Introduction

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Competition is a constitutive property of a market economy following immediately from the right of each individual to pursue his or her own interest. Therefore competition policy is a cornerstone of economic policy in a market economy. In fact, following the lead of US antitrust, most industrialized countries now have introduced some kind of competition policy. In particular, in the European Union competition policy has been accorded a constitutional status. As stated in Article 4 of the EC Treaty, the economic policy of the member states and the Community shall be conducted in 'accordance with the principle of an open market economy and free competition' and Article 3, lit g, says that competition must not be distorted, either by private restraints or by government interference.

In the history of ideas, competition as a salient feature of a free society can be traced back at least to John Locke (1690) who propounded that everybody has the unalienable right to pursue his or her own happiness. This idea gathered momentum from its propagation in the Bill of Rights of Virginia and the ensuing constitution of the United States of America. Given limited resources, the endeavor of countless individuals to improve their well-being by acquiring command over goods is necessarily conducive to competition. This idea found its way into legislation of the USA by the Sherman Act of 1890 which prohibits restraint of competition in most general terms.

This legislation originally found hardly any support among economists. It was only with the 1930s that economic theory began to furnish theoretical support for competition policy. Since then quite a lot has been accomplished in this direction. Today, in the USA antitrust has come to rely to a substantial degree on economic theory, and in the EC competition policy a 'more economic approach' has increasingly won ground. Hence modern competition policy rests on two pillars: on economic theory, in particular industrial economics, and legal reasoning.

This *Handbook* is intended to provide a scholarly review of the state of the art regarding principles of economic theory, empirical evidence and standards of legal evaluation in a way accessible to a wide audience. Therefore the following chapters focus on basic issues rather than on particular points which are of interest mainly for specialists in theory and legal practice.

This introduction should serve as a road map for understanding the role of competition in a market economy and clarifying the interrelation between the various chapters of the book. Readers interested in more theoretical details and a more comprehensive treatment of competition policy are referred to Martin (2001) and Neumann (2001), respectively.

Why competition and competition policy?

Unfettered competition of countless individuals is likely to give rise to warfare, as suggested by Hobbes (1588–1679) in his *Leviathan*, a struggle of everybody against everybody (*homo lupus hominem est*). This idea was echoed by Eddy (1912) who bluntly stated that 'competition is war, and war is hell'. He thus gave lively expression to the widespread belief that a market economy is characterized by chaos, unless peace is enforced by the government.

In fact, the notion of markets as being necessarily chaotic has been successfully refuted both by theory and by experience. Admittedly under somewhat restrictive and even unrealistic assumptions, for a market economy populated by individuals maximizing their utility, an equilibrium has been proved (by Debreu, 1959, and others) to exist where nobody can be made better off without somebody else being made worse off. Even though this proof had been accomplished under somewhat restrictive and unrealistic assumptions, experience suggests that a market economy, driven by individual interests, is far from being a Panglossian Utopia; rather it is a powerful machinery to create wealth for the great majority of people and potentially for everybody. The pursuit of individual interest encompasses the never-ending search for improving efficiency and probing new ideas and goods. In fact, competition is the most effective method of discovery (Hayek, 1968), by which in a market economy dispersed knowledge and expertise is brought to fruition. No central planning body would be able to be equally successful. This has most effectively been demonstrated by the breakdown of the central planning regimes favored by socialist countries.

The question then arises which kind of government intervention is required to avoid a Hobbesian chaotic struggle. Although the competitive process is likely to yield increasing wealth for the entire economy it also implies what Schumpeter (1942) called 'creative destruction'. Competitors of pioneering enterprises will be driven from the market because innovations make incumbent products and processes obsolete. Individual competitors are thus not immune from being adversely affected by creative destruction. This kind of adverse effect must be admitted in order to keep the competitive process going. Overall, however, it can be expected to work for the benefit of most people, as emphasized by Adam Smith ([1776] 1950, vol. I, p. 90).

> It is in the progressive state while the society is advancing to further acquisition rather than when it has acquired its full complement of riches, that the condition of the great body of the people seems to be happiest and the most comfortable.

