R

Raising Rivals' Costs

Naoufel Mzoughi[1] and Gilles Grolleau[2,3]
[1]INRA, UR 767 Ecodéveloppement, Avignon, France
[2]Supagro, UMR 1135 LAMETA, Montpellier, France
[3]Burgundy School of Business – LESSAC, Dijon, France

Abstract

We describe the different possibilities that a protagonist has to start a process to raise rival's costs (RRC). We present the general RRC mechanism and necessary conditions to make it successful. We also expose the strengths and weaknesses of RRC theory.

Synonyms

Non-price predation

Definition

It is a strategy aiming to increase the cost of an entity's competitors in order to disadvantage and even exclude them from the market.

Raising Rivals' Costs: How It Works!

The original cases that founded the raising rivals' cost (RRC) theory relate to famous monopolization cases faced by the US Federal Trade Commission (e.g., Alcoa, Dupont de Nemours, Kellogg, and Standard Oil) where firms interfere in input or upstream markets in ways that reduce rivals' profits. In most cases, the premise of the RRC theory goes as follows: the predatory firm increases their competitors' costs by developing exclusive relationships with strategic suppliers, such as input overbuying, naked exclusion – where the supplier is committed not to sell inputs to competitors – and controlling the whole supply chain in order to prevent rivals from accessing consumption markets (Granitz and Klein 1996; Carlton and Perloff 1998; Scheffman and Higgins 2003). It is worthy to notice that the RRC strategy differs from price predation, because to be profitable, it does not require initial investments that need to be recovered (Scheffman 1992).

In order to present the RRC mechanisms and main results, let us consider the following market structure (Salop and Scheffman 1983; Church and

Ware 2000): a dominant firm (or group of firms), denoted D, a group of fringe rivals, denoted F, and a perfectly elastic supply for D. The marginal (and average) cost for the dominant firm c_d is lower than the marginal cost of the fringe firms, but this firm cannot produce beyond a given quantity, q_d. Moreover, assume the marginal (and average) costs for the fringe of competitive firms, denoted c_f, to be constant, but without any production constraint. The equilibrium price and quantity, respectively, denoted c_f and q^*, are presented in Fig. 1.

At equilibrium, the dominant firm is considered as inframarginal since its price is above average cost, despite a competitive market, which allows it benefiting from inframarginal rents. Now assume that the dominant firm is able to increase the costs incurred by the fringe rivals. The equilibrium price will increase proportionally to the increase of the marginal cost of the fringe. However, the quantity produced by D will not change, while the quantity produced by F will decrease. In addition, assume that this cost is equally distributed across production units. The change in net profits of D can be written as $\Delta\pi_d^n = (\Delta c_f - \Delta c_d)q_d$. Hence, the profit of D increases if $\Delta c_f > \Delta c_d$. A sufficient condition for a profitable RRC strategy is that it increases the marginal cost of the fringe relatively more than it does for the dominant firm. Indeed, only an increase of the marginal cost of F leads to an increase of the equilibrium price. Consequently, any producer for which an increase of the market price is beyond the increase of its average cost will benefit from a RRC strategy. Moreover, two other basic results (Scheffman 1992; Church and Ware 2000) can also be mentioned. First, an attempt to increase the dominant firm's costs does not influence the equilibrium price, although it can influence the profit of D. In other words, there is no strategic effect because the situation of F is not affected. Second, the demand has to be sufficiently inelastic in order to guarantee the profitability of the RRC strategy. Indeed, if the demand is highly elastic, the price will not increase despite a marginal cost increase of F. The fringe producers will rather exit the market.

Based on the seminal works of Director and Levi (1956), Nelson (1957), Williamson (1968), and Salop and Scheffman (1983), scholars examined the relevance of RRC strategies in various domains such as free trade agreements (Depken and Ford 1999), advertising, lobbying for product and/or environmental-related standards (Hilke and Nelson 1984; Grolleau et al. 2007), agrofood systems (Barjolle and Jeanneaux 2012), pollution regulation (Sartzetakis 1997; Lyon 2003), and stock exchange (Harris et al. 2014). In general, these studies provide, explicitly or not, evidence to the relevance of using the RRC theory in analyzing specific organizations of the considered markets. Moreover, Normann (2011) recently provided experimental evidence in favor of the

Raising Rivals' Costs, Fig. 1 Raising the costs of a competitive fringe (Inspired from Church and Ware 2000, 629)
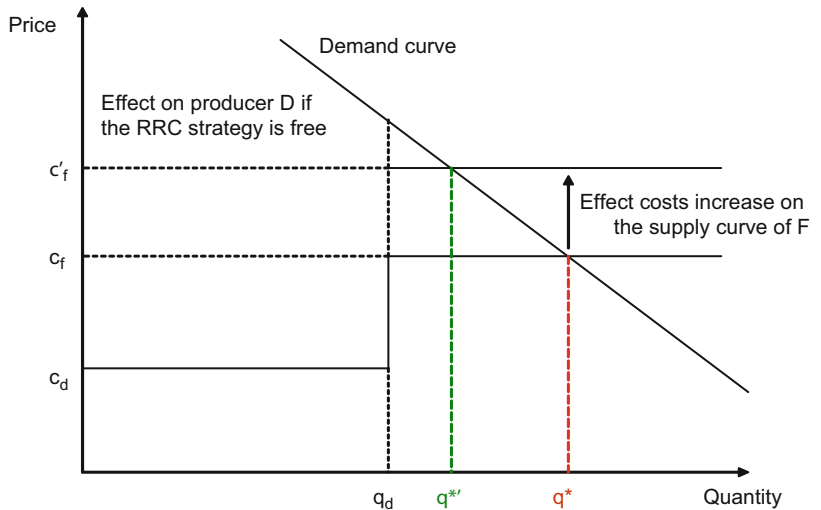
hypothesis that vertically integrated firms have an incentive to foreclose the input market to raise its downstream rivals' costs. Nevertheless, several scholars developed arguments against the RRC theory, in particular regarding its "real" potential to analyze antitrust cases (e.g., Lopatka and Godek 1992; Coate and Kleit 1994). (Given the large literature, we only provide a general overview of the arguments against the RRC theory, without purporting to be exhaustive.) For instance, the RRC theory is often analyzed through its vertical aspects and consequently its contribution to the existing competition analyses can be considered rather weak (Brennan 1986). Indeed, a RRC strategy requires that the predator is assumed to look for a monopoly on a relevant input market, which makes it a particular case of preceding competition analyses. Similarly, Church and Ware (2000) argue that some RRC cases can be also analyzed through the lenses of other theories. Moreover, the required conditions for RRC strategies are so constraining that it turns unlikely to have a significant anti-competitive effects (Coate and Kleit 1994). In addition, the costs of excluding rivals could be also higher than the derived benefits. Furthermore, Boudreaux (1990) points out the fact that the RRC theory does not take into account competitors' counter-strategies. Interestingly, while S. Salop and D. Scheffman developed the RRC theory, they admit that their works have some limits mainly encompassing the following concerns:

1. The theoretical ambiguity of the RRC effects, especially because a RRC situation does not necessarily correspond to an anti-competitive behavior
2. The lack of a framework allowing to distinguish intentional RRC strategies and other types of competition that also alter rivals' situation
3. The focus on particular market structures that may not reflect real-world settings
4. The lack of an analysis regarding the whole effects in terms of well-being (Salop and Scheffman 1987; Scheffman and Higgins 2003)

Conclusion

We presented a general description of the RRC theory. We pointed out the necessary conditions for a profitable RRC strategy and the effects of its implementation, although such effects are often ambiguous. We believe that RRC theory offers promising insights in domains that were not initially considered or extensively studied such as environmental regulation or standards. RRC strategies are sometimes difficult to detect and can be justified by other issues such as environmental conservation or public health. Interestingly, these issues can also lead to "strange" coalitions, such as the one between Baptists and bootleggers described by Yandle (1983). Hence, given the multidimensional nature of RRC, the net welfare effect can remain ambiguous and makes it difficult to craft adequate remedies. Such a result can be discouraging for antitrust authorities.

References

Barjolle D, Jeanneaux P (2012) Raising rivals' costs strategy and localised agro-food systems in Europe. Int J Food Sys Dyn 3(1):11–21

Boudreaux D (1990) Turning back the antitrust clock: nonprice predation in theory and practice. Regulation 45–52

Brennan T (1986) Understanding raising rivals' costs. Antitrust Bull 33:95–113

Carlton D, Perloff J (1998) Modern industrial organization. Addison Wesley Longman, New York

Church J, Ware R (2000) Industrial organization: a strategic approach. McGraw-Hill, Boston

Coate M, Kleit A (1994) Exclusion, collusion, or confusion? The underpinnings of raising rivals' costs. Res Law Econ 16:73–93

Depken G, Ford J (1999) NAFTA as a means of raising rivals' costs. Rev Ind Organ 15(2):103–113

Director A, Levi E (1956) Law and the future: trade regulation. Northwest Univ Law Rev 51:281–296

Granitz E, Klein B (1996) Monopolization by "raising rivals' costs": the standard oil case. J Law Econ 39:1–47

Grolleau G, Ibanez L, Mzoughi N (2007) Industrialists hand in hand with environmentalists: how eco-labeling schemes can help firms to raise rivals' costs. Eur J Law Econ 24(3):215–236

Harris F, Hyde A, Wood R (2014) The Persistence of dominant-firm market share: raising rivals' cost on the New York Stock Exchange. South Econ J 81(1): 91–112

R

Hilke J, Nelson P (1984) Noisy advertising and the preda-
    tion rule in antitrust analysis. Am Econ Rev
    74(2):367–371
Lopatka J, Godek P (1992) Another look at ALCOA:
    raising rivals' costs does not improve the view. J Law
    Eco 35:311–329
Lyon T (2003) "Green" firms bearing gifts. Regulation
    4:36–40
Nelson R (1957) Increased rents from increased costs: a
    paradox of value theory. J Polit Econ 65:287–294
Normann H (2011) Vertical mergers, foreclosure and rais-
    ing rivals' costs – Experimental evidence. J Ind Econ
    59(3):506–527
Salop S, Scheffman D (1983) Raising rivals' costs. Am
    Econ Rev 73:267–271
Salop S, Scheffman D (1987) Cost-raising strategies. J Ind
    Econ 1:19–34
Sartzetakis E (1997) Raising rivals' costs strategies via
    emission permits markets. Res Law Econ 12:751–765
Scheffman D (1992) The application of raising rivals' costs
    theory to antitrust. Antitrust Bull 37:187–206
Scheffman D, Higgins R (2003) 20 years of raising rivals'
    costs: history, assessment, and future. George Mason
    Law Rev 12(2):371–387
Williamson O (1968) Wage rates as a barrier to entry: the
    Pennington case. Q J Econ 82:85–117
Yandle B (1983) Bootleggers and Baptists: the education
    of a regulatory economist. Regulation 7(3):12–16

Ransom Kidnapping

Marco Vannini[1], Claudio Detotto[2] and
Bryan McCannon[3]
[1]Department of Economics and CRENoS,
University of Sassari, Sassari, Italy
[2]DiSea – CRENoS, University of Sassari, Sassari,
Sardinia, Italy
[3]Saint Bonaventure University, St Bonaventure,
NY, USA

Abstract

The practice of kidnapping for ransom, a pred-
atory crime carried out mostly by criminal
organizations, is a salient phenomenon in
many regions of the world. It causes serious
harm not only to victims and their families but
also to private and social capital. As a paradig-
matic rational crime involving negotiations,
the incentives to commit the crime and the
way it ends change with the probability and

severity of punishment, the kidnapper's will-
ingness to kill the hostage, and the value of the
hostage life from the point of view of the
family. Limiting the family's ability to pay
reduces the frequency of the offense but
opens the possibility of unintended conse-
quences in terms of fatalities and duration of
abduction.

