for differences in interpretation between the United States and Europe.

4 In other words, competition is not an end in itself, but "rather it is to be encouraged as a means to improving economic efficiency" (Hay, 1993: 2). However, it should be noted here that such an understanding of competition is based on so-called mainstream industrial organisation. As Hay explains in detail, specific economic schools of thought, such as the Neo-Austrian school, argue that competition in and of itself is the appropriate objective. Consequently, the process of competition and not the outcome of competition should be the motivation for public policy actions. See World Bank (1999: 1ff.) for a general overview of the objectives of competition policy and especially a discussion on possible conflicts among multiple objectives.

5 Furthermore, it is important to note that the provision of an appropriate form of regulation in industries with monopoly elements (such as a railway network) is pivotal to create and maintain competition in markets in which this is socially desirable (such as rail transportation services).

6 Following a recent survey article by Evenett (2005b: 7ff.), the historically dominant objectives for the introduction of competition policy norms were the protection of economic freedom as well as fairness considerations. Although many actual competition laws are still inspired and influenced by these motivations, the contemporary view is more that "the protection of competition and efficiency" (Posner, 1976) should be seen as the fundamental aim of competition policy. However, there is no doubt that real competition law provisions typically follow multiple aims with different weightings (and potential conflicts of aims). Mehta and Evenett (2005), for example, differ between objectives officially stated in the national competition law provi-

(2004: 4), unlike regulation, which typically establishes a continuous relationship to industries with structural competition problems, competition policy only "swings into operation when serious, egregious problems are believed to exist" in essentially competitive industries.

In an attempt to further characterise the relationship between competition policy and regulation, Rey (2002) identifies four important criteria which help to distinguish these policy options. The first criterion, *procedures and control rights,* refers to the fact that regulatory authorities typically have more power to actively constrain the behaviour of the respective firms in an industry (such as by regulating price, entry or investment) than antitrust authorities, who basically enforce the existing competition law provisions. The second criterion, *timing of oversight,* refers to the observation that antitrust policy typically takes place ex post – after a certain anticompetitive behaviour has occurred and been detected – while regulation typically involves ex ante interventions. The third criterion, *information intensiveness and continued relationship,* refers to the fact that a regulatory authority typically develops a profound knowledge of the regulated industry given the continuous and long-term nature of regulation; whereas an antitrust authority typically does not develop such a continued relationship with certain industries but rather only acquires the necessary knowledge of the industry in the event of a particular case. The fourth separation criterion, *relationship to political power,* refers to the general influence of politics (and interest groups) on the respective agencies. Generally, antitrust authorities tend to be more independent in their decisions than regulatory authorities. [7]

Although these categories are all important for characterising the relationship between competition policy and regulation, Joskow (2002: 98) argues that the truly essential difference between them is that "antitrust policy is primarily a deterrence system not a regulatory system".[8] In other words, while regulation satis-

sions and more practical reasons given especially by countries in the Asia-Pacific region which recently introduced competition law. The official reasons for introducing such provisions include economic efficiency, consumer welfare, fair trading and the prevention of excessive concentrations; the more practical reasons include concentration concerns, curbing state monopolies, improving other government policies, conditionality from major development institutions, commitments made under free trade agreements and the realisation that it is basically "good public policy" (see Mehta and Evenett, 2005: xxiii).

7 Although there is no doubt that Rey's classification covers important aspects of the distinction between competition and regulation, there is also no doubt that his classification is not perfectly selective. Merger control, for example, is a traditional antitrust activity which largely takes place ex ante. Furthermore, competition authorities can also try to build a constant relationship with the respective industries by simply choosing a suitable organisational structure of the authority (based on industries).

8 It should be noted here that Joskow's (2002) quote refers to US antitrust policy. However, there is no doubt that also other legislations (such as that of the European Union) have implemented a deterrence-based system and not a regulatory system. With respect to cartel enforcement, Neelie Kroes, the current European commissioner responsible for competition policy, said recently that generally "[p]revention is better

fies the need for continuous supervision and intervention in industries with structural competition problems, antitrust policy should aim at creating a deterrence effect by combining "the prospect of being subject to reasonable (and unpleasant) penalties and the serious likelihood of being caught while engaged in the illegal activity" (Baker, 2003: 713). The creation and maintenance of such a deterrence effect, however, depends fundamentally on the design *and* implementation of appropriate antitrust rules (which concretise the kind of activities that are deemed illegal) – and antitrust institutions, which have the power to achieve compliance with these rules.

It is pivotal for antitrust policy to develop a set of clear and understandable antitrust rules, because "firms must be able to operate within a set of rules for competition that enable them to identify what strategies are likely to attract scrutiny, and what strategies they can pursue without hindrance" (Hay, 1993: 12). In other words, the design of antitrust rules needs to consider the trade-off between economic exactness on the one hand and providing clear signals to firms about what is allowed and what is not allowed on the other hand. In the words of Carlton (2003a: 2),

> [e]conomics can make sure that antitrust is grounded in logical analysis, but antitrust policy can use economic concepts and insights only if they are practical and capable of being implemented. This demand for practicality provides a discipline on economics that forces it to be relevant.

Notwithstanding the importance of an appropriate design of antitrust rules for antitrust policy, it is equally critical to understand that even the cleverest set of rules remains an academic mind game if it is not implemented and enforced by the responsible institutions. In addition to the mere existence of a public institution "that is empowered to seek out and to evaluate possible failures of competition (including powers to collect evidence)" (Hay, 1993: 14), antitrust enforcement essentially means to send clear signals to firms that breaches of antitrust rules are likely to cause antitrust interventions. These essential additional preconditions for achieving a deterrence effect are expressed very clearly by Everett (2005b: 10):

> Firms being rational decision makers will trade off the benefits of engaging in anticompetitive acts against the likelihood of enforcement action and any resulting punishments, be they fines or otherwise. The deterrent effect, therefore, of a competition law depends on firms' perception of the effectiveness of the implementation of competition law. Enactment of such laws is not enough; what matters is judicious and efficient implementation.[9]

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than cure … [however] sometimes a substantial fine is quite a direct way to really drive our deterrent message home!" (Kroes, 2006: 2).

[9] As confirmed by Rey (2002: 2), "little work has been done to account for implementation issues in the area of antitrust policy … no one asks the question: is this policy implication useful for competition agencies?" Following OECD (2007: 7), "[h]ow to craft appropriate and effective remedies and sanctions is a subject that is just as important as how to define dominance or identify abusive conduct, but it has received substantially less attention".

Based on these essential categories of a deterrence-based antitrust policy, it is the aim of the following chapters to contribute to the design and implementation of an *efficient* antitrust policy. An efficient antitrust policy consists of a set of effectively enforced rules that constrain the firms' competitive strategies aiming at maximising the total welfare contribution for a given enforcement budget. In order to reach this aim, an integrated approach of antitrust analysis is developed (and subsequently applied), which separates the antitrust policy process into three subsequent stages: a fundamental level, a strategic level and an operational level. The basic structure of this approach and the subsequent business conduct applications are sketched in the following section.

## 1.2 Structure

The present work is organised into six chapters. The first chapter introduces the motivations and objectives of the work and outlines the structure of the following chapters. The second chapter develops an integrated approach of antitrust analysis. The approach involves three different levels, as shown in Figure 1.

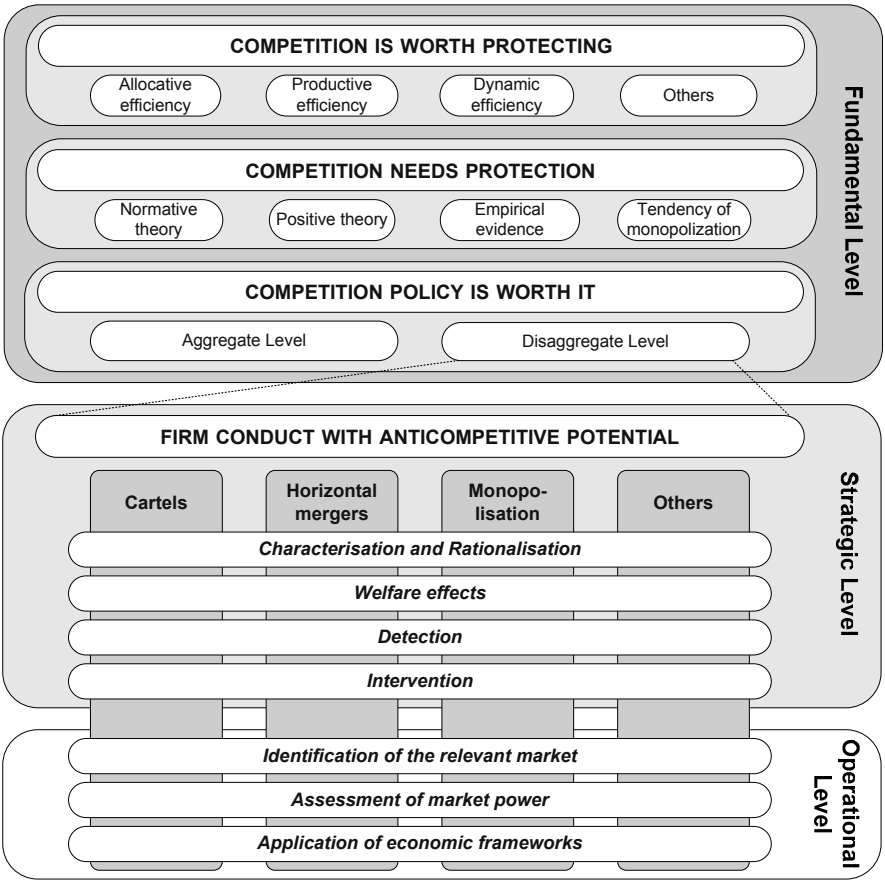
The *fundamental level* aims at answering existential questions of competition and competition policy. In particular, it assesses whether competition is worth protecting, whether competition needs protection and whether competition policy is bringing more benefits than costs to society. Such an assessment of the costs and benefits of antitrust enforcement for selected countries (on an aggregate and disaggregate level) is possible and sensible, because most countries have already implemented some kind of competition law. The consequential question is thus not whether it is welfare-increasing to introduce competition policy but rather whether (and how) it is possible to ameliorate it.

The *strategic level* aims at developing a progression of necessary steps to assess whether and how certain business conducts should be subject to antitrust policy. In addition to an initial delineation and characterisation of the business conduct, a welfare assessment and a concept of detection and intervention needs to be developed to ensure an integrated approach of antitrust analysis, which in turn ensures the creation of the desired deterrence effect. It is important to note that the strategic level aims at developing necessary analytical steps entirely from the viewpoint of (applied) microeconomics and antitrust economics. Existing law provisions are only referred to by way of example to underpin the theoretical arguments.

Whereas the strategic level aims at constructing investigation frameworks from a largely normative economic perspective, the *operational level* focuses on the question of how an antitrust authority should implement these recommendations in a world confined by resource constraints and asymmetric information. Generally, resource constraints lead to the problem that the antitrust authority cannot investigate every case of possible anticompetitive behaviour but has to find routines to identify those cases which promise to maximise the welfare contribution of antitrust policy for a given enforcement budget. The standard elements of such a rou-

tine are the delineation of the relevant market and the assessment of market power (consisting of concentration analysis and entry analysis). The second fundamental problem faced by an antitrust authority and therefore discussed on the operational level is asymmetric information. Asymmetric information generally leads to the danger of wrong and hence welfare-reducing case decisions by the antitrust authority and should therefore also be considered in the development of an efficient antitrust policy. Given the existence of resource constraints and asymmetric information, the insights derived on the strategic level need to be reassessed against this new background to guarantee an integrated approach of antitrust analysis. Consequently, the last stage on the operational level aims at providing recommendations for the design of practical frameworks for antitrust analysis. These theoretically derived proposals are in turn compared to the practical approaches currently followed by the antitrust policies of the European Union and the United States to identify improvement potential for current antitrust policy.

**Fig. 1.** The integrated approach



Based on the development of the integrated framework in the second chapter, the third chapter aims at applying parts of this framework to strategic behaviour. After generally characterising what is understood by strategic behaviour (from an economic perspective), the rationality of strategic behaviour is assessed in more detail. Subsequently, the welfare effects of strategic behaviour are investigated, essentially by comparing them to the competitive benchmark of Cournot competition. Based on the finding that strategic behaviour contains a multitude of different strategies with diverse welfare implications, three different antitrust enforcement options to cope with such conducts are discussed: a no-rule or do-nothing approach, a per-se-rule approach and a rule-of-reason approach. This section aims at providing a high-level discussion of these basic tools without making specific policy recommendations for strategic behaviour in general or certain forms of strategic behaviour in particular.