On the other hand, from the viewpoint of ethics, limits on the pursuit of one's own happiness are required insofar as it must not deprive others of their freedom or impede their efforts to obtain it (J.S. Mill, 1861, p. 22). According to this principle the competitive process should be governed by fairness so that malicious intent to destroy competitors should be prohibited. The ethical principle enunciated by John Stuart Mill implies that competition policy should disallow restraints of competition rather than attempt to create competition which is deemed to enhance economic welfare as seen by the authorities. Hence the upshot of granting maximum freedom entails everything being allowed unless specifically forbidden, rather than prohibiting everything unless specifically allowed.

Pervasiveness of restraints of competition

Even though competition is the most effective way to improve the well-being of people in the long run, for an individual the absence of competition may, in the short run, be preferable. The most compelling reason for this preference is certainly that collusion among competing firms is conducive to profits exceeding those compatible with competition. However, given monopoly power, excessive profits are subject to being dissipated by rent seeking, so that profits no longer are the immediate incentive to create or maintain a monopoly. In a more extended perspective the most highly valued advantage of a monopoly seems to be a quiet life. This perspective has, on one hand, been given vivid expression by John Stuart Mill (1871, p. 748) who confessed that he

> was not charmed with the ideal of life held out by those who think that the normal state of human beings is that of struggling to get on; that the trampling, crushing, elbowing, and treading on each other's heels … are the most desirable lot of human kind.

The alluring prospect of a quiet life has given rise to widespread attempts to restrain competition. As observed by Adam Smith (1950, vol. I, p. 144), 'People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or some contrivance to raise prices.'

This observation for the time of Adam Smith has been amply corroborated by Ashton (1964) in his treatise on the history of the Industrial Revolution in England. The same story is told by the history of cartels in the USA before the advent of antitrust legislation towards the end of the 19th century, in

Germany prior to World War II (Neumann, 2001) and in England before the legislation prohibiting cartels in 1956 (Symeonidis, 2002). Even the prohibition of cartels in the USA and Europe has not been a panacea against the emergence of cartels in violation of the law, as recent spectacular cases like the international vitamin cartel and the cement cartel reveal.

Welfare loss attributable to monopoly

Evaluating the welfare loss caused by monopolistic market power has been a contentious issue. The welfare loss attributable to monopoly has usually been measured by the loss of consumer surplus which arises insofar as the price exceeds marginal costs (see Charles Rowley and Anne Rathbone, this volume). In the case of oligopoly the welfare loss can be approximated by one-half of profits of a representative firm of the industry (Cowling and Mueller, 1978). This static measure does not, however, tell the full story. If monopoly power results from a merger, a trade-off between monopoly power and efficiency may arise. Increasing size may help exploit economies of large scale so that marginal costs of the monopolistic firm may fall short of marginal costs of the previously existing firms absorbed by the merger. The price-raising effect of monopoly power which gives rise to a loss in consumer welfare, may be offset by the efficiency-enhancing scale effect which implies a gain in consumer surplus due to lower post-merger marginal costs. (Williamson, 1968; Rowley and Rathbone, this volume). On the other hand it must be taken into account that monopoly power may engender rent-seeking behavior which causes costs to increase. Monopoly power may, and most likely does, diminish incentives for innovation and thus inhibits economic growth. In the long run these adverse effects may dwarf any welfare gains entailed in static economies of large scale.

A first attempt undertaken by Harberger (1954) to quantify the static welfare loss of monopoly came up with disappointing results for those who assumed monopoly to be a social evil of substantial weight. Harberger suggested that the loss in consumer surplus attributable to a misallocation of resources due to monopoly power in US manufacturing from 1924 to 1928 was unlikely to exceed one-tenth of one per cent of value added. This result of course casts doubts on whether antitrust policy is worthwhile. However, on closer examination it became clear that the evaluation proposed by Harberger is flawed for at least two reasons. First, the underlying assumption that monopoly power does not affect costs of production is questionable even in a static environment. Second, it has to be taken into account that a monopoly is less likely than a competitive industry to enhance technical progress.