Definition

Kidnapping in its widest sense occurs when a
person carries away another person by force or
fraud with the intent to exploit the abduction for a
variety of purposes. Ransom kidnapping refers to
a situation in which the overriding purpose for the
act is a payment (usually a sum of money) for
the release of the hostage and the enrichment of
the perpetrators. It is a serious crime causing not
only economic losses but also pain and suffering,
often in the form of post-traumatic stress disorder
(PTSD) and major depression (MDD), to the vic-
tims and their families. Occasionally it ends in
death.

Introduction

Kidnapping for ransom, also referred to as eco-
nomic kidnapping or profit kidnapping, is a pred-
atory crime carried out mostly by criminal
organizations, rather than single offenders, usu-
ally after careful planning of the various stages of
the (illegal) production process. The latter, in per-
fect business style, begins with a market analysis
designed to identify the most profitable opportu-
nities and to evaluate the benefits and costs of the
different options in light of the strengths and
weaknesses of the organization. Specialized
gang members/units are required for carrying out
the activity: e.g., for targeting victims (so-called
spotters), holding the hostage (a tricky task often
performed by someone difficult to track, like an
absconder), communicating with the parties
involved (media, families, police, negotiators:
both formally and through the grapevine), provid-
ing food to hostages and guardians, and collecting

and cleaning the ransom (be it hard cash or any other resource with financial and/or social value). Depending on the nature of the criminal partnership and its specific market segment (see below), the production chain may include reinvestment of the proceeds in higher-value illegal markets, like the international drug industry, and/or further actions designed to secure a dominant position for the parent organization both in the underworld and the upperworld (as in the case of mafia-type or terror-affiliated groups).

Despite the relative complexity of the structures and tasks capable of sustaining a successful ransom kidnapping business, this type of crime is seldom classified as *organized crime*. The distinction between (even highly organized) ordinary illegal firms and organized crime, which may be relevant for the criminal justice system responses to the problem (see Garoupa 2007), is still controversial among both scholars and practitioners (see the digital collection by Klaus von Lampe www. organized-crime.de/organizedcrimedefinitions.htm; Varese 2010). Clearly, neither the earlier descriptive definition by Donald Cressey (1969) of organized crime as an entity "rationally designed to maximize profits by performing illegal services and providing legally forbidden products demanded by the members of the broader society" nor the insightful characterization by Thomas Schelling (1971) of organized crime as the underworld counterpart of monopoly and not just organized business mirrors the multifaceted phenomenon of ransom kidnapping across time and places. However, reversing the perspective and looking with Schelling at the factors that make an illegal activity a prime target for organized crime (basically victimized criminals should have no ready access to the law, they must find it difficult to hide from the "protector" and to carry away their business in an attempt to escape, and their earnings must be easily monitored and flow smoothly and regularly), it may be argued that an appropriative activity like ransom kidnapping does not lend itself to be monopolized. Moreover, being based on a relatively simple technology with generally modest overhead costs, the requirements for a large-scale firm are hardly met. Alternatively, adopting Williamson's

(1985) view that organizational variety arises primarily in the service of transaction cost economizing, the activities of organized criminal firms "will be guided primarily by the relative costs of completing illegal transactions within the market versus within a downstream firm" (Dick 1995).

While the debate on the nature of organized crime (Peltzman and Fiorentini 1995) goes on, the evidence gathered so far on ransom kidnapping and organized crime worldwide shows very different patterns within and between countries. In Italy, for instance, ransom kidnapping has been a key source of liquidity, to be invested in real estate development and in the drug business, for both the 'Ndrangheta and the Sicilian Mafia since the early 1960s. By contrast, the rural gangs of Sardinia that dominated the kidnapping business in the country for two decades (late 1950s through the 1970s) never tied to or behaved as classic organized crime. Likewise, within the top seven Mexican trafficking organizations, only the Zetas and the Beltran Leyva indulged in kidnapping (Astorga 2012); with the crackdown on drugs, however, many former criminal members of all such cartels found it profitable to switch to organized kidnapping (a similar pattern has recently emerged in Kenya and Somalia as a result of the amplified efforts to crack down on piracy). In Nigeria, where the kidnapping business emerged in the 1990s, this type of crime is associated with wealth-oriented secret societies, untouchable secret sorcery society, and "419" fraud syndicates (Ebbe 2012). Finally, as reported in Levitt and Rubio (2000), a strong causal link between kidnapping and the scope of guerrilla activities has been found in Colombia over the 1990s.

In recent years, against the backdrop of rapid globalization and increased pervasiveness of ICT (information and communications technology), kidnap and ransom has become a billion-dollar industry in which major changes have taken place. Next to classic ransom kidnapping, new categories have flourished, with peculiar traits that deserve attention for both credible research and improved enforcement.

Insider kidnapping: criminals buy inside help from employees of target companies/resorts

to access key information for the abduction to take place.

Express kidnapping: abductions have minimum duration (typically less than a day) and are calibrated in order to extract maximum cash withdrawal from ATM, for example, using the victim's payment instruments or to get a quick ransom from his/her family or company.

Tiger kidnapping: one or more individuals are abducted to coerce another person to commit a crime – which can be anything from robbery, extraction of a ransom, to murder – for the benefit of the kidnappers.

Terrorist kidnapping: motivated by financial and political reasons, it operates in politically unstable countries exploiting both domestic and international networks to carry out the abduction and to launder the ransom; it involves mainly foreign victims – often from profiled nationalities – and although the demands may start out politically motivated, they may transition to financial benefits as the negotiations progress.

Piracy for ransom: incidents take place in maritime zones in which the right of State sovereignty do not apply and comprise both physical capture of cargo from a vessel and demanding a ransom in exchange for the vessel, crew, and cargo; it represents a multi-jurisdictional challenge whose escalating figures, concerning both frequency of attacks and average ransom payments, are posing serious threats to the financial, insurance, and shipping system.

Virtual kidnapping: the supposed victim is lured or forced into a place in which it is impossible or difficult to communicate or be contacted, at the same time a family member receives calls by someone who claim to have kidnapped their loved one and demand a ransom to freed the hostage.

The global kidnapping epidemic has brought close cooperation between jurisdictions, as well as effective implementation by the largest number of countries of international standards and preventing measures against money laundering, terrorist financing, and corruption, to the forefront. In the transnational setting, however, the differing public good aspects of defensive and proactive measures magnify the risk of collective action failures when implementing such policies, with potential oversupply of the former and undersupply of the latter (Enders and Sandler 2005).

In order to gain a deeper understanding of the kidnapping for ransom phenomenon and its control, the rest of this entry will review three related aspects: the incidence of modern-day ransom kidnapping around the world, the theoretical framework providing insights into the strategic problems faced by the kidnapper and by the hostage's family, and the lessons from applied studies of kidnapping on two selected policy issues: assets freezing and marginal deterrence.

Modern-Day Ransom Kidnapping

Whereas the practice of kidnapping is as old as recorded history and is mentioned in ancient texts from all over the world, kidnap for ransom as the crime is understood today is a relatively recent phenomenon. According to Wright (2009), it was in the late nineteenth and early twentieth centuries that legislation defining the crime and prescribing harsh punishments for the perpetrators was formally adopted for the first time in many places. In the USA, for instance, seven states passed their first anti-kidnapping laws, and 18 others stiffened penalties, in the first two decades of the twenty-first century. The Federal Kidnapping Act was passed in 1932 after the son of the America's hero Charles Lindbergh was kidnapped and killed. By that time many European countries with different legal traditions had already implemented their laws, although new provisions and amendments have continued until recently in order to catch up with the evolving nature of the crime and the surge of hostage taking by terrorists.

Despite efforts by UNODC (United Nations Office on Drugs and Crime) to collect comparative data on recorded crime in member states, the available information is still heterogeneous in many dimensions (definition of crimes, periodicity, details, and so on) and does not provide a reliable basis for cross-country analysis. Both scholars and practitioners have to rely on a mix

of sources, like extracted information from newspaper accounts, historical reconstructions, and official statistics when ransom kidnapping as a separate offense category among the index crimes is available. It is well known that since its modern-day inception, ransom kidnapping flourished in the first half of the twentieth century in the USA and in the second half in Italy. Studying the *New York Times* files on kidnapping incidents, Alix (1978) reports 1,703 cases of kidnapping occurring almost entirely in the USA between 1874 and 1974 (about 1.7 per year), including 236 classic kidnappings for ransom. The crime reached its peak in the 1930s, disappeared during the next 40 years, and reappeared dramatically in the 1970s when it became a politically motivated symbolic act of power. Yet, compared to criminal homicides (with about 7,000 cases in each of the years 1924–1974), the contribution of ransom kidnapping to total crime was modest.

By contrast, kidnapping for ransom in Italy in the period 1960–2000, with 592 cases and an average of 14.4 abductions per year, had a dramatic impact and placed the country at the top of the worldwide kidnapping hot spots throughout the 1970s and most of the 1980s (Wright 2009). Failed attempts are excluded from this count, which is based primarily on a unique archive by the former law enforcement official Luigi Casalunga (2013). Exploring the dataset, the frequency of kidnappings spiked in the late 1970s (73 incidents in a single year), continued at remarkable levels through the mid-1980s, and then slowly declined in the following decades.

In this scenario, the island of Sardinia played a special role. As documented in Marongiu and Clarke (2004), the island – despite being an organized crime-free region – had a long-standing tradition on kidnapping dating back to more than 500 years. In the time span 1960–2013, around 27% of Italy's ransom kidnappings took place in Sardinia, resulting in 162 incidents against 118 in Lombardy and 96 in Calabria: 10.6 cases per 100,000 residents, i.e., ten times the national rate. In those years, Sardinian bandits were global players and spread the crime all over Italy. They were responsible for 39 out of 40 incidents in the 1960s, 62 over 258 in the 1970s, and 39 over

249 in the 1980s. To the kidnap epidemic contributed also gangs associated with organized crime from Calabria ('Ndrangheta) and Sicily (Mafia). While the former, having found a congenial operating habitat out of the Aspromonte, ran the business until recent times, the latter withdrew pretty soon for fear of additional police controls and negative reputational effects brought about by such heinous crime.