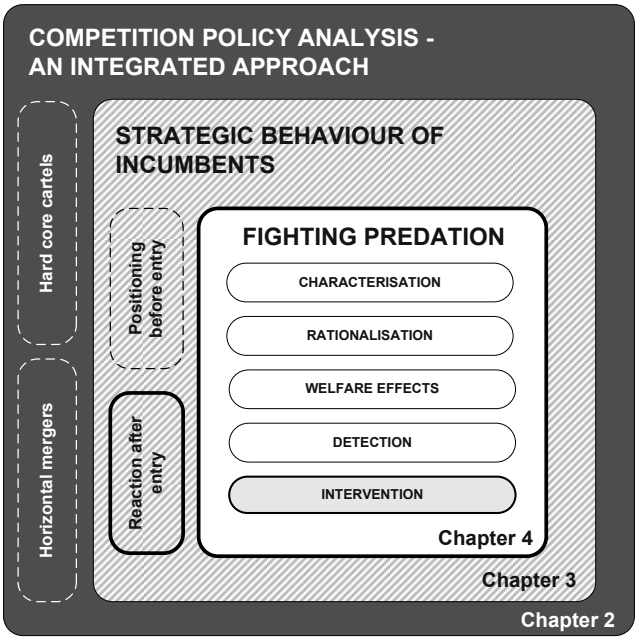
An in-depth antitrust analysis of one particular form of strategic behaviour – namely, predation – is the focus of the fourth chapter. After briefly reviewing research on an appropriate characterisation of predation and addressing the basic rationality behind predation strategies, the welfare effects of predation strategies are assessed. Based on the finding that predation strategies typically cause negative welfare effects, research on how to detect predation is reviewed next. The fourth chapter takes the analyses of the preceding levels for granted and analyses the complementary question of how predators should be fought. Although such an intervention phase is a compulsory part of the integrated approach for creating a deterrence effect, almost no sources have been devoted to finding appropriate answers to this question. After proving the practical relevance of the question with a discussion of recently decided predation cases in various jurisdictions, a Cournot oligopoly model is developed and applied to study the problem of predation enforcement. The model approach, which takes into account efficiency advantages of the entrant, allows analysing welfare effects of the various enforcement options mentioned above. Specific demand and cost functions which allow a quantification and easier interpretation of the (applied) results are then introduced, delivering further insights into optimal predation enforcement. The results of the formal approach are subsequently incorporated into the development of a predation enforcement framework which aims at increasing the deterrence effect for predation strategies; without, however, biasing the fundamentally important incentives for procompetitive price decreases.

The fifth chapter summarises the results of the preceding chapters and derives several general conclusions for implementing and maintaining an efficient antitrust policy. An overview of the research results with the strategic and operational levels is presented in an easy-to-read table. An annex chapter contains several smaller essays which feed into discussions in the main text. These essays include estimations of the welfare effects of a hard core cartel in the United States and a remedied merger in the Netherlands, an assessment of the antitrust implications of franchise agreements, a presentation of the specifics of so-called critical loss analyses in market definition and merger control and a description of the *Lufthansa-Germania* (2002) predation case. The annex further contains a section with

mathematical proofs, as well as a section which provides data tables for graphs presented in the main text.

Figure 2 depicts the general structure of the thesis. As shown, the second chapter not only aims at developing the integrated approach of antitrust analysis but also provides applications of the general framework to hard core cartel enforcement and to horizontal merger control. Such a procedure is important not only because it provides a test bed for the universal applicability of the developed framework, but also because it allows the derivation of specific proposals on ameliorating key activities of current antitrust policy.

**Fig. 2.** The chapters



# 2 Competition Policy Analysis – An Integrated Approach

*You're gouging on your prices if you charge more than the rest. But it's unfair competition if you think you can charge less. A second point that we would make to help avoid confusion: Don't try to charge the same amount – that would be collusion.*

Richard W. Grant (1963)

## 2.1 Introduction

In this chapter, an integrated approach of competition policy analysis is developed. This approach comprises a progression of compulsory analytical steps toward creating and maintaining an efficient antitrust policy. An efficient antitrust policy consists of a set of effectively enforced rules that constrain the firms' competitive strategies aiming at maximising the total welfare contribution for a given enforcement budget. To put it differently, this chapter focuses on proposing ways of assuring that the introductory quote by Richard Grant stays a provocative poem, a far cry from reality, rather than a realistic description of contemporary antitrust policy.

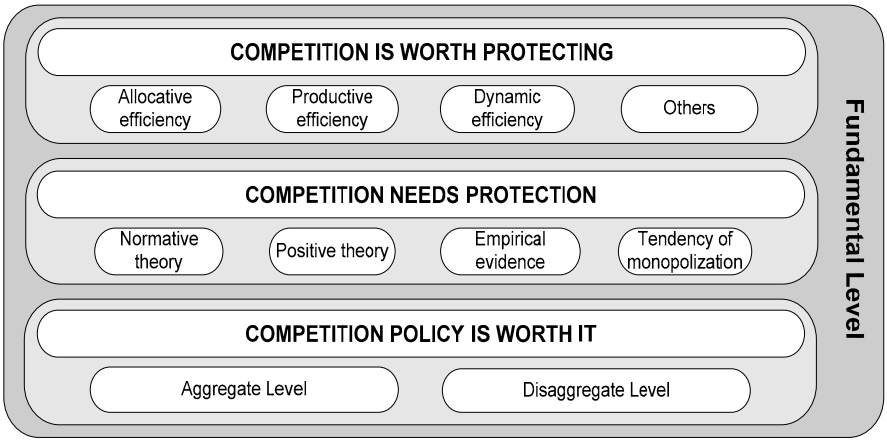
Three levels of investigation are analysed here. The *fundamental level* deals with existential questions of competition and competition policy. In particular, it assesses whether competition is worth protecting, whether competition needs protection and whether competition policy is bringing more benefits than costs to society. Subsequently, the *strategic level* develops a simple progression of necessary steps for – normatively – assessing whether and how certain conducts should be subject to antitrust policy. In addition to an initial characterisation of the business conduct, a welfare assessment and a concept of detection and intervention need to be developed to ensure an integrated approach of antitrust analysis. The third level, the *operational level,* aims at implementing the concepts developed on the strategic level in a world in which the antitrust authority faces resource constraints and imperfect information. This level therefore deals with approximation techniques such as the identification of the relevant market, the assessment of market power and the application of economic frameworks for deriving appropriate conclusions about the likelihood and the severity of anticompetitive effects in the cases at hand. In order to assure the universal applicability of the chosen inte-

grated approach, it is applied to hard core cartel enforcement and merger control on all three levels. Chapters 3 and 4 also build on the integrated approach and will focus on strategic behaviour in general and predation in particular.

## 2.2 Fundamental Level

The fundamental level of the integrated approach covers existential questions of competition and competition policy. In particular, it assesses whether competition is worth protecting, whether competition needs protection and whether competition policy is bringing more benefits than costs to society. Figure 3 summarises the analytical structure of the fundamental level.

**Fig. 3.** The fundamental level




As shown in Figure 3, one task of the fundamental level is to assess the costs and benefits of antitrust enforcement. In order to allow such comparisons on an aggregate as well as on a disaggregate level, the following sections will focus on possible quantifications of especially the benefits of competition and competition policy.

### 2.2.1 Competition Is Worth Protecting

Economists and philosophers have both studied competition and the benefits of competition in a multitude of ways. Notwithstanding the potential relevance of any of these efforts – some of which having been very influential, such as Adam Smith's 'invisible hand' or Friedrich August von Hayek's 'competition as a discovery procedure' – the most fundamental result of all these research efforts is probably the insight that competitive markets allocate resources efficiently be-

cause they provide products to all customers willing to pay the opportunity cost of production (see, for example, Debreu, 1959).

*Market power* is generally defined as a deviation from this competitive benchmark. If a company can profitably raise and maintain a price above its marginal cost (i.e., the market price under perfect competition), then it possesses some degree of market power. The degree of market power is maximised in a monopoly, as the company can set the profit-maximising market price absent of other firms.[10] Although both monopoly and perfect competition are typically artificial constructs, a comparison of both extremes is a fruitful way to derive an upper bound for the benefits of competition.

From a static perspective, the presence of monopoly leads to a welfare loss that results from the absence of customers who derive a value that is lower than the price of the product but greater than the marginal cost of production (see Chart 1a in Figure 4). The size of the welfare loss can be expressed as a function of the price-cost margin, industry revenue (a measure of market size) and the industry elasticity of demand (see Annex 6.6.1 for the proof):

$$DWL = \frac{1}{2} M^2 \cdot R^M \cdot \varepsilon_D \,. \tag{1}$$

Harberger (1954) undertook one of the first attempts to estimate the deadweight loss for 73 US manufacturing industries from 1924 to 1928. His estimations, based on Equation (1), led to a monopoly welfare loss of around 0,1%[11] of the Gross Domestic Product (GDP). Surprised by this (seemingly) small size of the welfare loss, Harberger concluded that "we can neglect monopoly elements and still gain a very good understanding of how our economic process works" (1954: 87). In response to Harberger's analysis and conclusion, economists undertook numerous attempts to recalculate the welfare triangle loss by replacing some of his oversimplifying assumptions and/or using different data sets (see, for example, Schwartzman, 1960; Kamerschen, 1960). Furthermore, scholars increasingly investigated the follow-up question, "If the conventional loss is so small, are there other, more significant losses?" (Farrell, 1983: 1).

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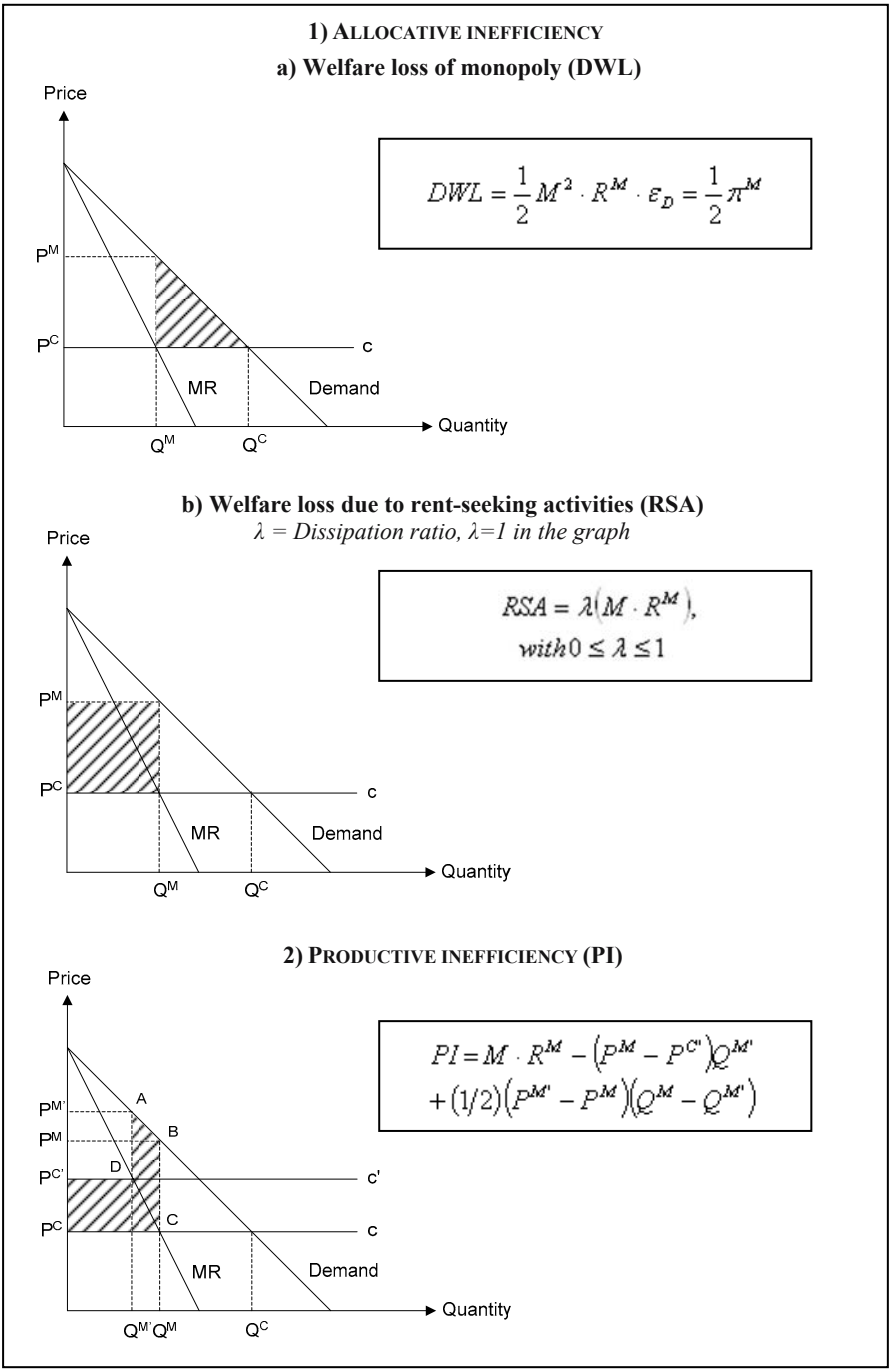
10 Although monopolists do not face constraints of direct competitors in their price-quantity decision, they cannot act independently. They maximise profits subject to demand conditions.