Regarding costs of production the crucial argument has already been advanced by Adam Smith ([1776] 1950), vol. II, p. 278) who observed,

> By a perpetual monopoly, all the other subjects of the state are taxed very absurdly in two different ways, first, by the high price of goods, which, in the case of free trade, they could buy much cheaper, and secondly, by their total exclusion from a branch of business, which it might be both convenient and profitable for many of them to carry on. It is for the most worthless of all purposes too that they are taxed in this manner. It is merely to enable the company to support negligence, profusion, and malversation of their own servants, whose disorderly conduct seldom allows the dividend of the company to exceed the ordinary rate of profit in trades which are altogether free, and very frequently makes it fall even a good deal short of that rate.

This argument has been amply elaborated by invoking the notions of X-inefficiency (Leibenstein, 1966) and rent-seeking (Tullock, 1967; Posner, 1975; Cowling and Mueller, 1978) which implies excessive costs. Assuming costs to be the same under competition and monopoly will thus cause a substantial understatement of the static welfare loss of monopoly.

With regard to dynamics, Arrow (1962) suggested that incentives for innovation are stronger under competition than in the case of monopoly. In particular, newcomers to an industry need not care about losses incurred by incumbents following technological obsolescence. This may explain why drastic innovations like the replacement of the mail-coach by railways or the mechanical calculator by the PC have been introduced, not by incumbents, but by new firms, which started small and rapidly grew large. It can likewise be shown even for non-drastic innovations that in an oligopoly the incentives to innovate increase with a rising number of competing firms (Neumann, 2001, p. 53). A further argument why innovations are impeded by monopoly power is contained in the statement of Adam Smith quoted above. He identifies the power of a monopoly with the power of the state to levy taxes which are subsequently wasted. There is ample evidence for taxation of this kind to inhibit economic growth (Neumann, 2001, p. 94). Hence monopoly power can be expected to exert an adverse effect on economic growth which dwarfs the static welfare loss. This provides strong support for the necessity of competition policy.

Limits of competition

The emergence of giant firms during the later decades of the 19th century gave rise to gloomy predictions regarding the viability of a competitive economy. Even though the predictions of Karl Marx and his followers of an ever-increasing concentration and the eventual demise of capitalism has not come true, horizontal concentration has undoubtedly increased and, following a succession of merger waves, the size of firms has increased. As has been pointed out by Sutton (1991), particular industries, iron and steel for example, in various countries display a similar degree of horizontal concentration. This suggests that concentration, to a large extent, is caused by technological factors and thus appears inevitable. On the other hand it must not be overlooked that in quite a few cases technological developments overturned tendencies which favored large size. Examples are the substitution of electrically powered machinery for engines powered by steam or the triumph of the PC over giant computers.

This mixed picture gives rise to the question to what extent economies of large scale do determine the size of firms and to what extent horizontal concentration must be attributed to this cause. Stephen Martin (in this volume) gives a comprehensive account of available empirical evidence and comes to the conclusion that economies of large scale are usually exhausted at quite a limited size, in most cases far below the actual size of big firms in the respective industry. In view of the evidence he argues that the greatest limitations to competition in global markets may lie in a political unwillingness to accept the resource allocations that are part and parcel of the benefits following from globalization.

In fact, globalization contributes to the viability of a competitive economy by mitigating the concentration effect of scale economies. A larger market can accommodate a larger number of firms which, given free entry into the industry, are at least able to just cover average costs where, in the example of a firm producing a single good the average cost curve is tangential to the declining individual demand curve. An increase in the size of the market may be conducive to an increase in the size of individual firms either by internal growth or by merger. Still, horizontal concentration need not increase; on the contrary, it is more likely to decrease. This applies even if a larger firm may employ a superior technique characterized by higher fixed costs and lower marginal costs (Neumann *et al.*, 2001).

Regardless of whether fixed costs do exist or not, free entry implies that, even though in the short run excess profits may arise, in the long run excess profits can be expected to be eroded.

Empirical studies in the tradition of the structure–conduct–performance paradigm have, despite some methodological problems, overwhelmingly documented that, first, price-cost margins (that is, price minus marginal costs over price) are positively associated with horizontal concentration of supply and, second, that the same applies to excess profits. These cross-section studies, regardless of whether they pertained to industries, lines of business or firms, left unanswered the question to what extent profits are persistent or subject to erosion by competition. In a series of studies, covering various countries, it has been shown that substantial erosion does in fact occur. However, it takes place only sluggishly. The competitive process thus works only imperfectly (Mueller, 1990).