Nowadays, in many areas of the world, kidnapping is a flourishing criminal industry, with wide direct and indirect impacts on victims and society at large. According to the Control Risks Group, an international risk consultancy, at the turn of the century economic kidnappers globally would take home well over $500 million each year. Countries involved include Colombia, Mexico, Brazil, Philippines, and Venezuela. In Colombia, where the fraction of kidnappings of firm managers and firm owners were just under 10%, it is calculated that this type of kidnapping has a statistically significant negative relationship with corporate investment (see Pshiva and Suarez 2010). In the last decade, however, the kidnapping activity has declined both in Colombia, where the annual reported kidnapping incidents went from about 3,500 cases in the year 2000 to "only" 282 10 years later (Fink and Pingle 2014), and in the rest of Latin America. Meanwhile, kidnap numbers have soared in Nigeria, India, Lebanon, Iraq, and Afghanistan, while Mexico confirms its primacy with the highest number of kidnaps for ransom recorded worldwide (roughly 2,000 cases in 2010). According to *Alto al Secuestro*, a foundation that assists victims in Mexico, between December 2012 and February 2014, there were 4,051 kidnapping victims nationwide, of which 2,922 had been freed, while 1,129 were still being held. As the very affluent targets are adopting effective defensive measures, kidnappers are increasingly switching to middle-class workers, small business owners, students, and mid-level professionals, which now make up about 70% of the total victims.

As a matter of fact, Latin America has lost its leadership in favor of African and Asian countries, which represent the new frontier for this typology of criminal activity. In 2004 about 55%

R

of the world's recorded kidnaps for ransom were in Latin America, while in 2012 the region accounted for only a quarter of the incidents, and Asia and Africa made up slightly less than 75% (with about 50% for Asia excluding the former USSR and with 22% for Africa).

Deeper international economic integration, greater political instability (e.g., in the former Soviet Republics and in the Middle East area), and growing interest by international tourists for adventure holidays have created new opportunities and brought about new potential victims for profitable kidnapping. In fact, it is no coincidence that kidnappings of foreign nationals globally have increased by 275% over the 2000s (Kassim and Mohamed 2008). Furthermore, since 2005, the Horn of Africa, particularly the Gulf of Aden (Somalia) and Arabic Sea, has risen to prominence as a new hotspot for maritime piracy, particularly kidnappings for ransom.

At present, ransom kidnapping is a thriving industry in developing regions, while it has virtually disappeared in North America and Europe, which together represent only about 1–3% of global activities. This polarization can be even more extreme in light of the under-reporting and under-recording biases of the official crime data, which are presumably more serious in the former countries.

## Interactions Between the Kidnapper and the Victim's Family

In 1976, scholars and practitioners from all horizons of game theory, physics, psychiatry, and behavioral sciences and from private and public institutions gathered in Santa Margherita, Italy, for a seminar on the control and prevention of hostage taking organized by the Institute of Criminal Justice and Criminology of the University of Montreal in cooperation with the International Centre for Comparative Criminology of the University of Maryland (Crelisten and Laberge-Altmejd 1976). On that occasion, Reinhard Selten (1976) presented a two-person game model to gain insight into the strategic problem faced by the kidnapper (K) and the hostage's family (F). Nowadays, versions of the model feature in microeconomics textbooks to illustrate the structure of dynamic games and the notion of subgame perfection (Harrington 2014). Yet, it still represents the basic theoretical reference for the analysis of hostage-taking events. The extensive form of this game is represented in Fig. 1.

At the top of the decision tree, agent K makes the first move deciding whether to kidnap the victim or not. If he chooses the latter, the game ends with zero payoffs. If, instead, he chooses to kidnap the target, he announces a ransom D. Then, the victim's family F either accepts the demand from K or makes an alternative offer C. In both cases, in turn, the kidnapper will decide to release or kill the hostage.

If the family accepts the ransom requested ($C = D$), the criminal will rationally decide to release or kill the victim according to the expected payoffs V_R and V_K. If the family offers an unsatisfactory amount ($C < D$), then the kidnapper could feel offended and frustrated at the low offer and might react killing the hostage.

Ransom Kidnapping,
Fig. 1 The extensive form of the game
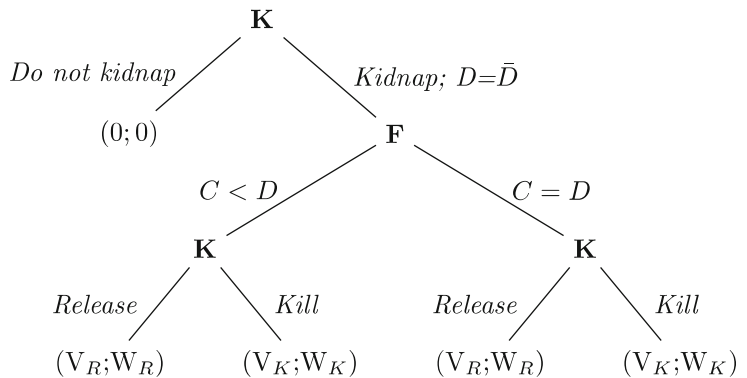
It is assumed that the probability associated to this extreme reaction is equal to α, which is a function of the distance between the amount offered (C) and the amount requested (D):

$$\alpha = a(1 - C/D) \qquad (1)$$

where a is a parameter ranging between 0 and 1, which measures the kidnapper's propensity to sanction noncompliant offers. As one can see, the higher the $C - D$ gap, the higher the value of α; when $C = D$, the likelihood of this sanction equals zero.

The subgame-perfect equilibria of the game shown in Fig. 1 can be investigated by backward induction. Starting at the game's final decision nodes and analyzing player K's choice, we see that he prefers to release the hostage if (and only if) the following relation holds:

$$V_R > V_K \qquad (2)$$

where

$$V_R = (1 - q)C - qx \text{ and } V_K = -y - qz. \quad (3)$$

Briefly, V_R and V_K represent the kidnapper's expected gain in the two regimes (release or kill), where (q) is the probability of being arrested by the police, (C) is the ransom paid, ($-x$) the disutility of being caught, ($-y$) the disutility associated with the killing of the hostage, and ($-z$) the disutility of being caught in case the victim is executed.

Since $C > 0$, $y > 0$, and $x \le z$, the relation Eq. 2 always holds true, the kidnapper will never rationally decide to execute his threat. Moving to the upper node of the decision tree, player F has to choose the optimal offer C that maximizes his utility U taking into account the likelihood of a violent reaction by K:

$$U = (1 - \alpha)W_R + \alpha W_K \qquad (4)$$

where

$$W_R = -(1 - q)C \text{ and } W_K = -w. \qquad (5)$$

The parameter w captures the value of the hostage's life from the point of view of the family. Equation 4 shows that, on the one hand, the family F benefits from an offer reduction, but on the other hand, this strategy increases the probability of a sanction threat from K. So, the hostage's family will propose an offer C^* that maximizes its utility function. Equation 4 attains its maximum at C^* which can be interpreted as the best response given a, q, w, and D. Therefore, the optimal offer C^* is given by Eq. 6:

$$C^* = \begin{cases} D & \text{for } 0 < D \le \dfrac{aw}{(1+a)(1-q)} \\ \dfrac{w}{2(1-q)} - \dfrac{(1-a)D}{2a} & \text{for } \dfrac{aw}{(1+a)(1-q)} \le D \le \dfrac{aw}{(1-a)(1-q)} \\ 0 & \text{for } D \ge \dfrac{aw}{(1-a)(1-q)} \end{cases} \qquad (6)$$

Notably, C^* is increasing in D in the interval $0 < D \le \frac{aw}{(1+a)(1-q)}$ and then decreasing up to

$$\frac{aw}{(1-a)(1-q)}.$$

As a matter of fact, in the upper subgame agent K sets D in order to extract the largest offer from player F. It follows that the optimal value D^* is the following:

$$D^* = C^* = \frac{aw}{(1+a)(1-q)} \qquad (7)$$

When Eq. 7 holds true, player F will accept the kidnapper's offer, D^*, and the latter will release the hostage.

Finally, looking at the first node, the kidnapper has an incentive to engage in the act of kidnapping when $V_R > 0$, which means

$$\frac{aw}{(1+a)} > qx \qquad (8)$$

According to Eq. 8, kidnappings can be discouraged by increasing x or q and by decreasing a or w. Both x and q can be influenced by public policies, for instance, hardening punishment and spending more resources in detecting criminals. However, the effect of severity on x can be very tenuous in practice (Paternoster 2010), whereas the effect of increasing q can be less effective than expected due to its impact on the optimal offer from the family (which in case of capture recovers any ransom paid). This latter possibility can be mitigated by restricting the family's ability to pay. As for w, which cannot be influenced directly by public measures, it may be noted that it may affect the choice of kidnappers as to which member of the family to kidnap. The individual parameter a, instead, can partially be influenced by recommendations from the police and/or the insurance company on the way to handle the negotiations with the kidnappers.

By contemplating the possibility of an extreme reaction by the kidnapper, Selten's model bypasses situations in which one or both agents have a dominant strategy and succeeds in providing a compelling negotiation framework.

Going back to Fig. 1, if one removes the possibility of such reaction, $V_R > V_K$ and the kidnapper will always release the hostage. Hence, the optimal strategy for player F, given the dominant strategy of K, is not to pay the ransom D. The unique equilibrium is represented by the zero-payoff outcome. The choice of rational kidnappers, with no reputation to defend, does not depend on the payment but rather on the balance between the increased penalty in case of murder of the victim and the increased probability of being caught if the victim is left alive. Why then are people often willing to pay ransom?

To make sense of this puzzling result, referred to as "the mystery of kidnapping" (e.g., Gintis 2009), a modified model is required. For instance, with Harsanyi (1967), one can hypothesize the existence of two types of kidnappers: vindictive and self-regarding. So, for some values of p_v, the share of vindictive individuals among all kidnappers, the best strategy of the family is to pay the ransom. Alternatively, the family could incur additional psychic costs if a ransom is not paid (Gintis 2009). Then, a ransom would materialize as long as such additional costs exceed the kidnappers' request (but again the victim will be released only if the cost of freeing is less than the cost of killing the victim).

Hindering Ransom Payments

In order to fight ransom kidnapping by reducing its anticipated net benefits, both defensive and proactive measures can be adopted. Relative to the second type of measures, countries like Venezuela, Colombia, and Italy have banned both ransom payments and kidnap insurance, and the freeze of assets of the victim's family is often automatic. Despite the growing international consensus on similar measures in the case of terrorist-related kidnapping, these policies are highly controversial. As noted by Block and Tinsley (2008), "one may as well enact legislation forbidding a mugger's victim from responding "life" to the threat of "your money or your life."" To some extent such measures end up punishing the victim rather than the criminal, and, in any event, most people would see it as an unacceptable restriction of personal liberty. The standard justification is that ransom payment and insurance impart a negative externality on future victims, and by eliminating them the incentive to perpetrate kidnapping would disappear. Recent contributions uncover more subtle issues.

Fink and Pingle (2014), investigating within Selten's framework the impact of kidnap insurance, find that – under the assumption that kidnappers have a positive net willingness to kill – a market for kidnap insurance can benefit risk-averse agents, as long as it does not increase the risk of kidnapping too much. Individuals should fully insure in the latter case and partially insure otherwise. Since an insurance market enables the

families to rescue their loved ones from kidnappers more prone to murder but it may also increase the likelihood of kidnapping, the total effect on the number of kidnapping deaths is indeterminate. However, if the likelihood of kidnapping is only marginally affected, then a law banning kidnap insurance implies more fatalities.