11 Please note that in order to comply with the graphs, which were created with German-language software packages, the comma is used in place of the decimal point (i.e., 2,0% instead of 2.0%) and the full stop in place of the comma (i.e., 5.000€ instead of 5,000€).

**Fig. 4.** Inefficiencies caused by the exercise of market power



One possible additional loss of monopoly was traced out by Tullock (1967). He pointed out that if firms compete to gain and to preserve market power, these resources diverted to unproductive activities must be added to the welfare loss of monopoly, and the overall loss therefore has the geometrical form of a trapezoid rather than a triangle. Referring to Chart 1b) in Figure 4, the additional welfare loss due to so-called rent-seeking activities is determined by the dissipation ratio λ (i.e., the percentage of the total rent dissipated by rent-seeking activities), the price-cost margin $M$ and the monopoly revenue $R^M$:[12]

$$RSA = \lambda\left(M \cdot R^M\right) with\, 0 \le \lambda \le 1\,. \tag{2}$$

Although rent-seeking expenses are typically viewed as a welfare loss of monopoly, Neumann (2000: 107) points out that such a classification of rent-seeking activities already involves a value judgment. This is because the expenses for rent-seeking activities are not lost surplus (as the deadweight loss discussed above) but rather income of other individuals and therefore not a loss of total welfare. Therefore, classifying rent-seeking activities as welfare loss depends on a value judgment that these expenses and the resulting incomes are of lower value than other incomes.

Posner (1975) was one of the first scholars who actually incorporated rent-seeking into a measure of *overall* welfare loss due to monopoly power. He studied the relative size of the deadweight loss and the resources wasted on competition to acquire and maintain monopoly profits and showed that the deadweight loss $DWL$ relative to the rent-seeking loss $RSA$ is given by

$$\frac{DWL}{RSA} = \frac{U^C}{2\left(1/\varepsilon_D - U^C\right)}, \tag{3}$$

with $U^C=\Delta P/P^C$ (price-cost markup). Equation (3) shows that the RSA is large relative to the DWL when $U^C$ is small. For instance, if $\varepsilon_D=1$ and the price-cost

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12 Tullock (1980) himself studied the determinants of the size of the dissipation ratio. He shows in a basic rent-seeking game that the expenditure on rent-seeking κ by each of the $n$ individual rent seekers is given by $\kappa = \left((n-1)/n^2\right)\left(M \cdot R^M\right)$. This means that if the rent to win (i.e., the monopoly profit) is given by 50 and there are 7 firms in the contest, each firm will spend about 6,12 in the contest. This would lead to an overall investment in the contest of 7*6,12 = 42,84 and a dissipation ratio of (42,84/50) = 85,7%. Hazlett and Michaels (1993) studied lotteries conducted by the US Federal Communications Commission to award cellular telephone licenses. There were 643 licenses available, and almost everybody was (seemingly) allowed to participate in the lottery (i.e., no barriers to entry were initially noticed). In such an environment, Hazlett and Michaels would have expected total rent dissipation (as $n$ is large, in fact about 320.000). However, their empirical results show that overall costs were $325 million, while the rents were estimated to about $611 million, leading to an (average) dissipation ratio of about 0,53. Hazlett and Michaels explain this result with the existence of entry barriers in the application process (such as a factual entry fee of nearly $3.500 per application due to general fees and attorney fees).

markup is given by 0,2, the loss due to rent-seeking activities is about 8 times larger than the deadweight loss. Using Harberger's data and estimate of the DWL, Posner estimated that, while the deadweight loss is 0,1% of GDP, rent-seeking activities account for about 3,3% of GDP, leading to an aggregated welfare loss due to monopoly of about 3,4% of GDP for the United States.

Cowling and Mueller (1978) also extended Harberger's work by changing several assumptions. For instance, instead of using unity elasticity, they applied the (inverse) Lerner index $(P^M/(P^M\text{-}MC))=\varepsilon$ and showed that the deadweight loss is then equal to half of the monopoly profits (see Annex 6.6.1 for the proof):[13]

$$DWL = \frac{1}{2} M \cdot R^M = \frac{1}{2}\left(P^M - MC\right)Q^M = \frac{1}{2}\pi^M . \quad (4)$$

By using this estimate, Cowling and Mueller avoided using separate estimates of the price markup and the demand elasticity (and therefore considered the interdependence of the observed price-cost ratios and of the value of the elasticity of demand; see, e.g., Clarke, 1985: 234). Furthermore, Cowling and Mueller also incorporated the cost of reaching and maintaining a monopoly by extending their study with several combined measures of deadweight loss and advertising expenses (as a measure for rent-seeking activities; see Table 1 for an overview of their measures). Their results show, depending on the used measure, aggregated welfare losses ranging from 3,96% to 13,14% for the United States and ranging from 3,86% to 7,20% of the Gross Corporate Product (GCP) or equivalent for the United Kingdom. An overview of influential studies on monopoly welfare losses is presented in Table 1.

Masson and Shaanan (1984) present a methodology for estimating welfare losses caused by market power which departs from the studies discussed thus far, because they explicitly take different levels of market power into account. The authors provide estimates for the actual social costs arising from existing market structures and the expected monopoly social costs that would occur if there were no competition. They define the difference between actual and monopoly welfare losses as the *value of competition* in existing markets. Masson and Shaanan find that the actual *oligopoly* deadweight loss averages 2,9% of the value of shipments for a sample of 37 US manufacturing industries from 1950 to 1966. Furthermore, they estimate a potential (average) monopoly deadweight loss of 11,6%, leading to a value of competition of 8,7% of the value of shipments.

13 Cowling and Mueller's results, however, hold only in the absence of fixed costs.

**Table 1.** Monopoly welfare loss estimates

| Study | Country | Measure | Welfare loss | Scope | Assumptions / Remarks |
|---|---|---|---|---|---|
| STUDIES FOCUSING SOLELY ON DEADWEIGHT LOSS | | | | | |
| Harberger (1954) | US | $0{,}5*M^2*R^M*\varepsilon_D$ | 0,1 | 2.046 firms in 73 US manufacturing industries from 1924 to 1928; | Unity elasticity, competitive rates of return given by average rate of return in sample |
| Schwartzman (1960) | US CAN | $0{,}5*(P^M-P^C)*z\pi$ | <0,1 | Sample of Canadian and US industries in 1954 | Used direct price-cost margins data; allowed elasticities up to 2 |
| Kamerschen (1960) | US | Similar to Harberger | 1,9 | US industry from 1956/7 to 1960/1 | Inclusion of other non-manufacturing and non-corporate sectors |
| Worchester (1973) | US | General equilibrium model of welfare loss | 0,43-0,73 | Data on 500 largest industrial individual firms from 1956 to 1969 | Used firm-level instead of industry-level data |
| STUDIES FOCUSING ON DEADWEIGHT LOSS AND RENT-SEEKING EXPENSES | | | | | |
| Posner (1975) | US | $DWL/RSA=(U^C/(2(1/\varepsilon_D-U^C)))$ | 3,4 | Uses Harberger data | Assumed that resources committed to rent-seeking equal revenues obtainable |
| Cowling/Mueller (1978) | US | $\pi/2$ | 3,96 | 734 large US firms from 1963 to 1969 | Used half monopoly profit rather than separate estimates for price-cost margins and elasticities; used independent estimate of the competitive rate of return; used firm-level monopoly profits; used advertising as estimates of rent-seeking expenditures |
| | US | $(\pi+A)/2$ | 6,52 | | |
| | US | $A+(\pi+A)/2$ | 12,27 | | |
| | US | $\pi'+A+(\pi+A)/2$ | 13,14 | | |
| Cowling/Mueller (1978) | UK | $\pi/2$ | 3,86 | Largest 103 UK firms from 1968 to 1969 | |
| | UK | $(\pi+A)/2$ | 4,36 | | |
| | UK | $A+(\pi+A)/2$ | 5,39 | | |
| | UK | $\pi'+A+(\pi+A)/2$ | 7,20 | | |

Welfare loss is in % of GNP or equivalent; C&M use gross corporate product; *z* is arc elasticity of demand; *A* is advertising; and $\pi$ and $\pi'$ are pre- and post-tax profits (see Clarke 1985: 235).

Davies and Majumdar (2002: 30ff.) express their concern about the general value of measuring deadweight losses of monopoly for large parts of economies because of the oversimplifications which are necessary for such a quantification (such as an average demand elasticity and an average price-cost margin for large parts of an economy). However, in aiming at showing the sensitivity of such models, they adopt the methodology of Cowling and Mueller (1978) and apply the well-known relationship in a homogenous Cournot model that the price-cost margin equals the Herfindahl-Hirschman concentration index (HHI) divided by the market demand elasticity. Making use of this relationship by inserting it into the general deadweight loss formula derived above leads to the following estimate for the deadweight loss (see Annex 6.6.1 for the proof):

$$DWL = \frac{1}{2} HHI \cdot M \cdot R^M . \tag{5}$$

As Equation (5) shows, the DWL now depends on a measure of market concentration, namely the Herfindahl-Hirschman index, which is somehow easier to estimate than market demand elasticity (as a lot of countries have statistics at least for major industries). In the following, Davies and Majumdar (2002: 31) attempt to calibrate Equation (5) for the UK. For the average price-cost margin, they decide to use a value of 0,1 as a defensive estimate, compared to a value of 0,08 used by Cowling and Mueller and a broader survey by Scherer and Ross (1990), which found price-cost margins between 0,1 and 0,2. In terms of HHI, they assume a value of 0,1 (in a properly defined market), largely based on rough approximations due to the fact that the UK only publishes data on concentration ratios.[14] Inserting the *M* and *HHI* values in Equation (5) leads to an aggregated welfare loss of 0,5% of GDP.

A third kind of possible loss due to monopoly is the loss in productive efficiency if a monopoly slacks off and prefers 'the quiet life' to profit maximisation. As shown in Chart 2 in Figure 4, such inefficiencies lead to a higher marginal cost level and a corresponding welfare loss given by[15] (see Annex 6.6.1 for the proof):

$$PI = M \cdot R^M - \left(P^M - P^{C'}\right)Q^{M'} + \frac{1}{2}\left(P^{M'} - P^M\right)\left(Q^M - Q^{M'}\right). \tag{6}$$

At first glance, it seems implausible why the shareholders of a monopoly firm would be less willing to keep costs down (and let slacking happen) than those of a competitive firm (see Rasmusen, 2000: pt. VII, no. 33). To the question "Why

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14 For the United States, data on the Herfindahl-Hirschman indices for 443 US manufacturing industries (four-digit SIC) for the year 1992 is available (see www.census.gov/ epcd/www/concentration.html). The average HHI for the US for these industries in 1992 can be calculated to 725,49.

15 In the same way as explained for the case of rent-seeking activities, a value judgment stating that society values the distribution of pecuniary and non-pecuniary rents in a quiet-life monopoly state less than the results that competition would bring is needed in order to interpret the entire hatched area in the third chart in Figure 4 as a welfare loss due to monopoly (see also Neumann, 2000: 107).

would a monopolist spare efforts to reduce costs when it stands to reap all the incremental profits arising from the cost reduction (i.e., when it does not have to worry about the incremental profits being competed away)?" (Chen and Chen, 2005: 25), Farrell (1983) provides an intuitive explanation based on the separation of ownership and control. In a world of imperfect information, managers find it costly to search for better techniques. The firm itself cannot reliably tell when the manager is searching, and so cannot reimburse him for these costs. The firm also cannot reliably tell by results whether or not the manager has been diligent partly due to missing comparator firms. The best the shareholders can do is to provide a contract with some incentive to increase profits; however, the manager's risk aversion limits the effectiveness of such contracts.[16] According to Farrell (1983: 1), "[t]he inefficiency which results is ameliorated if more information becomes available about the manager's activities; and, if there is a competing firm, the market interaction may convey such information" .[17]

Empirical evidence on productive inefficiencies is diverse but still fragmentary (see Davies and Majumdar, 2002: 35ff.). In probably the most influential paper, Nickell (1996) investigates the question whether competition improves corporate performance. His results based on an analysis of 670 UK companies largely support this view. Nickell finds that market power – captured by market share – generates reduced levels of productivity. More importantly, he presents evidence that competition is associated with a significantly higher rate of total factor productivity growth. Furthermore, a study by Jenny and Weber (1983) derive an estimate for productive inefficiencies in France of 5,18% of GDP for the years 1971 to 1974. Additionally, Ahn (2002: 53ff.) provides an overview of the main methods and main findings of further studies on the competition-productivity relationship in certain sectors or industries (see especially Bailey, 1993; Baily and Gersbach, 1995; Zitzewitz, 2003; Disney et al., 2000). The results mostly show that increases in product market competition led to increases in the overall levels of productive efficiency. In line with these findings, Scherer and Ross (1990: 672) conclude their survey on productive inefficiencies by expressing their belief that productive inefficiencies are "at least as large as the welfare losses from resource misallocation."