Mergers and acquisitions

Mergers and acquisitions may be undertaken to reorganize industry structure in response to a changing environment and to utilize technological opportunities. From the viewpoint of an individual firm, acquiring another firm is just an investment undertaken to improve profitability. Higher profitability may be expected from raising efficiency in production by utilizing economies of scale or from product or process innovations. In the past mergers have occurred in waves corresponding closely to business cycles. So, at first sight, the interpretation of mergers and acquisitions as ordinary investment activity driven by the desire to enhance efficiency appears to have some merit. However, mergers and acquisitions may also, or alternatively, be undertaken to create or increase monopolistic market power. Both kinds of expectations may be mistaken and a merger may thus turn out as a failure.

In fact, using a novel methodology, Dennis Mueller (in this volume) demonstrates for a large international sample of merger cases that quite a few mergers actually improve efficiency. Nevertheless, a substantial share of mergers and acquisitions give rise to increased monopoly power. Finally, some mergers are simply failures from the viewpoint both of the firms involved and of the economy at large. In quantitative terms the results suggest that for every merger that yields an unambiguous increase in social welfare there are two that unambiguously reduce social welfare, divided roughly equally between mergers that lower efficiency and mergers that increase market power. Mueller suggests that these results imply that competition policy toward mergers should rest on a strong presumption *against* mergers to take place rather than a presumption in their favor.

Innovations

A closely connected aspect is whether innovations are more likely to be undertaken by small firms or by big ones. Regarding this question Schumpeter, in his *Theory of Economic Development* (1912) suggested that it is the newcomer, the pioneering entrepreneur, who is most likely to promote technical change. However, 30 years later, Schumpeter (1942) came to the conclusion that in modern times innovations are mostly coming from the laboratories of big firms. These hypotheses have given rise to a voluminous literature with respect to both theory and empirics. In particular the latter are comprehensively reviewed by David Audretsch (in this volume). The upshot is that both claims have some merit and that in particular small and medium-sized firms are responsible for a substantial share of innovative activity. Whilst until quite recently it was fashionable to agree with Chandler (1990) who concluded that 'to compete globally you have to be big', in view of overwhelming evidence to the contrary, scholarship has changed in its assessment of the role of small firms in the process of innovation and technological change, from being mostly unimportant to playing a central role.

International trade

The size of the market is larger and competition ordinarily more vigorous the more an economy is open to international trade. International trade is thus conducive to counteracting restraints of competition caused by a high concentration of supply in national industries or collusive practices. A review of the relevant literature is given by Eric Bond (in this volume).

In particular, tendencies for collusion are undermined by international trade. For collusion to be stable requires mutual trust. This condition is most likely to be satisfied in a closed society where 'people of the same trade meet for merriment and diversion', as put by Adam Smith and definitely less likely in an economy open to international trade. This general observation does not exclude the possibility of international cartels emerging and being maintained for an extended period of time. In fact, for West Germany it has been shown that imports exert an adverse effect on price-cost margins of firms in recessions but not in business cycle upswings (Neumann *et al*., 1983; 1985). So international trade is not a panacea for overcoming any restraints of competition originating in the domestic economy. This is particularly true since foreign trade policy in quite a few cases is used as a device to 'further national interest to the detriment of trading partners' by strategic trade policy (Brander and Spencer, 1985) or by permitting export cartels. In addition, domestic industries have frequently tried to ward off import competition by raising complaints about dumping and requesting the government to levy anti-dumping duties (Messerlin and Reed, 1995). Nieberling (1999) found for various US industries that adoption of anti-dumping measures led to an increase in monopolistic market power, as revealed by price-cost margins.

The failure of international trade to undermine domestic restraints of competition completely and to offset their results cannot exclusively be attributed to inadequate economic policy. One should remember that even Adam Smith, who otherwise ardently propagated free trade, gave clear priority to defense over opulence. In fact some restraints of international trade may be justified for reasons of national security. Therefore the burden of competition policy falls mainly on domestic policy.