Preventing ransom payments may have an impact not only on the risk and fatalities of kidnapping but also on the duration of the kidnapping experience. An extended duration escalates the harm of the crime. Detotto et al. (2014) study this problem in a simple setup in which as time passes the family becomes more willing to pay the ransom and the kidnapper balances the benefits and costs to extending the duration. The optimal stopping period, where K is no longer willing to take the chance of being caught to increase the amount collected in ransom, implies that duration grows inversely with the initial ransom offer, the probability of apprehension during the kidnapping, the probability the hostage dies or flees, the maintenance costs, and directly with the incremental increase in the ransom. Exploiting a micro-dataset on kidnapping incidents in Sardinia between 1960 and 2010 to estimate a semiparametric survival function, the authors find that the anticipated apprehension probability does not have a significant effect on duration, whereas the asset-seizure policy has mixed

effects: it leads to significantly shorter abductions (i.e., an express kidnapping), but if a kidnapping is not express some evidence is found that, in fact, duration might expand as the policy creates frictions in the collection of the ransom for the family (see Fig. 2, in which the vertical line corresponds to the year of implementation of the asset-seizure policy). The polarization is dramatic: to the right of the red line, kidnappings are either very short (less than a day on average) or very long (about 200 days on average).

Taken together with the observation that the frequency of kidnappings dropped significantly after the adoption of the asset-seizure policy, these results support interventions directed to reduce the anticipated benefit to kidnapping rather than focus on the costs.

Increasing Penalties for Kidnappers

Deterrence is a central concept in the economic model of crime (Becker 1968) because potential offenders rationally (though not necessarily consciously) consider and balance the costs and benefits of committing a crime. In this framework, criminals opt between legal and illegal activities according to their utility and budget constraint. In the real world, however, criminals not only must choose the optimal allocation of effort between

Ransom Kidnapping, Fig. 2 Kidnapping duration over time
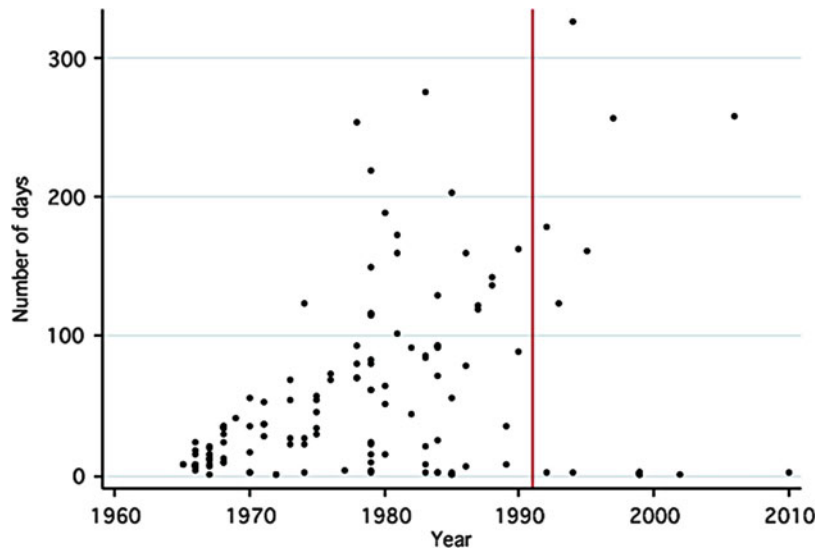
legal or illegal activities, but they may allocate their effort between several crime offenses. The idea of marginal deterrence recognizes that the setting of sanctions for one particular offense not only affects deterrence of that crime but also affects the incentives to engage in other activities. In his pioneering analysis of the subject, Shavell (1992) explicitly refers to the classic example of kidnapping/murder as an application of marginal deterrence.

Recently, Detotto et al. (2015) propose a reasonable application of the theory of marginal deterrence related to kidnapping and its complement, murder. While the death exposes the criminals to punishments, if the sanction for kidnapping is great, then the marginal sanction for homicide is reduced.

They use a unique data set of kidnappings in Italy between 1960 and 2013 to test the theory of marginal deterrence. Kidnapping was a major concern for Italy in the 1960s, and, as a consequence, in 1974 a new set of sentencing policies were set with greatly enhanced punishments for the crime. Precisely, the range penalty passed from imprisonment for 8–15 years to 10–20 years, if the ransom was not paid, and from 12–18 years to 12–25 years, if the ransom was actually paid. Such reforms, though, did not change the sanction for murder which was punishable with 21 years to life

sentences. Thus, marginal deterrence of death reduced. Later, in 1978 in response to increased homicides, the Italian government escalated sanctions for deaths resulting from kidnappings, addressing the marginal deterrence problem. The new change law enacted in May 1978 specifically increased the sanction for deaths associated with kidnapping.

Figure 3 provides illustration of kidnapping-related deaths over time. The vertical dashed lines denote the policy changes. As the theory of marginal deterrence predicts, the adoption of the enhanced sanctions for kidnapping in 1974 resulted in an increase in the prevalence of death, while the latter became minimal after the 1978 policy.

To test the hypothesis that the changes in the sanctions affected the incentive to murder the victim, a binary probit model is estimated with the dummy variable death as the dependent variable and the characteristics of the victim, time of year, and location as the controls. The results in Table 1 provide confirmation of the theory. The adoption of the enhanced sanctions for kidnapping in 1974 resulted in an increase in the prevalence of death. Precisely, the marginal effect is estimated to increase the likelihood of death occurrence by 4%. Then, according to the predictions of the theory, the escalation of sanctions

Ransom Kidnapping, Fig. 3 Number of kidnapping-related murders
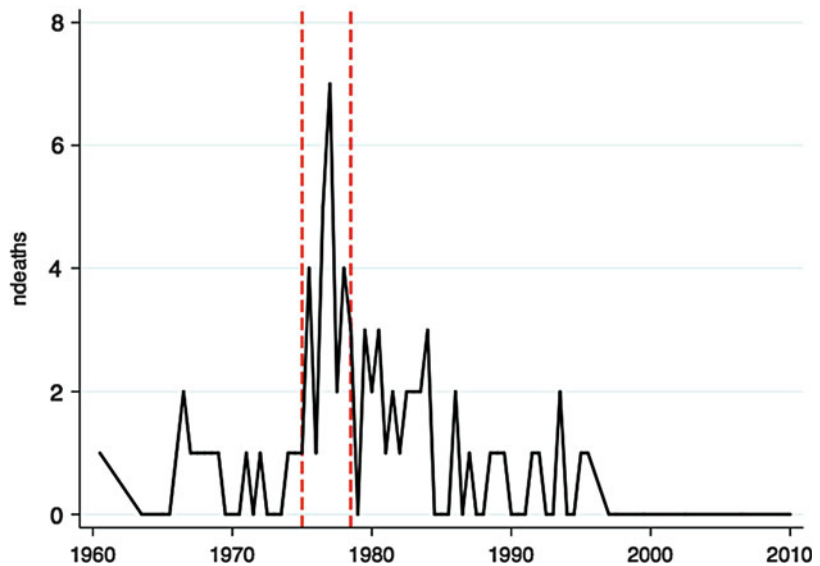
Ransom Kidnapping, Table 1 Probit analysis (dep. var. = death)

	(I)	(II)	(III)
D1974	0.04*	0.05*	0.04**
	(0.03)	(0.03)	(0.02)
D1978	−0.05**	−0.05**	−0.03*
	(0.03)	(0.02)	(0.02)
Events	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)
Female	−0.04**	−0.04**	−0.04**
	(0.02)	(0.02)	(0.0)
Age	0.003***	0.003***	0.002***
	(0.001)	(0.001)	(0.001)
Local	−0.07*	−0.08**	−0.01
	(0.05)	(0.05)	(0.06)
Italian	−0.06**	−0.06**	−0.03
	(0.02)	(0.02)	(0.05)
Paid	−0.12***	−0.12***	−0.10***
	(0.03)	(0.03)	(0.02)
Pseudo-R2	0.159	0.157	0.173
Wald	69.49***	69.89***	924.34***
Log-likelihood	−185.84	−186.45	−174.31
N	593	593	574

***1 %, **5 %, *10 %; marginal effects and robust standard errors are reported in parentheses. A constant term is included in each specification. Controls: victim occupation, season, and region of capture

(I): 1974 and 1978 are lagged 3 months, (II): 1974 and 1978 are leaded 3 months, (III): dropped all obs. in the range [−3, +3] months of both 14 October 1974 and 18 May 1978

for kidnap-murders of 1978 reduced the prevalence of death, which, in numbers, is estimated to have declined by 5%.

Conclusion

While the categorization of kidnapping for ransom as organized crime is uncertain, in many regions of the world modern-day hostage taking for ransom is carried out mostly by highly organized criminal firms on a historically unprecedented scale. Recent trends show a blurring of the boundaries between ransom kidnapping, piracy, and terrorism together with an increasing international dimension that parallels contemporary legal globalization. The contributions reviewed in this entry stress the importance of both classical instruments and more controversial measures, like banning ransom insurance and/or ransom payments, to counteract the crime. However, given the likelihood of unintended negative effects (on fatalities, duration of the kidnapping experience, and burden falling on enterprises) in some environments, policies aimed at reducing kidnapper's anticipated benefits through these channels must carefully balance the benefits for society at large against the higher costs imposed on specific groups.

Cross-References

▶ Crime and Punishment (Becker 1968)
▶ Crime: Organized Crime and the Law
▶ Piracy, Modern Maritime
▶ Terrorism

References

Alix EK (1978) Ransom kidnapping in America, 1874–1974: the creation of a capital crime. Southern Illinois University Press, Carbondale

Astorga L (2012) México: organized crime politics and insecurity. In: Siegel D, Van de Bunt H (eds) Traditional organized crime in the modern world. Springer, New York, pp 149–166

Becker GS (1968) Crime and punishment: An economic approach. Journal of Political Economy: 76:169–217

Block W, Tinsley P (2008) Should the law prohibit paying Ransom to kidnappers? Am Rev Polit Econ 6:40–45

Casalunga L (2013) Sequestri di persona in Italia. Il Maestrale, Nuoro

Crelisten R, Laberge-Altmejd D (1976) Report on Management Training Seminar Hostage-Taking Problems of Prevention and Control. Montreal, National Institute of Justice

Cressey D (1969) Theft of the nation: the structure and operations of organized crime in America. Harper, New York

Detotto C, McCannon B, Vannini M (2014) Understanding Ransom kidnappings and their duration. BE J Econ Anal Policy 14:849–872

Detotto C, McCannon B, Vannini M (2015) Evidence of marginal deterrence: kidnapping and murder in Italy. Int Rev Law Econ 41:63–67

Di Tella R, Edwards S, Schargrodsky E (eds) (2010) The economics of crime lessons for and from Latin America. The University of Chicago Press, Chicago

Dick AR (1995) When does organized crime pay? A transaction cost analysis. Int Rev Law Econ 15:25–45

Ebbe ONJ (2012) Organized crime in Nigeria. In: Siegel D, Van de Bunt H (eds) Traditional organized crime in the modern world. Springer, New York, pp 169–188