An alternative to the study of the general relationships between competition and productivity across different product markets is an analysis of recently liberalised sectors. In such environments, economic theory would expect significant productivity improvements after deregulation due to the correction of inefficiencies typically caused by economically largely obsolete regulation schemes (see

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16 Nalebuff and Stiglitz (1983: 281) argue in a comparable way by focusing on principal-agent problems and conclude that monopoly does not cause productive efficiency losses in an owner-managed firm.

17 As discussed in more detail in McAfee and McMillan (1996: 263ff.), 'revealing hidden information' is an important characteristic of competition from a game-theoretical point of view. Other important characteristics include: 'competition works better than bargaining', 'competition creates effort incentives' and 'competition mechanisms are robust'.

OFT, 2007). Certainly, the almost unanimous result of studies by Maher and Wise (2005), Ehrlich et al. (1994), Pilat (1996) and Griffith and Harrison (2004) is that deregulation in such industries as electricity, gas, water, airlines and road freight led to substantial increases in total factor productivity growth. An overview of the results of several studies focusing on improvements in productive efficiency (as well as consumer welfare) after regulatory reforms in the United States is presented in Table 2.

**Table 2.** Improvements in productive efficiency and consumer welfare after regulatory reforms in the United States

| Industry | Studies | Improvements in productive efficiency | Improvements in consumer welfare |
|---|---|---|---|
| Airlines | Morrison and Winston (1998) | Average industry load factors have increased from roughly 52% the decade preceding deregulation to roughly 62% since deregulation. Real costs per revenue ton-mile have declined at least 25% since deregulation. Industry profits have been very volatile during deregulation, although higher, on average, than they would have been under regulation. | Average fares are roughly 33% lower in real terms since deregulation, and service frequency has improved significantly. |
| Less-than-truckload trucking | Corsi (1996a) | Carriers have substantially reduced their empty miles since deregulation. Real operating costs per vehicle mile have fallen 35%, but operating profits are slightly lower than they would have been under regulation. | Average rates per vehicle mile have declined at least 35% in real terms since deregulation, and service times have improved significantly. |
| Truckload trucking | Corsi (1996b) | Carriers have substantially reduced their empty miles since deregulation. Real operating costs per vehicle mile have fallen at least 75%, but operating profits are slightly lower than they would have been under regulation. | Average rates per vehicle mile have declined at least 75% in real terms since deregulation, and, because of the emergence of advanced truckload carriers, service times have also improved significantly. |
| Railroads | Winston et al. (1990) | Railroads have abandoned one-third of their track miles since deregulation. Real operating costs per ton-mile have fallen 60%, and rail profits are much higher than they would have been under regulation. | Average rates per ton mile have declined more than 50% in real terms since deregulation, average transit time has fallen at least 20%, and the standard deviation of transit time has fallen even more than 20%. |

| | | | |
|---|---|---|---|
| Banking | Berger et al. (1995) | The real cost of an electronic deposit has fallen 80% since deregulation. Operating costs have declined 8% in the long run because of branch deregulation. Recent industry returns on equity exceed those just before deregulation. | Consumers have benefited from higher interest rates, better opportunities to manage risk, and more banking offices and automated teller machines. |
| Natural Gas | Henning et al. (1995); Costello and Duann (1996); Crandall and Ellig (1997) | Pipeline capacity has been much more efficiently utilised during peak and off-peak periods since deregulation. Real operating and maintenance expenses in transmission and distribution have fallen roughly 35%. | Average prices for residential customers have declined at least 30% in real terms since deregulation, and average prices for commercial and industrial customers have declined even more than 30%. In addition, service has been more reliable as shortages have been almost completely eliminated. |

Source: Winston (1998).

In addition to the described efforts to estimate the *true* welfare losses due to monopoly[18], some scholars argue that the economic impact of even small welfare losses can be substantially larger if other factors are taken into account. Dickson (1982), for instance, shows that a small welfare loss in a monopolised market can cause multiple damages if the transmission of monopoly distortions though successive vertical stages is considered. Neumann (1999) contributes to the discussion by adding the intertemporal dimension. He uses a simple growth model to estimate the effect of a static welfare loss due to monopoly on the growth rate of the GDP and indeed finds that the long-run welfare loss due to monopoly typically dwarfs the static loss analysed above.[19] Kwoka (2003: 11) remarks that it is not the average deadweight loss (derived by an average demand elasticity and an average price-cost margin for large parts of an economy) that matters but rather its distribution. Losses are greater in several industries where competition does not reign, and the deadweight losses can be quite substantial in these industries (although relatively low on average).

Although the analysis thus far has drawn a solely negative picture of monopoly with respect to its (static) welfare effects, economic analysis has shown that this is not generally the case. Economies of scale, for example, are one prominent reason why a monopolistic market structure might occasionally be socially desirable. On

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18 The maximum welfare loss due to monopoly is given by $(1/2)\left(P^{M'} - P^{C}\right)\left(Q^{C} + Q^{M'}\right)$. See Annex 6.6.1 for the proof.

19 In a simplified example, Neumann (2000: 110f.) shows for a fixed interest rate and potential growth rate that a static welfare loss of 0,1% (the Harberger estimate) would lead to a yearly welfare loss of about 1%. A static welfare loss of 3% (one of the Cowling and Mueller estimates) would lead to a long-term welfare loss of about 26% per year.

the supply side, economies of scale can lead to situations in which a monopoly is able to supply the entire market at a lower unit cost than two or more firms. Technically, such *natural monopolies* exist if the demand curve intersects the average cost curve in its downward-sloping or subadditive part. On the demand side, economies of scale are reflected in the so-called network effects:[20] As the value of a network for an individual increases with the number of users,[21] the overall value is maximised in a monopoly network and a fragmentation would lead to consumer welfare losses.

In addition to a discussion of the largely static concepts of allocative and productive efficiency, a fundamental benefit of competition is seen in its ability to meet customer requirements *dynamically* and to ensure that old inferior products are replaced by superior new products. As stated by Kolasky and Dick (2002:6),

> Dynamic efficiency arises from market processes that encourage innovation to lower costs and develop new and improved products. Whereas allocative and productive efficiency can be viewed as static criteria – holding society's technological know-how constant – a more dynamic view of efficiency examines the conditions under which technological know-how and the set of feasible products optimally can be expanded over time through means such as learning by doing, research and development, and entrepreneurial creativity.

From such a dynamic point of view, it has been discussed extensively in the economic literature whether market power must be seen as an important precondition for technical progress and therefore, to a certain extent, as socially desirable.[22] Notwithstanding the existence of such a trade-off between static and dynamic efficiency, the empirical evidence by the majority shows that monopoly power is more likely to slow down the pace of innovative activity[23] (see, for ex-

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20 See Farrell and Klemperer (2006: 58f.) for a discussion as to why network effects are not always (positive) externalities. Generally, negative externalities (such as pollution caused by a production process) might be another reason to prefer monopoly over competition, simply because a monopoly reduces output and therefore reduces the negative externality. However, it is likely that an optimally regulated market in such a case would reach better performance levels than either monopoly or perfect competition.

21 If there are *n* people in a network and the value of the network to each of them is proportional to the number of other users, then the total value of the network to all the users is proportional to $n(n-1)=n^2-n$. For example, a tenfold increase in network size leads to a hundredfold increase in its value. This relationship is known as Metcalfe's Law (see Shapiro and Varian, 1999: 184). Given the functional form, it is obvious that demand-side economies of scale do not dissipate (as supply-side economies do when the market gets large enough).

22 See Evans and Schmalensee (2001) and Shapiro and Varian (1999) for overviews and discussions of implications for business strategy and public policy.

23 From a theoretical perspective, the relationship between market power and process innovations can be characterised by two conflicting effects. The *replacement effect* (Arrow, 1962) speaks for lower innovation incentives for a monopolist compared to a competitive industry (under the assumption that the respective firms are in each case the only firms who could implement the respective process innovation[s]). The basic

ample, Weigand, 1996; Audretsch, 1995; Geroski, 1990). However, recent discussions on 'very innovative industries' with winner-take-all markets suggest that although these firms might be dominant in their market, they face the constant threat of being replaced by firms seeking to develop better products. Following Schumpeter (1942), these monopolists competed vigorously, not necessarily in the market but for the market (see Veljanovski, 2006: 119f. and Geroski (2003) for round-ups). As a consequence, a (temporary) high level of market power in such markets might be socially desirable.

An acknowledgment of the importance of market power in keeping up innovation incentives can be seen in the existence of patent systems. As part of such a system, the state factually grants temporary monopolies to innovative firms in the form of patents. This is seen as a necessary instrument to allow these firms to recoup their investments in research and development by avoiding immediate imitation by rivals. A patent system is therefore a necessary public policy instrument to keep up the innovation incentives for firms and therefore ensure technological progress and economic development.

In addition to allocative, productive and (possibly) dynamic inefficiencies[24], the distributional effects of market power might be another reason to prefer competition over monopoly. As prices above marginal costs not only lead to net losses in overall welfare but also to a (total welfare-neutral) transfer of consumer surplus into producer surplus, market power also influences the process of wealth creation as well as the distribution of wealth in a society. Comanor and Smiley (1975) investigate the impact of enterprise monopoly profits on the distribution of household wealth in the United States between 1890 and 1962. They basically find that past and current monopoly has had a major impact on the current degree of inequality in the distribution of wealth. Creedy and Dixon (1998) estimated the relative burden of monopoly, measured as the static loss of consumer surplus for different household income levels, and find that the welfare loss associated with monopoly power is higher for low-income households compared with high-

reason for the lower incentives of the monopolist is that by being innovative he is just replacing an already high (monopoly) revenue stream with a revenue stream that is-even a bit higher. The competitive firm, on the other hand, starts from a situation of zero profits and therefore has higher incentives to implement the process innovations. If it is, however, assumed that both the monopolist and a potential rival are able to implement a certain process innovation, the *efficiency effect* shows that a monopolist now has a higher incentive to be innovative than his rival from the competitive industry, because he is in danger of losing his high monopoly excess profits in case the rival firm implements the process innovation (Gilbert and Newbery, 1982).

24 A fourth efficiency type which might be distorted by the presence of market power is the *transactional efficiency*. "The basic insight offered by the school of thought known as 'transaction cost economics' is that market participants design business practices, contracts, and organisational forms to minimise transaction costs and, in particular, to mitigate information costs and reduce their exposure to opportunistic behavior or 'hold-ups' … transactional efficiencies frequently facilitate firms' efforts to achieve allocative, productive, and dynamic efficiencies" (Kolasky and Dick, 2003: 249).

income households. However, as Martin (1994: 38) has pointed out, the decision whether this is considered a problem from a social point of view is a matter of politics rather than economics.

In a nutshell, this section has characterised several important economic arguments why monopolies are typically inferior to competition from a total welfare point of view. Although the striving for a monopoly position remains probably the most important individual motivation for undertaking business activities[25], the permanent (ab)use of such a position likely leads to welfare-reducing inefficiencies. Although empirical studies on deadweight and rent-seeking losses show that the performance differential between perfect competition and monopoly can be surprisingly small, a closer interpretation of these results show that the true losses are very likely significantly larger. Therefore, economists might still serve a more useful purpose in fighting monopolies instead of fires or termites.[26]

### 2.2.2 Competition Needs Protection

The finding that competition is typically worth protecting is a necessary but not sufficient condition to justify a need for some kind of competition policy. Although the desirability of competition is probably one of the few things most economists generally agree upon, different schools of thought arrive at quite different answers to the questions of whether protection is needed and what kind of protection is needed. The spectrum reaches from laissez-faire approaches with no or only skeletal antitrust rules to quite interfering approaches which plan to create an 'optimal competition intensity'.