Financial institutions

Competition is a fundamental economic mechanism to achieve efficiency and enhance consumer welfare. In the financial sector, however, competition may lead to inefficient and unwanted market outcomes, such as credit crunches or bank runs, because there is a tendency for market failures to arise from indivisibilities, externalities and informational problems.

The financial sector in both Europe and the USA has undergone a deep transformation process over the past decade. Deregulation and globalization have intensified competitive pressures on the incumbent players. New market players, such as insurance companies, credit card providers and non-financial companies, have been entering market segments which used to be banks' territories.

Increased competition may induce financial institutions to engage in riskier activities to make up for squeezed profits. Higher overall risk and lower profitability may then raise the probability and frequency of bank failures and thus trigger banking crises. Competition can thus be a threat to the stability of the financial system. Therefore the financial sector has traditionally been subject to regulation and supervision rather than to market forces and the watchful eye of competition authorities alone.

It has frequently been argued that firm size and the scope of activities matter in banking, that in particular a banking system with large and diversified banks may be better protected from instability. Therefore a lot of research has been devoted to examining the importance of scale and scope economies in banking. Arnoud Boot (in this volume) reviews the existing evidence. Boot judges the evidence to be 'sobering' and not really helpful in explaining the current wave of restructuring and consolidation in the financial sector. Rather he argues that strategic positioning resulting from first-mover advantages, learning and market power explain much better the patterns to be observed recently.

Principles of competition policy

Competition policy aims at establishing and maintaining a competitive order by seeking to support competitive structures in industry and to entice or even enforce competitive behavior. Given these aims, competition policy may be governed by two opposing views which may be termed constructivism and the evolutionary approach, respectively. Constructivism rests on the presumption that an optimal structure of industry can be derived from economic theory and implemented by government intervention. By contrast, adherents of the evolutionary approach deny that an optimum can be conceived of a priori and insist on competition itself being a process capable of yielding an outcome which may be found optimal only ex post. This view rests on admitting that, on logical grounds, innovations cannot be foreseen, an insight most forcefully expressed by Karl Popper (1957): 'we cannot anticipate today what we shall know only tomorrow'. Still, even though the specific outcome of the competitive process is unknown, economic theory is helpful in identifying circumstances under which a maximum of economic welfare can be expected to come forth. Competition policy in the spirit of the evolutionary approach therefore primarily focuses on setting rules to remove restraints of competition rather than devising structures which are deemed to be optimal.

In practice competition policy, as conducted in most industrialized countries, is governed by both views. Therefore antitrust is presumably the most politicized field of law. Terms like 'monopolize', 'market dominance', 'substantial lessening of competition' and so forth are not self-evident but need interpretation. Economics may and has been used to give them meaning. But antitrust is more than just economics. Law has its own claims and its own tradition (Bork, 1965, p. 780). Since competition law is thus open to interpretation, political interests are coming in. Charles K. Rowley and Anne Rathbone (in this volume) give an account of the political economy of antitrust. They examine to what extent political interest groups have been shaping thrust and vigor of competition policy in the United States. However, in order for a stable framework to be maintained, reliable rules of law, enforced by courts of justice, clearly deserve to be preferred to the vagaries of changing political majorities to determine the stance of competition policy.

Containing restraints on competition can be achieved by structural remedies or by regulation of economic behavior. It can also be done by setting rules or by discretionary decisions. To understand where these principles apply we shall look at some examples outlined in Table 1. The outstanding example of a structural remedy by rule is the per se prohibition of so-called 'hardcore' cartels as adopted in the USA. The same applies in practice in the European Union. Price fixing and collusive market sharing have come to be presumed as predominantly harmful. Efficiency enhancement which has frequently been claimed by cartels to be achievable have come to be considered as irrelevant for hardcore cartels. As stated most succinctly by the court in the 'Trenton Potteries Case' in the USA in 1927 (Neale, 1966, p. 36):

> The power to fix prices, whether reasonably exercised or not, involves power to control the market and to fix arbitrary and unreasonable prices. The reasonable price fixed today may through economic and business changes become the unreasonable price of tomorrow. Once established, it may be maintained unchanged because of the absence of competition.