Enders W, Sandler T (2005) The political economy of terrorism. Cambridge University Press, New York

Fink A, Pingle M (2014) Kidnap insurance and its impact on kidnapping outcomes. Public Choice 160:481–499

Garoupa N (2007) Optimal law enforcement and criminal organization. J Econ Behav Organ 63:461–474

Gintis H (2009) Game Theory Evolving: A Problem-Centered Introduction to Modeling Strategic Interaction (Second Edition). Princeton University Press, Princeton

Harrington J (2014) Games, Strategies, and Decision Making. Worth Pub, New York

Harsanyi JC (1967) Games with incomplete information played by "Bayesian" players. The Basic model. Management Science 14:159–182

Kassim M, Mohamed N (2008) Kidnap for ransom in South East Asia. Asian Criminol 3:61–73

Levitt S, Rubio M (2000) Understanding crime in Colombia and what can be done about it. Working papers series. Bogotà, Fedesarrollo

Marongiu P, Clarke RV (2004) Ransom kidnapping in Sardinia: subculture theory and rational choice. In: Clarke RV, Felson M (eds) Routine activity and rational choice. Transaction Publishers, New Brunswick, pp 179–199

Paternoster R (2010) How much do we really know about deterrence? J Crim Law Criminol 100:765–823

Peltzman S, Fiorentini G (1995) The economics of organised crime. Cambridge University Press, Cambridge

Pshiva R, Suarez GA (2010) Capital crimes: kidnappings and corporate investment in Colombia. In: Di Tella et al. (ed) The economics of crime: lessons for and from Latin America. Chicago, National Bureau of Economic Research

Schelling T (1971) What is the business of organized crime? J Public Law 20:71–84

Selten R (1976) A simple game model of kidnapping. Institute for Mathematical Economics at Bielefeld University, working paper no 45

Shavell S (1992) A note on marginal deterrence. Int Rev Law Econ 12:345–355

Varese F (2010) What is organized crime? In: Varese F - (ed) Organized crime (critical concepts in criminology). Routledge, London, pp 1–35

Williamson OE (1985) The economic institutions of capitalism. Free Press, New York

Wright RP (2009) Kidnap for Ransom: resolving the unthinkable. Taylor & Francis Group, Boca Raton

Rape

▶ Sex Offenses

Rationality

Anne-Marie Mohammed[1], Sandra Sookram[2] and George Saridakis[3]
[1]Department of Economics, Faculty of Social Sciences, The University of the West Indies, St. Augustine, Trinidad and Tobago, West Indies
[2]Sir Arthur Lewis Institute of Social and Economic Studies, The University of The West Indies, St. Augustine, Trinidad and Tobago, West Indies
[3]Small Business Research Centre, Business School, Kingston University, London, UK

Synonyms

Analytical; Coherence; Common sense; Deduction; Inference; Judgment; Optimality; Reasonableness

Definition

Rationality involves the evaluation of choices to achieve a goal or to find the optimal solution to a

problem. Simon (1972, p. 161) defined rationality as "a style of behavior that is appropriate to the achievement of given goals, within the limits imposed by given conditions and constraints."

Introduction

The notion of rationality has become a central idea in the various disciplines within the social sciences. This entry discusses the concept of rationality, which has been a core concept in the explanation of human behavior in economics and the other social sciences. In the field of economics, it is expected that individuals behave rationally and that organizations should make rational decisions. A substantial number of economic theories are established under the assumption that when individuals act they do so in a rational manner. Simon (1957) revises this assumption by proposing the idea of bounded rationality. The concept of bounded rationality accounts for the fact that a perfectly rational decision cannot be made because of shortcomings that individuals face with regard to the inadequacy of information, the time constraints, and the limitations to their cognitive processes. This entry gives particular emphasis to subject areas within economics where rationality plays an important part in the formulation of theories and in explaining behavior, particularly the economics of crime.

The structure of the entry is as follows. We start the entry by examining the concept of rationality in economics. The entry proceeds by analyzing the influence of economic rational choice theory on the development of an economic theory of crime and its impact on crime and in the crafting of policy. The last section concludes the entry by offering some key observations and directions for future research.

Rationality and Economics

Karl Popper's 1967 essay, "The Rationality Principle", was one of the first studies that linked the concept of rationality to social sciences (Karl Popper 1967 essay in Miller 1985.) According to Popper's principle, one should analyze social processes by assuming that "agents always act in a manner appropriate to the situation in which they find themselves" (p. 361). Popper's view of rationality embraced a nation of situational analysis, and he went on to note that it is able to explain, "...the unintended social repercussions of intentional human actions" (Popper 1945/1966, p. 95). This concept by Popper was strongly criticized by many as it did not seem consistent with his principle of falsification. Others, such as considered the rationality principle to be consistent when taken with the view that it is "approximately false" and can be falsified in very rare cases.

Popper went on to contend that situational analysis is an approach employed by economics; this according to other researchers can be classified as neoclassical rationality. Langlois (1997) in his paper noted that the assumptions of the basic neoclassical model can be divided into four categories:

1. *Self-interest*: According to Langlois (1997), self-interested behavior can actually be categorized as purposeful behavior, and this purposefulness as pointed out by Vanberg (1993) is one of the more appealing elements of the neoclassical model. This assumption has been heavily criticized by researchers both in and outside the field of economics. This according to Langlois (1997) is because of a tendency to misidentify self-interest with selfishness.

2. *Omniscience*: This second assumption is another way of saying "perfect competition," which in neoclassical theory means that agents have perfect information with respect to a particular structure set out for them by the analyst. An example of this is the general equilibrium theory developed by Arrow-Debreu where economic agents are required to know all the utilities and production possibilities of all other agents. Langlois (1997) criticized this assumption based on the type of knowledge that economic agents are expected to have. He noted that the neoclassical model expects agents to have "structural knowledge" (full knowledge of the structure of the economic problem that they face) but not "parametric knowledge"

R

(full knowledge of all the parameters). He went on to state that in neoclassical theory it is generally the case to relax the assumption of "perfect knowledge" but this falls more often on the side of "parametric knowledge." This is problematic because more often than not people are ignorant of the very nature of the problem situation they face.

3. *Conscious deliberation*: The third assumption of the basic neoclassical model is that agents are consciously considering their options and then choosing among them. Langlois (1997) noted that as the field of economics has become more mathematical, economic agents are now solving more complicated problems through deliberation. Friedman (1953) presented the only alternative to this assumption noting that economic agents do not actually deliberate but rather behaved "as if" they had. This alternative view has not been readily accepted by most students of economic methodology.

4. *Representative agent*: Alfred Marshall (1961) established the assumption of the "representative agent." Marshall (1961) defined the representative firm as one that represents the typical properties of the population of firms as a whole and not just the properties of any particular firm. According to Langlois (1997) this definition was used so that some measure of "population" thinking can be accommodated in the theory of comparative statistics.

Rationality, in particular, is applied to the concept of game theory which is an essential aspect of microeconomics. Rationality is a central assumption of game theory irrespective of the different variations of the game that exist. In the context of game theory, a rational player is one who always chooses his/her most preferred outcome given the expectations of his/her opponent. Game theory according to Turocy and Stengel (2001) is defined as "the formal study of conflict and interest". Antoine Cournot (1838) was the first to discuss this in his study of duopolies. By the 1950s and the 1960s, the analysis was broadened to deal with problems like war and politics, as well as sociology and psychology. Turocy and Stengel (2001) noted that the strength in game theory is that it provides a structure for analyzing problems of strategic choices. Turocy and Stengel (2001, p. 5) in describing how game theory works noted that "The process of formally modelling a situation as a game requires the decision-maker to enumerate explicitly the players and their strategic options, and to consider their preferences and reactions."

The "game" in game theory involves modeling a situation that involves several players. Games can be categorized depending on the level of details involved in the process. For instance, there is coalition/cooperative game theory and then there is noncooperative game theory. The cooperative game theory requires a high level of description, and it investigates the power among different coalitions or as Turocy and Stengel (2001, p. 6) state it, "how a successful coalition should divide its proceeds." This type of game theory is most suited to situations in political sciences and international relations where "power" plays an important role. Noncooperative game theory is more concerned with how strategic choices are analyzed. It requires less details as it focuses more on the ordering and timing of players' choices as this is considered to be vital in determining the outcome of the game. This game is distinguished from cooperation because the modeling is done around the fact that players are making choices in their own interest, and while some cooperation might take place, it is only when players find it in their best interest. The ultimate goal of game theory, regardless of what type of game is being played, is to predict how the game will be played by rational players or at least how best to play rational opponents.

Prisoner's dilemma is one of the most popular examples of game theory in social sciences. The game occurs between two players where each player has two strategies, cooperate or defect. The term was coined by Albert W. Tucker in 1950 to describe a situation where two prisoners are taken into custody but the police officers only has evidence to arrest one of them (Holt and Roth 2004). The details of the game are that both criminals are questioned separately at the same time and thus they do not know what the other says – this is a simultaneous game. The prisoners

are then presented with different outcomes in an attempt to persuade them to confess to the crime. At this point both prisoners are aware of the same deal and know the consequences of their decision, which brings in the assumption of complete information and complete knowledge.

In Prisoners' dilemma the defect strategy dominates the cooperate strategy. It is assumed that a rational player will never choose to play a dominated strategy since the player will always be better off by switching to the other strategy. Thus within this game players will always choose to defect and some view this as an inefficiency of the model. One way that this can be overcome, as pointed out by Turocy and Stengel, is by playing the game repeatedly so that the cooperation strategy can be viewed as rational behavior to the players. In other words the fear of punishment in the future outweighs the benefits of defecting in the present.

Rationality, Deterrence, and Crime

Within the rational choice model used by economists, a new theory of criminal behavior was shaped to form what is known in the economics of crime literature as deterrence theory. Akers (1990) highlighted the link that binds deterrence theory to rational choice theory. He noted that both theories were based on the foundation of the utilitarian view of rational human behavior. Specifically Akers (1990, p. 654) noted that "Both theories assume that human actions are based on 'rational' decisions, that is, they are informed by the probable consequences of that action." He noted that for rational choice theory, an individual takes all his/her actions, whether lawful or criminal, into account when trying to maximize his/her payoff and minimize his/her cost. Similarly, for deterrence theory an individual considers the legal punishment of a crime against the motivation before engaging in the criminal behavior.

Becker (1968) was the first researcher to apply economic models of rational decision-making to crimes, and according to his work, "The economic analysis of crime starts with one simple assumption: Criminals are rational. A mugger is a mugger

for the same reason I am a professor-because that profession makes him/her better off, by his/her own standards, than any other alternative available to him/her. Here, as elsewhere in economics, the assumption of rationality does not imply that muggers (or economics professors) calculate the costs and benefits of available alternatives to seventeen decimal places-merely that they tend to choose the one that best achieves their objectives" (p. 43). In this seminal work, a supply offense function was derived which he defined as "relating the number of offences by any person to his/her probability of conviction, to his/her punishment if convicted, and to other variables, such as the income available to him/her in legal and other illegal activities, the frequency of nuisance arrests, and his willingness to commit an illegal act" (Becker 1968, p. 177).