Without wanting to enter into these debates in detail (see, for example, Kovacic and Shapiro, 2000; Mueller, 1996; and van den Berg and Camesasca, 2001, for overviews of US and EU antitrust policy history), the basic theoretical justification for some kind of antitrust policy is its potential to reduce the so-called deadweight welfare loss of market power and, consequently, to realise better market performances than without such a policy. If the aim of antitrust policy is simply to promote economic efficiency, then the additional allocative inefficiency caused by productive inefficiencies (trapezoid *ABCD* in the third chart in Figure 4) must

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25 The importance of (temporary) market power as a key element in market systems is expressed in great clarity by Justice Antonin Scalia in the US Supreme Court's Trinko (2004) decision: "The mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element of the free-market system. The opportunity to charge monopoly prices at least for a short period is what attracts business acumen in the first place; it induces risk taking that produces innovation and economic growth. To safeguard the incentive to innovate, the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct" (Verizon Communications v. Law Offices of Curtis V. Trinko LLP, 540 U.S. 398, U.S., 2004).

26 The original quote stems from George Stigler (1966) who once stated that „economists might serve a more useful purpose if they fought fires or termites instead of monopoly".

be added to the deadweight loss to trace out the overall potential of antitrust policy to improve total welfare. The inclusion of rent-seeking activities and the fraction of productive inefficiencies without allocative distortions is only feasible if the underlying aims of competition policy are changed (for example, by adopting a consumer surplus standard) or extended (for example, by including the aim of promoting a fair income distribution).[27]

Antitrust policy, as opposed to regulation, is applied in markets in which the competitive process is viable in principle, and only occasionally endangered by actions of individual firms or groups of firms. Therefore, as Geroski (2004: 4) indicates, competition policy only "swings into operation when serious, egregious problems are believed to exist". Although most economists would probably still agree on the desirability of these selective and episodic swings in an artificial world of perfect information, a considerable group of scholars becomes sceptical about how to decide *when* to swing as well as about the accuracy of the swings in a world of imperfect and incomplete information, in which the antitrust authority has to judge on complex forms of business behaviour in complex markets with a multitude of knock-on effects. Especially in such environments, it is believed that market forces (at least in the long run) will automatically select the most efficient firms and lead to efficient market outcomes. Antitrust interventions, on the other hand, are believed to do more harm than good, especially because "economists … have not reached a consensus about the ultimate effects of various business practices ... [I]t seems likely that well-intentioned prosecutors and judges face ... some difficulty in distinguishing good from bad business practices" (Bittlingmayer, 1996: 371).

The so-called private interest theories of regulation (and antitrust) even go one step further and question the general existence of well-intentioned prosecutors. These theories are based on the disbelief that the responsible individuals really base their decisions on the public aim of promoting economic efficiency. Stigler (1971), for instance, argues that enforcers – as well as politicians – will get captured by interest groups, and that these groups will use their regulatory and coercive powers to shape laws and regulations in a way that is beneficial to them (see Hüschelrath, 2005: 192ff., for a general description of these theories in a regulatory context). These public versus private-interest explanations for the development and persistence of antitrust law and enforcement are investigated back to the passing of the Sherman Act in the United States in 1890[28] (see Box 1 for an overview and Rowley and Rathbone, 2004, for a survey).

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27 The economic literature discusses a multitude of aims of competition policy. Motta (2004: 177ff.), for instance, discusses welfare, consumer welfare, defense of smaller firms, promoting market integration, economic freedom, fighting inflation, fairness and equity, as well as other public policy factors effecting competition. See also Furse (1996) for a discussion on different aims of competition policies in the United States, the European Union and the United Kingdom.

28 Ghosal and Gallo (2001) study the cyclical behaviour of the US Department of Justice's antitrust enforcement activity between 1955 and 1994. They find that case activity is countercyclical; i.e., in an economic downturn, antitrust enforcement activity

**Box 1.** Congressional intent on passing the Sherman Act

The motivations of the US Congress on passing the Sherman Act in 1890 has been the subject of several economic studies (see, for example, DeLorme et al., 1997). In general, two types of economic explanations are offered. The first type is based on a *public interest theory* of antitrust and assumes that government interventions are motivated by correcting market inefficiencies resulting from monopolies. From that perspective, antitrust laws were initially designed to prevent higher prices and consequently to reduce wealth transfers from consumers to producers (see, for example, Bork, 1966). The second type is based on a *private interest group theory* and assumes that special interest groups pressure legislators to create regulations that promote market inefficiencies. In other words, these approaches argue that US antitrust laws were designed to generate higher prices and lower outputs, protecting some special-interest groups rather than consumers (see, for example, DiLorenzo, 1985; Shughart and Tollison, 1991; Shughart, 1996).

In addition to opportunistic behaviour of captured politicians and enforcers, the companies themselves might strategically (ab)use antitrust policy for their own purposes. Baumol and Ordover (1985: 263) identified that such rent-seeking behaviour by competitors is widespread (and costly to the economy) and consequently asked for easy and costless remedies for such abuses of antitrust "by those who use it for protection from competition". McAfee and Vakkur (2004) developed a taxonomy of strategic uses of antitrust laws.[29] They identified the following seven strategic (ab)uses: 1) Extort funds from successful rival; 2) change the terms of the contract; 3) punish non-cooperative behaviour; 4) respond to an existing lawsuit; 5) prevent a hostile takeover; 6) discourage the entry of a rival; and 7) prevent a successful firm from competing vigorously. Without wanting to go though the whole taxonomy (see McAfee and Vakkur, 2004: 4ff.), a prominent example of a misuse of antitrust law (reflected in points 1 and 2 of the taxonomy) is to extort funds of a successful rival by saying, Give me something (cash, better contract terms) and I will not expose your vulnerability to an antitrust lawsuit. Another typical misuse (reflected in point 3) exploits the expensive nature of anti-

increases, and vice versa. Based on this empirical finding, the authors conclude that private interest group theories of antitrust enforcement are not supported, as they would expect increases in producer protection in economic downturns (i.e., procyclical enforcement). One possible explanation for the identified countercyclical pattern of antitrust enforcement activity is that the number of antitrust violations increases in economic downturns.

29 It is important to remark that the literature on the strategic abuse of antitrust law concentrates on a system of private antitrust enforcement which is predicated on the idea that firms can sue firms. It is straightforward to see that such a system (as applied in the US) opens more possibilities for strategic behaviour than a system of public enforcement (such as currently dominant in the EU), in which the firms can only inform the antitrust authority about possible breaches of competition law but typically cannot directly bring a suit against a competitor. Such a system is likely to provide fewer opportunities for the strategic abuse of antitrust laws.

trust lawsuits and the fact that it is typically cheaper to bring a lawsuit than to defend against one.[30] This opens possibilities, for instance, to use antitrust law as a (threat of) punishment for the purpose of enforcing collusive agreements. In line with this argumentation, Yao (1998: 355ff.), in his survey on antitrust restrictions of competitive strategies, differentiates between strategies that simply include antitrust restrictions in business decisions defensively[31] and strategies that use antitrust as an aggressive strategic weapon; for instance, to reach a ban for a certain merger which might threaten the own market position.

From an empirical perspective, one way to investigate the necessity of competition policy is to analyse historic episodes with no or only lax antitrust enforcement. In the United Kingdom, Adam Smith (1776) already used this approach in his *An Inquiry into the Nature and Causes of the Wealth of Nations* and observed a general 'tendency for collusion'. In Germany, Walter Eucken, amongst others, analysed historical experiences and found a 'tendency of monopolisation'[32] (1952: 31). He concludes that competition policy is necessary to secure competitive market structures in the medium and long term and generally to preserve freedom and organisation of the economic system (*Wirtschaftsordnung*).

More recently, Baker (2003: 42) concluded that "[c]ompetition does not invariably happen by itself", as firms have incentives to restrict competition either

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30 Bizjak and Coles (1995) study the implications for shareholder wealth of inter-firm (so-called private) antitrust litigation and find that the average defendant loses more than the average plaintiff gains. The average wealth loss for defendants is a statistically significant 0,6% of the equity value, or an average of $4 million. Given the fact that managerial compensations are often linked to performance, the negative price reaction for the defendant upon a filing suggests that lawsuits can provide significant incentives for firms to comply with antitrust laws. The average wealth gain for a plaintiff was estimated at approximately 1,2% of the equity value of the firm, or equivalently an average gain of $3 million.

31 The relevance of so-called antitrust compliance programs as an integral part of a firm's business strategy is shown by Yoffie and Kwak (2001). They explain how Intel avoids antitrust litigation while Microsoft has to cope with multiple antitrust suits. "Intel's success is not a matter of luck. It's a matter of painstaking planning and intense effort. The company's antitrust compliance program, refined over many years, may not receive a lot of attention from the press and the public, but it's been an integral element in the chip maker's business strategy. In an age increasingly characterised by global markets that are dominated by a few huge companies, Intel's approach to compliance provides a valuable model for any enterprise that may come under regulators' scrutiny" (Yoffie and Kwak, 2001: 120). In the past, Michael Porter had been criticised for not considering antitrust violations in his books on *Competitive Strategy* and *Competitive Advantage* (see especially Fried and Oviatt, 1989).

32 "Anbieter und Nachfrager suchen stets – wo immer es möglich ist – Konkurrenz zu vermeiden und monopolistische Stellungen zu erwerben oder zu behaupten. Ein tiefer Trieb zur Beseitigung der Konkurrenz und zur Erwerbung von Monopolstellungen ist überall und zu allen Zeiten lebendig. … Universal besteht der 'Hang zur Monopolbildung' – ein Faktum, mit der alle Wirtschaftspolitik zu rechnen hat." (Eucken, 1952: 31).

collusively or exclusively. He substantiates his view (pp. 36ff) by evaluating evidence from four episodes of no or lax antitrust enforcement in the United States:

- *Industry performance before and shortly after the enactment of the Sherman Act (1890)*
  Studies of major industries during that period show successful though imperfect collusion in steel (Scherer, 1996), bromine (Levenstein, 1997), railroads (Elli son, 1994; Porter, 1983) and petroleum refining (Granitz and Klein, 1996). The activities of Standard Oil and American Tobacco also illustrated harmful exclusionary behaviour and showed the effects of anticompetitive mergers (see Granitz and Klein, 1996; Burns, 1986; Lamoreaux, 1985).
- *Industry performance in sectors in which the United States has successfully repealed the antitrust laws as they apply to export cartels (since 1918)*
  Dick (1996) conducted a study on 111 cartel episodes covering 93 industries during the years 1918 to 1965 and found many examples of long-lived export agreements motivated by price-fixing; he also found, however, examples of cartels undermined by price wars and fringe competition.
- *Industry performance during the National Industrial Recovery Act (mid-1930s) which allowed industries to develop the Codes of Fair Competition*
  Several industries used the Codes as a vehicle for price-fixing through various methods. Studies by McGahan (1995), focusing on breweries, and Baker (1989), analysing steel producers, show that at least these industries exploited the opportunity to collude and even managed to stabilise agreements for years after the Codes were declared unconstitutional.
- *Industry performance during the second term of the Reagan administration (mid-1980)*
  The second period of the Reagan administration was a period of relaxed antitrust enforcement (see Box 2 for some empirical evidence), during which the antitrust authorities wanted to prevent certain likely anticompetitive mergers, but the transactions were nevertheless later permitted (e.g., by the Department of Transportation). In particular, the acquisitions of Republic Airlines by Northwest Airlines and the purchase of Ozark Air Lines by Trans World Airlines were both characterised by substantially overlapping route networks of the merging parties. A study by Peters (2006), among others, shows that these mergers indeed led to higher fares (as well as a decrease in service quality) in some markets with estimated average price increases of at least 5-10% in city pairs where the two carriers had previously competed (see Pautler, 2003: 167ff., for an overview). Hüschelrath (1998b: 347ff.) shows that the belief that airline markets are 'perfectly contestable' in the sense of the theory of Baumol, Panzar and Willig (1982) led to the approval of these mergers.

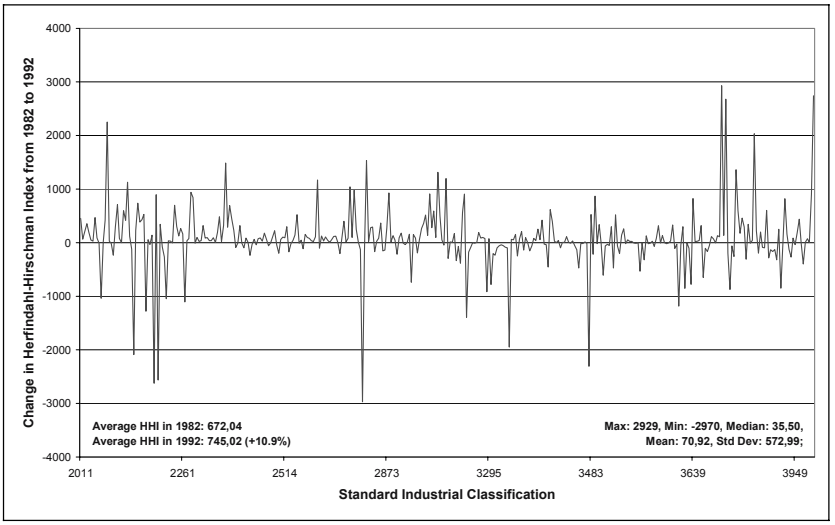
An alternative way to study the effects of antitrust policy is to look at cross-national studies. In a recent working paper, Krakowski (2005), for instance, explores the relationship between competition policy, experience in the application of competition policy, the intensity of local competition and the standard of living. He finds that the effectiveness of antitrust policy has a significant influence on the intensity of local competition. Furthermore, his results show that in coun-

tries with a high intensity of local competition, the standard of living is higher than in countries with a low intensity of local competition.