In fact, a cartel leaves the legal autonomy of its members untouched and is thus a relatively loose arrangement which aims at balancing partially conflicting interests. Innovations adopted by an individual firm have the potential to upset the apple cart. Unless an innovation can be expected to yield an overwhelmingly large advantage for the innovating firm it may be withheld by the potential innovator in order to maintain the monopolistic advantage of the cartel. Therefore, in the case of hardcore cartels, the rejection of an efficiency defense appears to be well taken.

Table 1 *Rules or discretion*

	Rules	Discretion
Structural remedies	Per se prohibition of cartels	Substantial lessening of competition for mergers
Regulation	Predation	Natural monopolies

However, restraints of competition may be only ancillary to the main purpose of a horizontal or vertical cooperation among firms which aims at enhancing efficiency by joint R&D or exploiting synergies in production or distribution. Generally, albeit with some reservation, horizontal cooperation of this kind has come to be evaluated by applying a ‘rule of reason’ both in the USA and in the European Union. Cooperative agreements tend to be considered innocuous if the welfare-enhancing elements outweigh the restraints of competition.

The ‘rule of reason’ has in particular come to be applicable in the case of mergers. Most of them are presumably undertaken to improve efficiency, whilst restraints of competition are incidental and of minor weight. Whether this is true or whether restraints of competition are dominant must be examined case by case. Hence, as a structural remedy by discretion, a merger may be disallowed. In the USA, according to the Clayton Act, this applies if the effect of the merger ‘may be to substantially lessen competition or to create a monopoly’ and in the EC if a merger is conducive to creating or strengthening market dominance, meaning that the emerging firm is immune from substantial competition. These criteria, ‘substantial lessening competition’ and ‘acquiring market dominance’ are in practice almost equivalent.

Even so, both are subject to interpretation. Antitrust authorities and courts of justice so far have been inclined to find them satisfied if the merged entity is essentially immune from competition and the industry may be able to raise prices above marginal costs without being thwarted by competition. Obviously, a presumption of this kind to be justified is extremely hard to prove. Actually, the Court of First Instance in the EC recently turned down decisions of the EC Commission regarding mergers because of insufficient proof of market dominance under the above meaning. In fact, however, a ‘substantial lessening of competition’ (SLC) need not be identified with the likelihood of collusion regarding prices and market shares to arise. As argued by Marcel Canoy, Patrick Rey and Eric van Damme (in this volume), whether SLC applies should be interpreted in the light of the theory of oligopoly which implies that an increase in horizontal concentration yields the excess of the price over marginal costs to rise and thus to engender a monopoly welfare loss regardless of whether this tendency is reinforced by collusion. This applies both to markets for homogeneous goods and in the case of product differentiation. This hypothesis has found ample support by empirical studies in the USA as well as in Europe (Neumann, 2001, p. 78) Still, according to theory, the positive association between horizontal concentration of the industry and the ensuing welfare loss is largely continuous. Therefore some threshold of concentration must be fixed where competition is deemed to be lessened to such an extent as to justify disallowing a merger. Moreover, since market dominance following from high concentration of supply may be threatened by entry of new competitors, the degree of horizontal concentration alone is not sufficient to decide whether competition is likely to be sufficiently lessened.

Thus both criteria require an arbitrary decision as to when a merger is likely to lessen competition substantially. Merger guidelines in the USA and the Regulation regarding mergers in the EC which enumerate conditions with respect to market shares, concentration measures and an evaluation of the likelihood of competitive entry are rules at face value. They nevertheless bear some element of discretion and seem to be an outgrowth of a deliberate intervention in the market. Naturally, political value judgments are coming into play for designing merger policy.

The chapter by Canoy, Rey and van Damme also provides an extensive discussion from both an economic and a legal perspective regarding the prerequisites for and the consequences of abusing market power, such as predatory conduct and monopolistic exploitation.