Becker's model was then extended by Ehrlich (1973), who considered a time allocation model. Thus, in the basic economic crime model, individuals choose between allocating their time either to legitimate activities or illegitimate activities. Thus, crime and legal employment are viewed as substitute activities (i.e., if one chooses a legal activity, he/she will have less time for criminal activities), and the difference between legal and illegal opportunities is considered into the model (see Entorf and Spengler 2002). Researchers (see Entorf and Spengler 2002) have raised concerns, however, as to whether this assumption is helpful in explaining crimes by certain groups (e.g., juveniles, low-paid individuals), and made a number of important theoretical and empirical contributions to the economics of crime model since then (for a discussion see Witte and Witt 2002). The Becker-Ehrlich model, however, has formed the foundation for the literature on the economics of crime in which individuals are considered to be rational utility maximizers who take into account the cost and benefit of a crime before engaging in criminal activities, and thus, attitudes toward risk are essential to the model.

A Simple Deterrence Model
In the economic model of crime, criminals are assumed to be utility maximizers who seek to optimize their benefits under restrictions and risk

(Becker 1968). In the case of theft, burglaries, or property crime, the benefits are comprised of the material gains. In the case of violent crime, the payoffs are the transgressor utility derived from the infliction of an assault. Punishment is the major restrictor of crime since punishment is a cost imposed on the transgressor. The risk facing the transgressor is the probability of being caught. Mathematically this may be simply expressed as

$$\pi_i(s_i) = s_i(g - cp) \qquad (1)$$

where i is the criminal individual, π_i is the profit from the criminal activity, s_i is the tendency for the criminal to commit a crime, g is the combined monetary and psychic payoff for a certain criminal action, c is the probability of getting caught, and p is the punishment when caught. As seen from Eq. 1, higher punishment reduces criminal activities.

A major limitation of Becker's analysis is, however, the need for strategic interaction. The detection of crime is not an exogenous variable. The detection rate of criminal activity is a function of the actions of police officers, public prosecutors, and lawyers (Tsebelis 1989; Rauhut and Junker 2009). Additionally, criminals and law inspectors are engaged in a "discoordination game." Criminals tend to be more inclined toward committing a crime when they believe that they will not be caught or punished. In contrast, law inspectors are more inclined toward the investigation and inspection of criminals if it is believed that they will detect the crimes of the criminals (Rauhut and Junker 2009).

When game theory is applied to crime, criminals and law inspectors are assumed to be in a similar state of discoordination. In this game, if the law inspector detects a criminal committing a crime, they receive a reward r. The cost of the inspection for the law inspector is also given by k, thus the game may be represented by Table 1.

Rationality, Table 1 The inspection game

		Law inspector	
		Inspection	No inspection
Criminal	Crime	g-p, r-k	g, 0
	No crime	0, -k	0, 0

The information in this table shows that if the criminal commits a crime and there is inspection, his/her payout will be g-p. Since it is assumed that the criminal is caught in this scenario, the reward for the law inspector will be r-k. This is the material gain from the inspection less the cost of inspection. If the criminal committed no crime, but the inspector did an inspection, then the reward for the criminal will be 0; however, the inspector will bear the cost – k. If no inspection was done, and no crime was committed, then the payoff is 0 for both parties. In the scenario where no inspection was done, but the criminal committed a crime, the criminal will receive his/her payout of g.

Mathematically the payout functions for the criminal against the inspector and the inspector against the criminal are, respectively,

$$\pi_i(s_i, c_j) = s_i(g - c_j p) \qquad (2)$$

$$\emptyset_j(s_i, c_j) = c_j(s_i, r - k) \qquad (3)$$

where $\emptyset_j$ is the payoff function for the inspector, j who plays against the criminal, r is the reward for the law inspector for detecting a crime, k is the cost of the inspection for the law inspector, s_i is the tendency of the criminal to commit a crime, and c_j is the probability of getting caught. The Nash equilibrium of the joint strategies may be derived by finding the partial derivative of the payout functions (Rauhut and Junker 2009). The criminal finds the partial derivative of the law inspectors' payoff function $\partial \Phi_j / \partial c_j$ and sets it to 0. The criminal then expresses his/her probability of committing a crime as:

$$s_i^* = {}^k/_r \qquad (4)$$

The law inspector finds the partial derivative of the criminal's payoff function $\partial \pi_i / \partial s_i$ [i.e., the partial derivative of the profit for the criminal activity ($\partial \pi_i$) divided by the partial derivative of the tendency for the criminal to commit a crime (∂s_i)] and set it to 0. The law inspector expresses his/her probability of successful inspection as:

$$c_j^* = {}^g/_p \qquad (5)$$

The results of such game theory are counterintuitive. It suggests that higher punishment does not reduce crime; instead it reduces inspection behavior. Empirical evidence has been mixed on the relationship between crime and punishment. Gibbs (1968) found a negative association between the homicide rate and the severity of criminal punishment. Tittle (1969) found a weak-to-moderate negative association between the severity of criminal punishment and the homicide rate. Saridakis (2011), for example, found that costly deterrence-based policies adopted by governments may have a weak impact in deterring criminals from serious violent crime in the long run. In the following section, we discuss some of the findings documented in the literature and highlighted differences that have been observed between property crime and violent crime.

Empirical Evidence Based on Deterrence Model

According to the Federal Bureau of Investigation (FBI), four offenses – murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault – are defined as violent crimes. They went on to note that any crime that involves the force of threat of violence is deemed to be a violent crime. On the other hand, property crime is defined as theft-type offenses which involve the taking of property or money. Thus offenses such as burglary, larceny-theft, motor vehicle theft, and arson are considered to be property crimes. A wide range of research has been done on deterrence theory, which assesses the impact that deterrence measures, such as the probability of being caught and punished, has both on property and violent crime levels.

Specifically, Pauwels et al. (2011) noted that there are two categories upon which research in deterrence is categorized, and these are macro-level research and individual-level research. At the macro level researchers use official crime statistics to determine the relationship between objective punishment levels and crime, while on the individual basis, they use survey methods to assess the relationship between sanctions and self-

reported crime. The Bayesian updating method is employed at the individual level and was developed by Edwards et al. (1963) and, according to Saridakis and Sookram (2014, p. 25), "...is based on a subjective belief that individuals begin with prior information, and as individual acquires more information through actions about offending and its outcomes, a rational individual would tend to rely more on this new information and less on his or her own beliefs...."

Using cross-sectional data from US states during the 1940s to the 1960s, Ehrlich (1996) was the first to empirically test the crime deterrence model. The results of his model showed a strong negative correlation between crime and criminal justice variables in the 10 out of 14 crime categories that he had included in the model. A major finding of the model was that law enforcement activities were not less effective in combating violent crime relative to property crime. This meant that a deterrence force acting on an individual in his/her decision to engage in crime was not stronger on violent criminal activities as opposed to property crimes. However this result was one of the few to show no distinction in the deterrence impact on property crimes over violent crimes. Woplin (1978), who used a model covering a longer time period, from 1894 to 1967, derived different results. He found that deterrence variables had a stronger impact on property crime as opposed to violent crime. Ehrlich (1996) and Woplin (1978) were not the only ones trying to ascertain the relationship and impact of deterrence variables on crime. A few examples of similar studies are from Entorf and Spengler (2000), Cherry and List (2002), Saridakis (2004), Buonanno and Montolio (2008), Saridakis and Spengler (2012), and Han et al. (2010).

Entorf and Spengler (2000) based their model on the traditional Becker-Ehrlich model but modernized it to include demographic changes, youth unemployment, and income inequality in the urban areas in Germany. In their study they were able to separate property crimes from violent crimes and they discovered that the clear-up rates for property crime were much higher than that for violent crimes. They went on to conclude that the deterrence hypothesis appeared to be

R

more applicable to property crime, and as such this type of crime was more directly related to a rational offender as opposed to violent crime offenders. Specifically Entorf and Spengler (2000, p. 23) noted in their paper that "For the rational offender, low legal income opportunities increase the probability of committing a crime."

Other researchers have carried out a number of studies that analyze the deterrence hypothesis and how it relates to both property and violent crimes. In their 2012 study, Saridakis and Spengler, for example, examined the relationship between crime, deterrence, and unemployment in Greece over the period 1991 to 1998 and received similar results to Entorf and Spengler (2000). Using a generalized method of moments (GMM) model, they found that property crimes were significantly deterred by higher clear-up rates and there was a positive relationship between property crime and unemployment. Violent crime on the other hand was not significantly impacted by unemployment and clear-up rates. In explaining this result, they noted that for violent crimes, the lack of impact of clear-up rates and unemployment may be due to the fact that these crimes are driven mostly by impulsive actions, while on the other hand property crimes are generally driven more by economic incentive and rational thinking.

In assessing the relationship between unemployment and violent crimes, Saridakis and Spengler (2012) specifically found that male unemployment had a positive and significant impact on rape levels but this relationship became insignificant when other factors were considered. In terms of female unemployment, the relationship with rape was also significant but strongly negative, and Saridakis and Spengler (2012) noted that this could be explained by the routine activity theory. (Routine activity theory states that crime occurs when three elements come together which are an accessible target, the absence of an adult guardian, and the presence of a motivational offender.)

As noted earlier, one of the reasons that deterrence policy seems to work more effectively on property crimes as opposed to violent crimes is the assumption that human beings are rational. Most of the research done in this area indicates that perpetrators of property crime tend to be more rational when deciding on whether or not to engage in this crime. This means that these perpetrators consider the consequences of their behavior before engaging in their crimes and as such they will consider any deterrence policies before engaging in the crime. Therefore, based on the assumptions of deterrence theory and on the econometric results by various authors, it can be stated that rationality is more aligned to property crimes while violent crimes are more driven by emotionality and impulsive actions rather than economic incentives.

Given that many researchers have determined that perpetrators of property crime are more rational than violent crime perpetrators, Saridakis in his 2004 paper attempted to determine the factors that influence violent crimes. In his study he examined violent crime in the United States during the 1960–2000 period and found no long-run relationships but significant short-run relationships. Specifically, Saridakis' (2004) results indicated that because violent crimes could be motivated by a variety of reasons, it was difficult to determine direct influencing factors for violent crimes as compared to economic factors that influence property crimes. With regard to the short run, his results showed that an increase in incarceration rates led to a reduction in the violent crime rates and as such could be viewed as a possible solution for dealing with violent crime. In terms of other factors, Saridakis (2004) found that income inequality had a positive impact only on murder. For the variable alcohol consumption, the study found a positive relationship with overall violent crime, and this results fall in line with other researchers such as Raphael and Winter-Ebmer (2001), Ensor and Godfrey (1993) and Field (1990). Generally this literature provides three reasons for the positive relationship between alcohol consumption and violent crimes:

1. Alcohol tends to influence a person's rationality when assessing the cost-benefit analysis of engaging in criminal behavior.
2. Offenders tend to consume alcohol after they have committed a crime in an attempt to excuse their behavior.

3. Users of alcohol tend to engage in more risky behavior as well as disregard their assessment of potential dangers and as such increase their chances of victimization.