**Box 2.** Did lax antitrust enforcement in the 1980s increase concentration?

In the United States, the 1980s were characterised by a lax antitrust enforcement, partly due to the influence of the Chicago School of Antitrust. In such a state, one would expect an increase in concentration due to anticompetitive mergers and successful monopolisation strategies. Based on a data set of concentration measures for 360 US manufacturing industries, the graph below shows the changes in the Herfindahl-Hirschman index from 1982 (the beginning of the lax period) to 1992 (after the end of the lax period).

**Fig. 5.** Change in Herfindahl-Hirschman index from 1982 to 1992




Source: Own calculations based on data from US Census of Manufactures, Concentration ratios in manufacturing 1982 and 1992 (www.census.gov/epcd/www/concentration.html). Herfindahl-Hirschman index changes may partly be influenced by changes in the SIC structure from 1982 to 1992.

The graph as well as the calculated averages show that industrial concentration indeed increased in these ten years by about 10% on average. Although causality between this development and lax antitrust enforcement cannot be substantiated with the data at hand, it is especially interesting to see that the concentration in several industries increased dramatically, while others experienced a deconcentration process. This indicates that studying industry averages alone might say little about concentration effects of lax antitrust enforcement. Additionally, it has to be kept in mind that the graphs only show manufacturing industries and therefore miss important industries (such as the airline industry) in which concentration effects due to lax antitrust enforcement can be expected to be substantial (see Baker, 2003: 38).

Baker (2003) summarises studies which seek to understand why some nations have grown wealthy and others have not. These studies find almost unanimously that impediments to competition impede innovation, growth and prosperity (see, for example, Baumol, 2002; Shleifer and Vishny, 1998; Olson, 1982). Similarly, studies by business economists (see, for example, Porter, 1990) allow drawing the conclusion that differences in the power of competition across developed countries have been an important factor in explaining the difference in the performances of major industries across economies.

Although the historical review so far corroborates the need for some kind of antitrust policy, there is also oppositional evidence. Crandall and Winston (2003) collected historical evidence to underpin the view that antitrust policy was not successful in the past in terms of maximising consumer welfare. Their study, however, was heavily criticised – partly for its selective choice of empirical studies – by antitrust experts such as Connor[33] (2004), Kwoka (2003) and Werden (2003).

Bittlingmayer (2001) investigates the detrimental effects of antitrust enforcement on investment behaviour and industry structure. He uses antitrust case filings as a measure of regulatory uncertainty aiming at explaining some of the variation in industry investment by appealing to political or regulatory uncertainty. His results imply that the low investment level of the late 1950s and early 1960s in the United States was due at least in part to a resurgence of aggressive antitrust and related initiatives. He concludes that "whatever the ability of antitrust to lower prices and increase output in theory or in isolated circumstances, one actual effect of antitrust in practice may have been to curtail investment" (Blittlingmayer, 2001: 322).

Shleifer and Vishny (1991) argue that while lax enforcement may lead to monopoly, tough enforcement could lead to an even worse industry structure: namely one dominated by conglomerates (see Box 3). Therefore, the authors vote for a lax merger enforcement standard.

In a nutshell, it was shown that mainstream theoretical analysis – as well as the majority of empirical studies – comes to the conclusion that competition needs protection and – more importantly – that evidence has shown that competition policy actually helped to improve market performance, industry performance and the performance of the whole economy. However, it is important not to disregard the sceptical views on antitrust but to interpret them as a cornerstone of the continuous improvement of antitrust enforcement. Antitrust interventions have to be aware of enforcement's significant influence on manager's decisions, market behaviour and industry structure. In order to minimise uncertainty caused by antitrust enforcement, it must be the aim to develop, as clearly as possible, rules which are based on sound economic theories but understandable and applicable for people with academic backgrounds other than economics.

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33 Connor (2004: 1), for instance, writes: "This paper is an oddly slap-dash product far below the usual standards of the Journal of Economic Perspectives."

**Box 3.** Monopolies or conglomerates?

Shleifer and Vishny (1991) review evidence on takeover waves in the 1960s and 1980s in the United States and discuss the implications of this evidence for corporate strategy, agency theory, capital market efficiency and antitrust policy. With respect to antitrust policy they generally find that it played an important role in the two takeover waves. "The extremely strict antitrust enforcement in the '60s made most related acquisitions infeasible, or at least costly, and so forced firms determined to make acquisitions to diversify" (Shleifer and Vishny, 1991: 58; see Matsusaka, 1996, for antithetic evidence). In other words, antitrust policy was at least partly responsible for the diversification wave at that time. In direct comparison to that, the authors argue that even if one sees some problems with the takeover wave (made possible due to lax antitrust enforcement) in the 1980s, it is hard to believe that they will turn out as bad as diversification in the 1960s. Consequently, Shleifer and Vishny (1991: 58) conclude that "[i]n a first best world, aggressive antitrust may be a good idea. But, in the world where corporations are committed to growth though acquisitions, antitrust policy of the '60s … had inadvertent effects much more damaging than the benefits it created. … There's no question that … lax [antitrust] policy has led to some anticompetitive mergers, such as those in the airline industry, but it is better to have a few monopolies than a lot of conglomerates."

### 2.2.3 Competition Policy Is Worth It

Even after concluding that competition is worth protecting and also (regularly) needs protection, the case for antitrust enforcement is still not closed. In a third step it has to be shown that the benefits of antitrust enforcement likely exceed its costs. In the words of Geroski (2004), the question Is competition policy worth it? has to be answered.

In general, there are two ways to approach such a question. On an *aggregate level*, it can be assessed whether competition policy as a whole brings more benefits to society than it costs.[34] On a *disaggregate level*, it can be investigated

[34] As argued by Kee and Hoekman (2003), the benefit of competition policy needs to be compared with the potential benefit of other policy options which could foster competition. Based on an empirical study of an international data set consisting of 28 industries in 42 developed and developing countries from 1981 to 1998, the authors indeed conclude that reducing trade barriers and government regulations (as two major restrictions of domestic competition by impeding entry and exit of firms) would likely generate a higher rate of return than the adoption and enforcement of competition law. However, the increased significance of especially international cartels, despite shrinking trade barriers, suggests that reductions in trade barriers and government regulations are complements rather than substitutes to competition policy norms. In other words, although trade liberalisation and reductions of government regulations are typically worth promoting from an economic perspective, they do not make competition policy norms obsolete.

whether and to what extent certain sub-activities of the antitrust authorities – such as cartel or merger enforcement – contribute to the overall benefits of antitrust policy.

#### 2.2.3.1 Aggregate Level

In the following sections, the aggregated costs and benefits of antitrust enforcement for two countries are investigated further: the United States and the Netherlands. These two countries were basically chosen for two reasons. On the one hand, both countries are quite distinctive with respect to size: the United States had a GDP of about $12.970 billion in 2004 (at current prices), and the Netherlands had a GDP of about $629.900 million in 2004 (at current prices, see IMF World Economic Outlook 2004). On the other hand, both countries are quite distinctive with respect to their history of antitrust law: the United States enacted their first antitrust law in 1890, and the Netherlands did not reform their rudimentary competition law (from 1956) until January 1998 (see Konings et al., 2001: 845).

**Costs and benefits of antitrust enforcement in the United States**

On an aggregate level, some of the cost-side components of antitrust enforcement can be quantified relatively easily. The direct governmental costs in the United States are basically given by the budgets of the two enforcement agencies: the Federal Trade Commission (FTC) and the Antitrust Division (AD) of the US Department of Justice (DOJ). The FTC (2004) splits its 2005 budget into two fractions: 'consumer protection', with roughly $118 million, and 'maintaining competition', with roughly $87 million. Only the latter is interpreted as part of the governmental costs of antitrust enforcement. The Antitrust Division (2006) is solely working on 'maintaining competition' and had an annual budget in 2006 of roughly $139 million, leading to total governmental enforcement costs of about $226 million.

In addition to the direct governmental costs, firms also generate costs caused by antitrust enforcement. These can be subdivided into two fractions: 'costs by responding to government investigations' and 'costs of private antitrust litigation'. Baker (2003) estimates that the former cost block sums up to roughly $500 million annually. He derives this estimate by using an average value of an antitrust case of $2,5 million (covering filing fees, lawyers and economic consultants; see Global Competition Review, 2003, as well as Box 4 for comparable evidence from the *Airtours* case in the European Union) and multiplying it by the number of second-request cases (roughly 200) in 2002 in the United States. The estimate for private antitrust litigation is taken from Salop and White (1986), adjusted for inflation, and adds up to about $400 million annually. Overall, the direct costs of antitrust enforcement add up to about $1.126 million.[35]

[35] In a survey, PriceWaterhouseCoopers (2003) investigated whether the time and costs of business devoted to multi-jurisdictional merger reviews has the effect of a factual

**Box 4.** Legal and economic fees in *Airtours* case (1999)

Neven (2005: 10) discusses evidence on the relative importance of economic and legal fees gathered from the records of the *Airtours* case (1999). Airtours attempted to acquire First Choice; however, the European Commission banned the proposed acquisition. Nevertheless, Airtours succeeded in its appeal in the Court of First Instance (CFI). As a consequence, the Commission was ordered to pay the cost that Airtours had incurred in the procedure. These costs are shown in Table 3.

**Table 3.** Legal and economic fees in *Airtours* case (1999)

| | Claimed by AT | | Accepted by CFI | | |
|---|---|---|---|---|---|
| | In € | in % | in € | in % | in % of claimed |
| Barrister | 424.105 | 19% | 258.068 | 36% | 61% |
| Solicitors | 1.290.342 | 58% | 379.512 | 53% | 29% |
| Solicitors (expenses) | 29.616 | 1% | 0 | 0% | 0% |
| Economic consultancy | 426.650 | 19% | 45.541 | 6% | 11% |
| Academic economists | 51.440 | 2% | 29.579 | 4% | 58% |
| Legal fees in Luxembourg | 941 | 0% | 0 | 0% | 0% |
| Total | 2.223.094 | 100% | 712.702 | 100% | 32% |

Underlying £-€ exchange rate: 1,52 (1999 average).

As shown in Table 3, the fees claimed by Airtours add up to more than €2,2 million overall with about 80% of these fees referring to the work of lawyers and the remaining 20% to the work of economists. Interestingly, the Commission refused to pay the amounts Airtours requested, claiming that they were exaggerated. In the end, the CFI had to rule on the amount, and the Commission was ordered to repay about 32% of the costs claimed by Airtours.

In addition to the direct costs of antitrust enforcement, indirect costs, which are somewhat more difficult to delineate and estimate, must be taken into account. Baker (2003) considers the opportunity cost of management time devoted to antitrust compliance and litigation as well as any lost efficiencies if beneficial activi-

tax on mergers. The study finds that, although such a tax exists, it is on average clearly below 1% of the overall value of the merger deals. The study further finds that the typical multi-jurisdictional merger deal requires 8 completed or considered filings and generates on average €3,3 million in external merger review costs; 65% of these costs are legal fees, 19% are filing fees and 14% are fees for other advisers. The survey shows further that a few major deals with at least one in-depth review by an antitrust authority incurred costs of more than €10 million. Taking internal and external costs together, deals involving an in-depth review are eight to ten times more expensive than those subject only to an initial review (see PriceWaterhouseCoopers, 2003: 4f.).

ties are deterred by the prospect of antitrust enforcement[36] (see also Crandall and Winston, 2003: 5f.).[37] Baker (2003) assumes that the indirect costs are roughly equal to the direct costs, leading to total annual costs of antitrust enforcement in the United States of about $2.126 million (see Table 4).

**Table 4.** Direct and indirect costs of US antitrust enforcement

| | | million USD |
|---|---|---|
| DIRECT COSTS | | 1.126 |
| Direct governmental costs | Federal Trade Commission | 87 |
| | Antitrust Division | 139 |
| Direct private costs | Costs responding to government investigations | 500 |
| | Costs of private litigation | 400 |
| INDIRECT COSTS | | 1.000 |
| Opportunity costs of management time (Compliance and litigation) | | n.a. |
| Deterrence of beneficial activities by antitrust rules | | n.a. |
| OVERALL COSTS | | 2.126 |

Sources: FTC (2004); DOJ-AD (2005); Baker (2003); GCR (2003); Salop & White (1986).