A first and crucial step in determining the existence of market dominance is defining and delineating the relevant market. In principle, the relevant market comprises all those goods considered to be sufficiently close substitutes. Usually antitrust authorities have been inclined to use a narrow definition of the relevant market whilst industry interests would rather favor a broad definition. Paul Geroski and Rachel Griffith (in this volume) review the present state of the art and suggest invoking both demand and supply substitution simultaneously to delineate the relevant market. In particular, they reflect on the well-known SSNIP (Small but Significant Non-transitory Increase in Price) test used by US antitrust authorities to determine the boundary of the relevant market. Geroski and Griffith show that this test – although theoretically appealing – faces complications arising for intermediate markets, multi-market effects or endogenous technology changes, among others.

Since decisions regarding the admissibility of a merger are subject to a 'rule of reason' the merging firms may raise an efficiency defense to justify the merger. This amounts to investigating whether the consumer welfare loss following an increase in monopolistic market power can be expected to be offset by efficiency gains caused by the merger.

An example of regulation by rules is the handling of predatory conduct by requiring strict preconditions for predation to be recognized. For illegal predation to be assumed requires a twofold condition. First, the price must not cover costs and, second, initial losses must be likely to be subsequently compensated by higher prices (Cabral and Riordan, 1997).

Regulation by discretion applies to natural monopolies. A precondition for a natural monopoly to be identified is economies of large scale or, more generally, so-called 'subadditivity' of the cost function (Baumol *et al.*, 1982) for joint production, meaning that at any level of output costs are lower than costs which would arise if production were to be carried out separately. If, in addition, costs are sunk, government regulation of the natural monopoly is deemed to be called for either by ex ante regulation exercised by a regulatory authority or by ex post abuse control practiced by competition authorities. Christian Kirchner (in this volume) discusses the relationship between competition policy and government regulation. In the traditional view competition policy and regulation are non-competing instruments of government intervention. However, in certain situations, such as privatization of former state monopolies and deregulation of markets, competition policy and regulation can be competing in the sense that the goals to be achieved by the instruments are conflicting. Kirchner suggests a framework for identifying and resolving areas of conflict.

Extraterritorial effects and harmonization of competition policy

In an open economy restraints of competition exert effects across national borders. Cartels may comprise firms from different countries and mergers in one country may affect output and prices in other countries as well because the merging firms are exporting or even maintain affiliates abroad. Legal remedies and political problems arising in applying competition law across national borders is discussed by Jürgen Basedow (in the present volume). It is by now well established that restraints of competition arising in a foreign country insofar as they take effect in the domestic country can in general be prosecuted by domestic authorities ('effects doctrine'). Given the present globalization of economic activities it would of course be preferable if restraints of competition were treated all over the world following identical rules. Despite some steps taken in this direction under the auspices of the World Trade Organization (WTO) there is a long way to go to achieve this most desirable end. At the present time only US antitrust law and competition law of the EU have come closer so that some cooperation is feasible.

Social framework of competition policy

In concluding, a brief look at the social framework for competition seems to be in order. As competition policy is a constitutive part of economic and social policy it is subject to the impact of conflicting tendencies and interests. From the point of view of economics, the enhancement of efficiency appears to be the guiding principle. From a broader perspective, other objectives such as distributional justice and the maintenance of a decentralized economy as a safeguard of democracy or international rivalry, with the aim of occupying a leading position may come into play and influence the stance of the competition policy adopted. Still, for a free society, the overriding objective should be safeguarding economic freedom with limits as expounded by John Stuart Mill in his *Utilitarianism* (1861, p. 22). Following this principle industrial policy and in particular competition policy should guarantee a level playing field with equal chances for small and big firms alike. This implies in particular that distributional issues, such as supporting economic activities of particular groups of society to compensate for losses entailed by competitive pressures, should not be pursued by restraining competition but rather by helping them to compete effectively. Following this principle industries may, under certain conditions, be supported by subsidies from the government in order to stand up against foreign competition. Even though it is true that international trade flows are governed by comparative advantage, it has to be recognized that comparative advantage does not fall from heaven. To a substantial degree comparative advantages have been created by investing in private and public (both non-human and human) capital. Government subsidies to create and improve comparative advantages are thus legitimate unless they distort competition by favoring particular firms. Therefore, within the European Union, government aid is put under the surveillance of the Commission to maintain a level playing field. Beyond that the WTO should be called upon.

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