In concluding his paper Saridakis (2004) noted that generally the effects of prison population on violent crimes are much smaller than that found by earlier researchers, such as Devine et al. (1988) and Marvell and Moody (1997). Saridakis further noted that, with the exception of income inequality and its positive relationship with murder, overall, economic factors tend to have an insignificant impact on violent crimes. Alcohol consumption was found to be one of the most impactful factors and thus he noted that it should be included in any study assessing violent crimes. His main conclusion was that investigating violent crimes is much more complicated than property crimes due to the fact that its perpetrators are less rational and thus there are many more motivating factors for engaging in crime and, along with other researchers such as Hartung and Pessoa (2004), concluded that the Becker-Ehrlich theory of deterrence is better suited to dealing with property crime as the many examples above show that these policies tend to have significant impacts in reducing the incidence of property crime.

Conclusion

Rationality and the theory of rational behavior have made important conceptual advances in explaining choices and decision-making and have been widely used by economists and other social scientists in various areas of research to provide solutions to different types of problems. This entry explores the concept of rationality and its role in formulating and shaping theories and in particular the association between the rationality principle and its impact on neoclassical economics. As shown rationality is a key component of the game theory aspect of microeconomics, and an analysis of the game theory example of the prisoner's dilemma is undertaken along with how rational behavior influences choices. The entry then focuses on the economics of crime

theory, in which criminals are assumed to behave as rational utility maximizers. The entry provides a detailed evaluation of rationality and the two major categories of crime – violent and property. It was pointed out, however, that the concept of rationality is better suited to formulating policy targeted to property crime rather than violent crime.

Cross-References

▶ Cost–Benefit Analysis
▶ Equilibrium Theory
▶ Good Faith and Game Theory
▶ Prisoner's Dilemma

References

Akers RL (1990) Rational choice, deterrence, and social learning theory in criminology: the path not taken. J Crim L Criminol 653

Becker GS (1968) Crime and punishment: an economic approach. J Polit Econ 76(2):169–217

Buonanno P, Montolio D (2008) Identifying the socioeconomic determinants of crime across Spanish provinces. Int Rev Law Econ 28(2):89–97

Cherry TL, List JA (2002) Aggregation bias in the economic model of crime. Econ Lett 75:81–86

Cournot A (1838) Mémoire Sur Les Applications Du Calcul Des Chances À La Statistique Judiciaire. journal des mathematiques pures et appliquees 12. T. 3

Devine JA, Sheley JF, Smith D (1988) Macroeconomic and social-control policy influences on crime rate changes, 1948–1985. Am Soc Rev 53(3):407–420

Edwards W, Lindman H, Savage LJ (1963) Bayesian statistical inference for psychological research. Psychol Rev 70:193–242

Ehrlich I (1973) Participation in illegitimate activities: a theoretical and empirical investigation. J Polit Econ 81(3):521–565

Ehrlich I (1996) Crime, punishment and the market for offense. J Econ Perspect 10(1):43–67

Ensor T, Godfrey C (1993) Modelling the interactions between alcohol, crime and the criminal justice system. Addiction 88(4):477–487

Entorf H, Spengler H (2002) Crime in Europe: causes and consequences. Springer, New York

Entorf H, Spengler H (2000) Socioeconomic and demographic factors of crime in Germany: evidence from panel data of the German states. Int Rev Law Econ Rev 20:1323–1357

Field S (1990) Trends in crime and their interpretation: a study of recorded crime in post-war England and Wales. Home Office Research Study, vol 119. HMSO, London

R

Friedman M (1953) The methodology of positive economics. In: Friedman M (ed) Essays in positive economics. Chicago University Press, Chicago

Gibbs JP (1968) Crime, punishment, and deterrence. Soc Sci Quart 48:515–530

Han L, Bandyopadhyay S, Bhattacharya S (2010) Determinants of Violent and property crimes in England and Wales: a panel data analysis. Department of Economics, University of Birmingham Discussion Paper 10-26R

Hartung G, Pessoa S (2004) Demographic factors as determinants of crime rates. Website: http://www.abep.nepo.unicamp.br/SeminarioPopulacaoPobrezaDesigualdade2007/docs/SemPopPob07_1062.pdf

Holt CA, Roth AE (2004) The Nash equilibrium: a perspective. Proc Natl Acad Sci 101(12):3999–4002

Langlois R (1997) Cognition and capabilities: opportunities seized and missed in the history of the computer industry. In: Garud R, Nayyar P, Shapira Z, dir (eds) Technological innovation: oversights and foresights. Cambridge University Press, New York, pp 71–94

Marvell T, Moody C (1997) The Impact of Prison Growth on Homicide. Homicide Studies, 1(3):205–233

Marshall A (1961/1890) Principles of economics, 1st edn. Macmillan, London

Pauwels L, Weerman F, Bruinsma G, Bernasco W (2011) Perceived sanction risk, individual propensity and adolescent offending: assessing key findings from the deterrence literature in a Dutch sample. Eur J Criminol 8:386–400

Popper K (1945/1966) The open society and its enemies, vol 1, 5th edn. Princeton University Press, Princeton

Popper K (1967) The rationality principle. In: Miller D - (ed) Popper selections. Princeton University Press, Princeton, pp 357–365

Raphael S, Winter-Ebmer R (2001) Identifying the effect of unemployment on crime. J Law Econ 44(1):259–284

Rauhut H, Junker M (2009) Punishment deters crime because humans are bounded in their strategic decision-making. J Artif Soc Soc Simul 12(3)

Saridakis G (2004) Violent crime in the United States of America: a time-series analysis between 1960–2000. Eur J Law Econ 18:203–221

Saridakis G (2011) Violent crime and incentives in the long-run: evidence from England and Wales. J Appl Stat 38(4):647–660

Saridakis G, Spengler H (2012) Crime, deterrence and unemployment in Greece: a panel data approach. Soc Sci J 49:167–174

Sardakis G, Sookram S (2014) Violent crime and perceived deterrence: an empirical approach using the offending, crime and justice survey. Econ Issue 19(1):23–55

Simon HA (1957) Models of man: social and rational. Wiley, New York

Simon HA (1972) Theories of bounded rationality. In: McGuire CB, Radner R (eds) Decision and organization. North-Holland, Amsterdam

Tittle CR (1969) Crime rates and legal sanctions. Soc Probl 16:408–423

Tsebelis G (1989) The abuse of probability in political analysis: the Robinson Crusoe Fallacy. Am Polit Sci Rev 83:77–91

Turocy TL, Stengel B von (2001) Game theory. CDAM research report LSE-CDAM-2001-09

Vanberg V (1993) Rational choice, rule-following and institutions– an evolutionary perspective. In: Maki U, Gustafsson B, Knudsen C (eds) Rationality, institutions, and economic methodology. Routledge, London

Woplin K (1978) An economic analysis of crime and punishment in England and Wales, 1847–1967. J Polit Econ 86(5):815–840

Witte AD, Witt R (2002) Crime causations: economic theories. In: Dressler J (ed) Encyclopedia of crime and justice, vol 1, MacMillan reference library. Free Press, New York, pp 302–306

REACH Legislation

Sylvain Béal[1], Marc Deschamps[1] and Philippe Solal[2]
[1]CRESE EA3190, Université Bourgogne Franche-Comté, Besançon, France
[2]CNRS UMR 5824 GATE, Université de Saint-Etienne, Saint-Etienne, France

Abstract

Since 13 December 2006, the European Union is in a phase of implementation of a new harmonized legislative framework in the field of chemical industry: the REACH regulation (an acronym for Registration, Evaluation, Authorization, and Restriction of Chemicals). From a law and economics perspective, a large set of questions emerge with this regulation. In our entry, we will only shed some light on those which have already been analyzed, such as competition, data sharing, innovation, and socioeconomic analysis.

Introduction

The European REACH legislation is crucial for at least two reasons: it concerns the European chemical industry, and it is one of the most complex legislations that the European Union has ever decided to adopt and implement.

Chemical products are both found in nature and man-made. In our daily lives (food, paint, glue, ink, medication, cosmetics, etc.), they take the forms of *substances*, i.e., chemical elements and their compounds; of *preparations*, i.e., mixtures or solutions composed of at least two substances; and of *articles*, i.e., objects for which the shape, surface, or pattern are more important than their chemical components. The European Commission estimates that close to 100,000 different substances are used on the European territory. The chemical industry in the European Union is responsible for approximately 21% of world sales, is the world leader of exports, has several influential multinational corporations, and directly employs 1.2 million people.

Apart from its sectorial importance, the REACH regulation is also exceptional from the legal and institutional point of view (see Bergkamp 2013). It took almost 9 years of discussions and confrontations (1998–2006), including a White Paper (COM 2001, 88 final) and an internet consultation in May 2003 which received more than 6000 contributions, to publish this legislation in the Official Journal of the European Union on 30 December 2006, coming into force on 1 June 2007.

This legislation is originally constituted by Regulation No 1907/2006, consisting of 850 pages and 141 articles, as well as by Directive 2006/121/EC. It also creates a new European body, the European Chemicals Agency (ECHA), whose purpose is to ensure its proper application. This entry provides a presentation of the REACH regulation, which applies to all members of the EEA, in four sections: the genesis and objectives of REACH (1), the structuring principles of REACH (2), ECHA (3), and the role of socioeconomic analysis in REACH (4).

Origins and Goals of REACH

At an informal meeting in Chester on 26 April 1998, the European environment ministers engaged in a debate on community policy on chemicals. They came to the conclusion that a revision of the latter was necessary. The European Commission then assessed the four main legal instruments governing chemical substances (Regulation No 793/93 and Directives 67/548/EEC, 88/379/EEC, 76/769/EEC) and diagnosed at least three very serious problems.

First, the system made a distinction between substances marketed before September 1981 and those marketed afterward, requiring only the latter to undergo testing and assessment of risks to health and the environment. This led, as explicitly stated in the White Paper EU Commission (2001, p. 6), to "a general lack of knowledge about the properties and uses of existing substances," since the substance of the previously existing substances represented more than 99% of the total volume of substances on the European market. In addition, it was pointed out that it seemed inadequate, inefficient, and costly to entrust the assessment of dangerousness to the authorities and not to the firms. Finally, the report stressed that current legislation only required manufacturers and importers to provide information on their products, thus neglecting all data on downstream uses (industrial users and formulators).

With this in mind, the European Commission set out in the White Paper of 27 February 2001 a number of proposals for action and the draft of a concerted European policy to solve these problems, thus initiating the steps that would lead to the adoption of REACH. It should be noted that in the impact studies used by the European Commission to evaluate the results that could be expected following the adoption of REACH, it was explained that the positive effects on public health would be in the order of 50 billion euros (for a presentation of the various impact studies that preceded the adoption of REACH, see Schuseil 2013). To this could also be added the benefits of innovation if the Porter hypothesis proved to be valid (see Ambec et al. 2013; Arfaoui et al. 2014, for more details on the links between regulation and innovation).

The first paragraph of Article 1 of Regulation No 1907/2006, setting out the political objectives of the strategy proposed by the European Commission in the White Paper, makes clear that REACH has three hierarchical and cumulative objectives: (1) to ensure a high-level protection of human health and the environment, (2) to allow the free movement of substances in the internal

R

market, and (3) to improve competitiveness and innovation.