On the benefits side of antitrust enforcement, the first quantification efforts were estimations of the sizes of the deadweight loss triangles discussed in section 2.2.1. Applying the basic equation for the deadweight loss (see Equation 1), it is

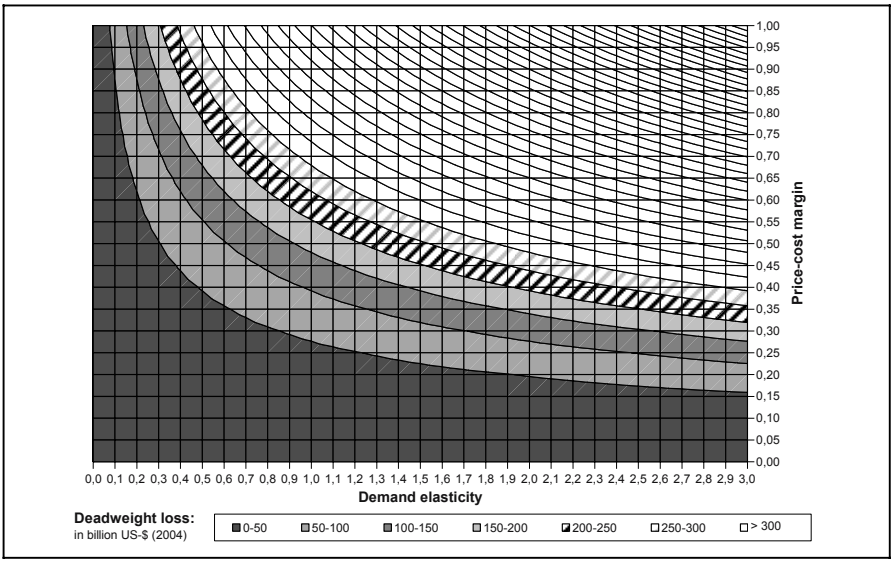
[36] Generally, the magnitude of especially the indirect costs of deterring beneficial activities by the design and enforcement of suboptimal antitrust rules is disputed among antitrust scholars. While some argue that Baker's estimate could be a realistic ballpark figure, others are of the opinion that these costs are substantially larger and typically dwarf any other costs of antitrust enforcement discussed above. I would like to thank Michael Waldman for pointing this out to me.

[37] Bittlingmayer and Hazlett (2000) analyse whether antitrust actions against Microsoft have created value in the computer industry. They hypothesise that a large number of computer firms which have products that are tied to the success of the allegedly monopolised Microsoft product (Disk Operating Systems) should prosper if actions are taken (by Microsoft or the DOJ) to make these operating systems costless, function better, or provide a more convenient platform for popular products. Policy actions that are expected to constrain Microsoft's market power effectively should simultaneously increase efficiency and improve profitability of firms throughout the sector. Bittlingmayer and Hazlett examine share price reactions for both Microsoft and a portfolio of 159 other computer firms around 54 antitrust enforcement announcements involving Microsoft over the seven years from 1991 to 1997. They find that antitrust action against Microsoft appears to inflict capital losses on the computer sector as a whole. Each enforcement action lowered Microsoft's stock by 1,2%, roughly $3 billion at May 1998 share prices. Furthermore, each enforcement action decreased a broad index of other computer stocks by 0,7%, equivalent to an additional loss of $5 billion in May 1998.

indeed straightforward to derive a first back-of-the-envelope estimate of the (potential) benefits of antitrust enforcement: Suppose that 10% of a country's national output is produced in monopolised industries, that the average price-cost margin is 0,2 and that the average market demand elasticity is 1,5 (see Leibenstein, 1966, and Rowley and Rathbone, 2004, for comparable calculations.) Using Equation (1) above then leads to a deadweight loss of 1,5% of the total GDP (see Annex 6.7 for a full table). Using the actual GDP figure for the United States in 2004 (about $12.970 billion), Figure 6 plots the corresponding deadweight losses for varying elasticities and price-cost margins.

As shown in Figure 6, with an average market demand elasticity of 1,5 and an average price-cost margin of 0,4, the corresponding deadweight loss lies in the range of $150-200 billion (the exact value is $156 billion as shown in Table 46 in Annex 6.7). Even with a substantially smaller price-cost margin of 0,1 and an average market demand elasticity of 1,0, the deadweight loss would still be around $6 billion and therefore about three times larger than the estimated costs of antitrust enforcement.

**Fig. 6.** Deadweight loss (in billion USD) against demand elasticity and price-cost margin (10% of US industry monopolised)




Although the benefits of antitrust enforcement shown in Figure 6 typically dwarf the generated costs, it is obvious that these estimates are very rough. In addition to the general criticism of deadweight loss studies (largely based on their assumptions and data-sets used; see section 2.2.1), Posner (2001: 17ff.) argues that neither of these studies can properly be used to measure the gains from having antitrust laws. "They measure the costs of monopoly given the existence of those laws, not the costs of monopoly that could be expected in the absence of

such laws. In a sense they measure the degree to which the antitrust rules have failed"[38].

An alternative way to measure the benefits of antitrust enforcement is to argue that antitrust interventions eventually lead to a decline in the price-cost margin. The benefits of antitrust policy can then be expressed by the deadweight loss differential between the before-enforcement and after-enforcement values of the (average) price-cost margin.[39] Figure 7 shows these differentials (i.e., the reductions in deadweight loss) for the United States (again based on 2004 GDP data) against the demand elasticity and the changes of the price-cost margin (in 0,1 steps).

As shown in Figure 7, a reduction in the price-cost margin from 0,4 to 0,3 at an average demand elasticity of 1,5 would lead to reductions in the deadweight loss in a range of $50-$75 billion (the exact value is $68 billion; see Table 47 in Annex 6.7). For a demand elasticity of 1,0, the reduction of the deadweight loss would still be in the range of $25-50 billion (the exact value is $45 billion; see Table 47 in Annex 6.7). In both cases, the benefits of antitrust enforcement still dwarf the cost estimate derived above.

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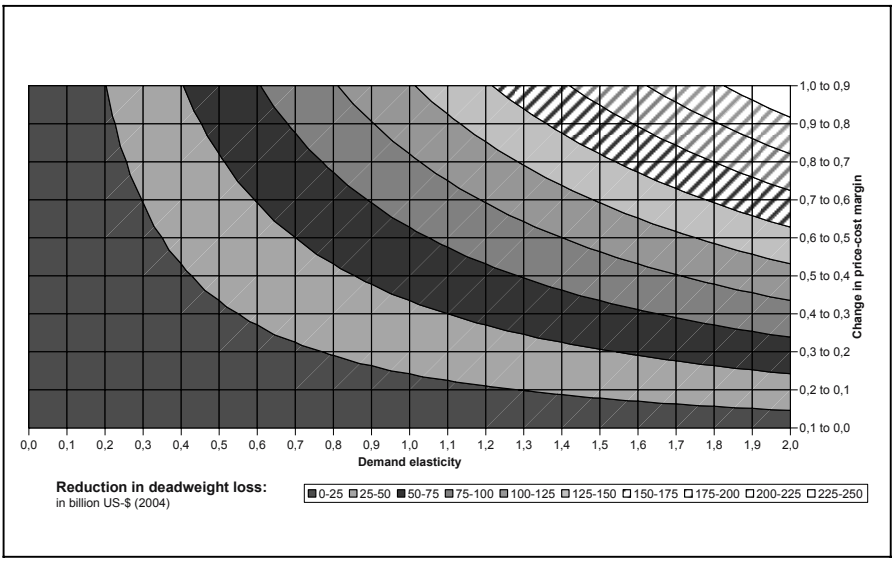
38 Baker (2003: 45) agrees with Posner's argument, adding, however, that such a "minimum estimate of the potential gains from additional antitrust enforcement provides a benchmark for assessing the benefits of current enforcement activity, under the plausible assumption that the efficiency gains achieved by preventing anticompetitive conduct – the deterrence benefits of antitrust – are at least as large as the potential gains from additional enforcement, which the Harberger framework measures".

39 In a recent paper, Boone (2006) argues why the price-cost margin is not a measure of success for competition policy for an antitrust authority that aims at maximising consumer welfare. Warzynski (2001) tests whether antitrust policy had an impact on the price-cost margins in the US manufacturing industry. His results indicate the presence of market power in many industries but also substantial heterogeneity of behaviour, across both time and industries. However, he concludes that price-cost margins were significantly lower when the antitrust policy was very tough. Konings et al. (2001) investigate the impact of competition policy on the level and the dynamics of firm price-cost margins in the Belgian and Dutch manufacturing industries. Belgium significantly strengthened their competition law in 1993, while the Netherlands followed a more lenient approach until the very end of the last century. The empirical results show that the reform of competition policy in Belgium did not have any significant effect on the price-cost margins in Belgium. However, a comparison between Belgium and the Netherlands revealed that price-cost margins in the Netherlands were significantly higher than those in Belgium. Additionally, Kee and Hoekman (2003) found for an international data set consisting of 28 industries in 42 developed and developing countries from 1981 to 1998 that the direct effect of antitrust law on industry price-cost margins is not significant for a sample consisting of all countries. However, the effect of antitrust law on industry price-cost margins increases with the size of the economy, indicating that antitrust policy may be more important for larger countries.

**Fig. 7.** Reduction in deadweight loss (in billion USD) against demand elasticity and changes in price-cost margin (10% of US industry monopolised)




In addition to the analysis so far, there are basically two major reasons why the true benefits of antitrust enforcement are substantially larger than stated so far: additional losses of monopoly and the deterrence effect of existing antitrust laws. With respect to the former, section 2.2.1 already showed that rent-seeking activities and productive inefficiencies can be interpreted as such additional losses of monopoly. If conservative estimates of these losses are also taken into account (DWL: 0,1%, RSA: 1,0%, PI: 1,0% of GDP) and applied to the GDP figure of $12.970 billion for the United States in the year 2004, the (potential) benefits of antitrust enforcement add up to roughly $272,4 billion ($13,0 billion DWL + $129,7 billion RSA + $129,7 billion PI).

The second argument which speaks for a too-low estimate (in Figure 6) is the deterrence effect of antitrust rules. *Deterrence* basically means that existing antitrust rules (and their enforcement) encourage firms not to behave in anticompetitive ways which would have lead to negative welfare effects in the absence of such rules. This 'encouragement' can be based either on a general attitude to respect the law and/or on the fear of antitrust investigations and fines. Although the existence of such a deterrence effect is beyond controversy, its quantification is surely a very challenging task.[40] Baker (2003: 40) and Geroski (2004: 8) simply

[40] At first sight, the results of Masson and Shannan (1984), presented in section 2.2.1, might answer this question. However, although Masson and Shannan estimate that the gains from competition are 8.7%, this value cannot be interpreted as a gain of antitrust policy, as even in the absence of any kind of antitrust law competition would likely prevail in many industries.

have the feeling that the deterrence effect very likely delivers more benefits alone than all the other benefits (discussed above) together.

In a nutshell, although several benefits and cost components are hard or almost impossible to estimate, it is likely that on an aggregate level for the United States, antitrust policy as a whole brings more benefits than costs to society.

**Costs and benefits of antitrust enforcement in the Netherlands**

In a study on behalf of the Dutch Ministry of Economic Affairs, Oxera (2004a; 2004b) develops a conceptual framework to assess the costs and benefits of market regulators (Oxera, 2004a) and applies it in the second part of the report to the respective institutions in the Netherlands.[41] The conceptual framework distinguishes between two possible counterfactuals to the present antitrust enforcement regime: 1.) no competition law and no Dutch competition authority (Nederlandse Mededingingsautoriteit, hereafter referred to as NMa) and 2.) private enforcement of competition law[42] and no NMa. While the first counterfactual would lead to an analysis of the costs and benefits of both competition law and competition policy, the second alternative would allow a comparison of the costs and benefits of having the NMa as an institution (see Oxera, 2004a: 7). Oxera concentrates their study on the latter counterfactual. Their (qualitative) results are summed up in Table 5.

As Table 5 shows, the cost side of antitrust enforcement by the NMa (compared to the counterfactual of private litigation under existing competition law) is structured into four sections: the direct costs of the running the NMa, the direct costs of the regulated firms, economic costs to the investigated markets (e.g., by making enforcement mistakes) and indirect regulatory costs created by regulatory uncertainty among firms. On the benefits side, Oxera identifies economic benefits to the markets in question (essentially by increasing allocative, productive and dynamic efficiency) as well as indirect regulatory benefits, such as deterrence effects of existing antitrust laws (and their enforcement).

Based on the arguments shown in Table 5, Oxera (2004b: 1ff.) continues in the second part of the report with the quantification of especially the cost part of their conceptual framework. The direct governmental costs are given by the budget of

41 The market regulators in the Netherlands are the Competition Authority (NMa), the Post and Telecommunications Authority (OPTA), the Financial Markets Authority (FMA), the Office of Energy Regulation (DTe), the Transport Chamber and the Healthcare Authority (NZa) (see Oxera, 2004a: 1).

42 *Private antitrust enforcement* basically means that existing competition laws are not enforced by an antitrust authority but rather through private litigation by especially competitors, suppliers and customers. In the United States, for instance, around 90% of all federal antitrust cases originate from private cases. See Jones (1999) and Oxera (2004a: 22ff.) for further discussions.

**Table 5.** Costs and benefits of the NMa against the counterfactual of private litigation under existing competition law

| Costs | Benefits |
|---|---|
| *Direct costs of the NMa*<br>– Total administrative costs of the NMa<br>– Minus administrative costs of the judiciary system dealing with private litigation | |
| *Direct costs of regulated firms*<br>– Total costs incurred by firms to comply with competition law and in relation to specific competition law proceedings<br>– Minus costs incurred in private litigation cases | |
| *Economic costs to the markets in question*<br>– Allocative, productive and dynamic inefficiency may result from unintended mistakes by NMa (e.g., excessive intervention or prohibition of efficient (and hence welfare-enhancing) practices)<br>– Minus any such costs caused by decisions of judiciary system | *Economic benefits to the markets in question*<br>– Allocative, productive and dynamic efficiency achieved through prevention of cartel and other anticompetitive behaviour that would not be challenged under private litigation<br>– Enhanced product/service quality and innovation achieved through promotion of a competitive market environment |
| *Indirect regulatory costs*<br>– Regulatory uncertainty among firms due to open-ended nature of competition law prohibitions (may be mitigated through clear guidance by the NMa and case law over time)<br>– Minus any such uncertainty caused under private litigation | *Indirect regulatory benefits*<br>– Active enforcement of prohibition in competition law has deterrent effects on cartels and other anticompetitive behaviour that would not be challenged under private litigation<br>– Active stance of the NMa contributes to overall government objective of achieving a competitive culture, away from previous 'cartel paradise' culture in the Dutch economy |

Source: Oxera (2004a: 28).

the NMa, which was about €22 million in 2003. In terms of administrative costs of firms in relation to Dutch competition law (e.g., filling in notification forms, dealing with information requests), Oxera uses a measure derived by a survey from the Dutch Ministry of Economic Affairs (MEA), which estimates these costs at €2,38 million per year (in 2002). However, these administrative costs are likely to underestimate the true costs for the firms, especially if in-depth analyses of

merger cases are considered. A survey by PriceWaterhouseCoopers (2003: 4) found that a typical multi-jurisdictional merger deal generates on average €3,3 million in external merger review costs. However, the survey shows further that a few major deals with at least one in-depth review by an antitrust authority incurred costs of more than €10 million.

Based on the PWC survey results, Oxera (2004b: 2) estimates the typical costs of a firm in a single EU jurisdiction. The internal costs of a first-stage merger were estimated to fall into a range of €20.000-€40.000 and €80.000-€120.000 for an in-depth merger review. In terms of external cost to firms, Oxera estimates a range from €110.000 to €160.000 for a first-stage merger and €600.000 to €900.000 for an in-depth merger review. Taking a subset of the average number of cases the NMa has dealt with in each year, the following rough approximation of the cost of firms due to antitrust enforcement can be obtained.

**Table 6.** Annual costs to firms due to a subset antitrust enforcement by the NMa

| Type of case | Number of cases dealt with by NMa (average p.a. over period 2001-03) | Estimated cost per case (€) | Total costs (€ million) |
|---|---|---|---|
| Notifications of agreements | 84 | 130.000 - 200.000 | 10,9 - 16,8 |
| Notifications of mergers | 95 | 130.000 - 200.000 | 12,4 - 19,0 |
| Reports based on reasonable suspicion of contravention of competition law (in-depth) | 9 | 680.000 - 1.120.000 | 6,1 - 10,1 |
| In-depth merger reviews | 2 | 680.000 - 1.120.000 | 1,4 – 2,2 |
| Total | | | 30,8 - 48,1 |

Source: Oxera (2004b: 2).

The estimates presented in Table 6 do not take costs of other proceedings (e.g., complaints or appeals) or general compliance costs incurred by firms into account. Overall, the costs of the private sector together with the direct governmental cost of about €22 million lead to a cost estimate between €52 million to €70 million (Oxera, 2004b: 22). Oxera undertakes no attempt to quantify the aggregate benefits of antitrust enforcement in the Netherlands; however, they estimate the welfare effects of three antitrust cases in more detail. One of these cases is presented in the discussion of the disaggregate level in the following section.

#### 2.2.3.2 Disaggregate Level

The analysis of the costs and benefits on an aggregate level basically give an indication that the sign of the net welfare effect of antitrust policy is likely to be positive. Although this is surely important information, it only presents half of the story, because it masks the partial contributions of the different areas of antitrust enforcement to the overall success of antitrust enforcement. In the words of Rowley and Rathbone (2004: 17),

> economists cannot confidently rely on deadweight cost arguments to justify on efficiency grounds a per-se policy of antitrust intervention … In principle, it is clear that a very detailed case-by-case study is required to determine whether or not specific instances of monopoly, whether induced by conspiracy, by merger or by internal expansion, is justified in terms of economic criteria.

It is beyond the scope of this section to try to derive or collect separate estimates for the contribution of every area of antitrust policy. However, what can be done is analysing single cases of antitrust enforcement and show whether their contribution to the benefits of antitrust enforcement alone was significant compared to the overall enforcement costs derived above. Geroski (2004) followed such an approach for selected cases in the United Kingdom and from his viewpoint as the chairman of the Competition Commission (who regularly has to justify the budgets for his authority). Following Geroski's approach, two case studies are presented in the Annexes 6.1 and 6.2: the *lysine* case*,* focusing on cartel enforcement in the United States, and the *Nuon-Reliant* case*,* focusing on merger enforcement in the Netherlands. Both case studies allow a quantification of the benefits of antitrust enforcement.

The quantitative results of the two case studies on cartels and mergers both show substantial contributions to the benefits of antitrust enforcement. In the US *lysine cartel* case, it is found that the overcharge (excluding the price war) adds up to about $113 million in total, which can be translated into an average overcharge of 22,82% of sales (in a range from 13,48% to 36,92%). The deadweight loss was assumed to be at 10% of the overcharge and therefore is about $11 million for the whole cartel period.[43] In the Dutch *Nuon-Reliant* merger case, the redistribution effect (per year) appears to be substantial across the board (between 5,57%, or about €280 million, and 11,72%, or about €612 million, of post-merger sales), while the deadweight losses are, because of the typically low demand elasticity in electricity markets, relatively small (between 0,60%, or about €1,7 million, and 1,36%, or about €8,2 million, of the redistribution effect). To a certain extent, the results of the two case studies confirm the results of the aggregate approach: The redistribution effects of increases in market power seem to be significantly larger

[43] One possibility to underpin this allegation is to argue that without successful cartel enforcement, the respective cartel would have continued to exist, causing welfare losses. In other words, the direct benefits of detecting a cartel can be approximated by the net present value of the yearly benefits in the future. See Annex 6.1 for a more detailed discussion on the occasion of the assessment of the customer losses caused by the lysine cartel in the United States.

than the actual deadweight loss – which is the primary aim of an efficiency-oriented competition policy.

An underpinning of this finding can be achieved by casting an eye on studies which try to aggregate the (costs and) benefits of cartel and merger enforcement. Connor and Helmers (2006), for instance, present a study in which they analysed a large dataset of 283 private international cartels that existed between 1990 and 2005. They provide estimates of the overcharges for all of these cartels for the United States, Canada, the European Union and other regions. Furthermore, they estimate that the deadweight loss adds between 10% and 30% of the overcharges to receive an estimate of the overall customer losses (see Connor and Helmers, 2006: 21). Using 10% as a defensive estimate of the deadweight loss and 30% as an aggressive estimate, it is possible to estimate the overall customer losses of 283 private international cartels between 1990 and 2005. The results are presented in Table 7 (see Tables 49 to 52 in Annex 6.7 for the full data tables and the spreadsheet calculations).

**Table 7.** Customer losses due to 283 cartels operating between 1990 and 2005

| | Overcharges | Defensive DWL estimate (10%) | Aggressive DWL estimate (30%) | Total customer losses (defensive estimate) |
|---|---|---|---|---|
| *Overall* | | *Million Real 2005 US Dollars* | | |
| United States | 54.001 | 5.400 | 16.200 | 59.402 |
| Canada | 975 | 97 | 292 | 1.072 |
| European Union | 99.459 | 9.946 | 29.838 | 109.405 |
| Other regions | 21.137 | 2.114 | 6.341 | 23.251 |
| All countries | 175.573 | 17.557 | 52.672 | 193.130 |
| *Yearly average* | | *Million Real 2005 US Dollars* | | |
| United States | 3.375 | 338 | 1.013 | 3.713 |
| Canada | 61 | 6 | 18 | 67 |
| European Union | 6.216 | 622 | 1.865 | 6.838 |
| Other regions | 1.321 | 132 | 396 | 1.453 |

Source: Calculations are based on data from Connor and Helmers (2006: 49ff.).

As shown in Table 7, aggregate cartel overcharges for the four regions add up to more than $175 billion for the period from 1990 to 2005. A defensive estimate of the deadweight loss of 10% of the overcharges adds almost $18 billion to the overall customer losses caused by these cartels of more than $193 billion. Focusing only on the data for the United States shows overcharges of $54 billion and a defensive estimate of the deadweight loss of $5,4 billion for the period from 1990 to 2005.

In terms of the overall benefits of merger enforcement in the United States, the Government Performance and Result Act requires agencies to monitor their performance. In order to meet these requirements, the FTC and the AD of the DOJ

quantify 'the dollar savings for consumers resulting from agencies' actions stopping anticompetitive merger activity' and 'non-merger activity' as part of their annual performance measures. For the fiscal year 2001, for instance, the FTC calculated consumer savings of $2,5 billion resulting from merger activities and further $157 million savings for consumers resulting from non-merger activities.[44] The DOJ reported to Congress that the AD merger enforcement efforts saved consumers at least $4,094 billion in the fiscal year 1998 and $2,551 billion in the fiscal year 1999 (see Nelson and Sun, 2001: 927).

In terms of methodology used to come to these estimates, both agencies use a consumer savings estimate constructed by multiplying an estimate of the price increase that would have occurred by the volume of commerce in the respective relevant market affected. For the derivation of the price increase estimates, two different approaches are used. For homogenous product markets the following formula derived from a standard Cournot model is used (see section 2.4.2.1 for a discussion and Annex 6.6.10 for the proof):

$$\frac{\Delta p}{p} = \frac{\Delta HHI}{\varepsilon_D^m - HHI_{postmerger}} \tag{7}$$

with *(Δp/p)* representing the percentage increase in price that would have resulted if the merger had been allowed to proceed, *ΔHHI* representing the change in the *HHI* that would have resulted and $HHI_{postmerger}$ representing the corresponding post-merger *HHI*. Following the example of Nelson and Sun (2001: 929f.), if an industry has 5 firms that each have a market share of 20% pre-merger and the market demand elasticity is equal to 1,0, a 2-firm merger would lead to an increase in the *HHI* of 0,08 and the equation above would therefore predict an 11,1% increase in price.

The second approach to estimate the price increase that would have resulted if the antitrust authorities had not stopped the merger is used for mergers which involve differentiated products. In such cases, merger simulations are run to estimate the percentage change in price. As explained by Nelson and Sun (2001: 931), the simulation models are based on the Bertrand assumption that a firm chooses a profit-maximising price assuming that competitors will maintain their current prices. For both approaches, Nelson and Sun extensively discuss the underlying assumptions and therefore the limitations of the significance of consumer savings figures which are derived by these techniques.[45]

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44 The values for FY 2002/FY 2003 were $726 million/$292 million (merger) and $86 million/$211 million (non-merger); see FTC (2006: 20). Starting with the fiscal year 2004, the FTC discontinued the savings measure and replaced it by an estimate of the dollar volume of commerce in markets in which FTC took action to prevent anticompetitive mergers and other competitive conduct (see FTC, 2006: 20).

45 For the homogenous goods approach the somewhat critical assumptions are: (1) all firms have constant marginal costs, (2) the merger does not change the cost structure of the firm, (3) the merger does not change the behaviour of the firms, (4) the post-merger market share of the firms is equal to the sum of their pre-merger market shares, (5) the elasticity of demand is constant over the relevant range of sales levels