Finally, it should be noted that this legislation is one of the main manifestations of the EU's commitment to the plan adopted at the Johannesburg World Summit in 2002, which aimed to ensure that, from 2020, chemicals would be produced and used in a manner that minimizes health and environmental effects.

REACH's Structural Principles

The overall functioning of REACH is based on a single integrated system consisting of four phases: registration, evaluation, authorization/restriction, and controls and sanctions. We will concentrate mainly on the first phase.

To remove the main flaws of the previous system, REACH has, on the one hand, abolished the distinction between existing substances and new substances and, on the other hand, reversed the burden of proof of safety. Thus, as a matter of principle, all substances and preparations must be notified to ECHA by the companies wishing to use them, except for the exemptions referred to in Article 2 (e.g., radioactive substances, medicines, waste), those requested by the member states in respect of their national defense, and the derogations provided for in Annexes IV and V to the Regulation. It is therefore up to the manufacturers, importers, or downstream users of chemicals to provide the authorities with all the information necessary for the demonstration of the absence of effect on the health and environment of the latter.

In the absence of such registration, the manufacture, importation, and use of these products are illegal, as Article 5 states: "no data, no market." Given the particularly substantial dimensions of REACH, the Regulation provided that these obligations would be implemented gradually and with a growing regulatory requirement based on tonnage. The implementation of the REACH registration phase takes place according to the following timetable: (1) before 30 November 2010 for substances produced at more than 1,000 tons per year, (2) before 31 May 2013 for substances produced between 10 and 100 tons per

year, and (3) before 31 May 2018 for substances produced at more than 1 ton per year. Furthermore, REACH requires the existence of a chemical safety report in the registration dossier only for substances produced at more than 10 tons per year.

To our knowledge, the aspect that has received the most attention in terms of registration is information. In order to avoid duplication costs and vertebrate animal testing, REACH has imposed an obligation on manufacturers, with the exception of the derogation until 1 June 2018 (the date of the end of the implementation of REACH), to share the information they have in SIEF (Substance Information Exchange Forum). Three elements emerged that could be problematic: information content, competitive aspects, and financing. We shall now return successively to these three points.

The first was whether the information required by REACH should relate only to risks known with certainty. This issue has been clearly resolved since Article 191 of the Regulation states that the EU's environmental policy is based, inter alia, on the precautionary principle. As a result, manufacturers must also take into account the potential risks in their file and indicate which preventive actions they intend to take (on the economic analysis of the precautionary principle, see Gollier et al. 2000).

The second issue was whether companies could not use REACH as a support for anticompetitive strategies (Béal et al. 2011). The most common idea would be to strategically use this sharing of technical information, either to exchange commercial information and thus reach cartels or, on the contrary, to create extremely expensive data to prevent certain firms from remaining in the market by increasing their costs and thereby abusing of a dominant position. Recital 48 and Article 25 of the Regulation recall that the application of the European competition rules remains valid. We are not aware of any infringements relating to possible anticompetitive behavior these last years. This being said, it should be pointed out that the latest general report of the

European Commission (2013, p. 5) stresses that: "The cost of REACH registration has discouraged some companies from competing on certain substances markets, which in these cases have increased market concentration and prices."

Finally, the third element was related to the financial impact of data sharing, i.e., the question of how to implement a compensation mechanism between the various stakeholders. As an indication, as of September 2007, ECHA proposed a guide which it updated last November (see ECHA (2016)). We can also note, notably thanks to the work of Dehez and Tellone (2013), Béal et al. (2010), Béal and Deschamps (2016), and Béal et al. (2016), that this issue was the subject of a thorough study leading to the conclusion that cooperative game theory offers both a structured discussion path and clear answers depending on the properties desired by the stakeholders.

Lastly, it should be noted that the EU member states operate at a double level to make the regulatory system work, since they are both responsible for providing a national free assistance service for industrialists (art. 124) and also for participating in the controls, inspections, and sanctions of offenders on their territory (art. 126), which resulted in a change in their domestic legal systems.

ECHA (https://echaeuropa.eu)

ECHA (European Chemicals Agency) has been operational since 1 June 2007 with headquarters in Helsinki, Finland. It employs approximately 600 people and has an annual budget of around 100 million euros. Its main role is to implement, inform, and enforce the European REACH regulations as well as those relating to the classification, labeling, and packaging of chemical substances (CLP, No. 1272/2008), to biocidal products (BPR, No. 528/2012), and to prior informed consent for imports and exports of certain dangerous chemicals (PIC, No. 649/2012).

In addition to its administrative nature, ECHA has the particularity of housing within it a court:

the Board of Appeal. It decides independently on appeals against certain decisions taken by ECHA under the REACH and BPR regulations (on the link between the question of the sharing of data and the Board of Appeal, see Béal and Deschamps 2016). Its decisions, where they are not final, are subject to appeal before the European Union Tribunal and an appeal to the Court of Justice of the European Union.

Socioeconomic Analysis Inside REACH

Socioeconomic analysis (SEA) is used in the REACH regulation either in the context of a request for the use of a substance subject to authorization (Annex XIV) or in the context of a restriction proposal (Annex XVII). In each of these cases, the objective is to assess the costs and benefits to society of the use (or nonuse) of a substance. In its checklist, ECHA distinguishes among five different types of impacts to be taken into account in the context of a SEA: risks to human health, environmental risks, economic impacts, social impacts, and economic impacts. In addition to the cost-benefit analysis, the ECHA guide (2011) recommends the use of multicriteria analysis, cost-effectiveness analysis, compliance cost analysis, and macroeconomic modeling. The use of SEA can be considered to offer two valuable advantages: the transparency of the elements taken into account and a structured framework allowing the consultation of the stakeholders.

Summary

As REACH regulation will completely come into force on 1 June 2018, it is difficult to have a sufficient knowledge on it before almost 2028. Nevertheless, the early stages of implementation have already produced a new European chemical market structure and innovation behavior which have led to new developments in law and economics. We are convinced that for the next 10 years, lawyers and economists will have much to analyze both theoretically and on the application of REACH.

R

Cross-References

References

Ambec S, Cohen MA, Elgie S, Lanoie P (2013) The Porter hypothesis at 20: can environmental regulation enhance innovation and competitiveness? Rev Environ Econ Policy 7(1):2–22

Arfaoui N, Brouillat E, Saint-Jean M (2014) Policy design and technological substitution: investigating the REACH regulation in an agent-based model. Ecol Econ 107:347–365

Béal S, Deschamps M, Ravix J, Sautel O (2010) Les informations exigées par la législation REACH : une analyse du partage des coûts. Rev Econ Polit 120:991–1014

Béal S, Deschamps M, Ravix J, Sautel O (2011) La mise en place de la législation européenne REACH : une analyse des effets anticoncurrentiels. Revue de l'OFCE 118:113–128

Béal S, Deschamps M (2016) On compensation schemes for data sharing within the European REACH legislation. Eur J Law Econ 41:157–181

Béal S, Deschamps M, Solal P (2016) Comparable axiomatizations of two allocation rules for cooperative games with transferable utility and their subclass of data games. J Publ Econ Theory 18:992–1004

Bergkamp L (ed) (2013) The European union REACH regulation for chemicals: law and practice. Oxford University Press, Oxford

Dehez P, Tellone D (2013) Data games: sharing public goods with exclusion. J Publ Econ Theory 15:654–673

ECHA (2011) Guidance on the preparation of socioeconomic analysis as part of an application for authorisation. Version 1, January, 260 p

ECHA (2016) Guidance on data sharing. Version 3, November, 200 p

EU Commission (2001) Strategy for a future chemicals policy-white paper. COM(2001) 88 final, 27 February, Brussels, 32 p

EU Commission (2013) General report on REACH. COM(2013) 49 final, 5 February, Brussels, 15 p

Gollier C, Jullien B, Treich N (2000) Scientific progress and irreversibility. An economic interpretation of the precautionary principle. J Public Econ 75:229–253

Schuseil Ph (2013) Les études d'impact du règlement REACH. Rapport pour les Cahiers de l'évaluation du Trésor, 126 p

Real Options

Peter-Jan Engelen[1,2] and Danny Cassimon[3]
[1]Utrecht School of Economics (USE), Utrecht University, Utrecht, The Netherlands
[2]Faculty of Business and Economics, University of Antwerp, Antwerpen, Belgium
[3]Institute of Development Policy and Management (IOB), University of Antwerp, Antwerp, Belgium

Definition

The incorporation and valuation of operational flexibility and of strategic value of investments in the decision-making process under uncertainty. The option nature of the investment decision arises from the coexistence of uncertainty, irreversibility, and timing flexibility and allows reaping upside potential while insulating from downside risk.

Introduction

The decision to allocate resources to investment opportunities is traditionally evaluated using a net present value (NPV) approach for private sector projects or a cost-benefit approach for public sector projects. Typically, it sums all the incoming and outgoing cash flows over the lifetime of a project, each discounted at an appropriate risk-adjusted discount rate to derive its present value. The latter is compared with the (current) initial investment cost needed to start the project. In case the outcome of this comparison renders a positive result, one decides to invest; in the other case, one rejects the project. While the NPV approach is a very valuable and a beautiful decision tool, its inherent limitations are well documented: it supposes a now-or-never decision and assumes the decision-maker to follow a rigid path once the investment decision is taken (Feinstein and Lander 2002).

In reality, in a dynamic environment with uncertainty and change, projects will often not materialize in the same shape as the decision-maker has initially expected, and he will have to

adjust the initial plans (Cassimon et al. 2004). During the lifetime of the project, new information may arrive or particular sources of uncertainty may be resolved, making it thus valuable to modify the project (Trigeorgis 2000). For instance, market demand for a product remaining below expectations will call for scaling down the project or vice versa; when demand is above expectations, a scale up might be appropriate. However, the NPV or cost-benefit model cannot handle operational flexibilities such as delaying, scaling up, scaling down, shutting down/ restarting, or abandoning a project (Guerrero 2007). Moreover, the NPV model cannot handle strategic dimensions of projects either (Kester 1984). This is the case when different investment projects are not independent of each other or when one specific project consists of different interconnected phases (Dixit and Pindyck 1994). A classic example is research and development (R&D). If a decision-maker would rigidly apply the cost-benefit rule to an R&D project, he would never implement it as its NPV *as a stand-alone project* would be negative. However, in reality many companies nevertheless invest in R&D. This illustrates the limitations of an NPV framework. Such capital budgeting decisions are better handled using a real option framework (Trigeorgis 2000).

This contribution will show that the optional nature is valuable in an investment environment characterized by the simultaneous existence of uncertainty, irreversibility of investment, and some freedom on the timing of the investment (Pindyck 1988). The added value of a real option approach lies in the fact that decision-makers focus more explicitly on proactively considering operational flexibilities or strategic aspects embedded in investment opportunities, rather than making a now-or-never decision to rigidly implement a project as initially planned (Trigeorgis 1996). Moreover, it also allows them to put a precise value on these flexibilities or strategic aspects. As such real option models are an important tool to replace soft decision-making based on vague and qualitative factors, which leave decisions more open to erroneous or manipulative outcomes.
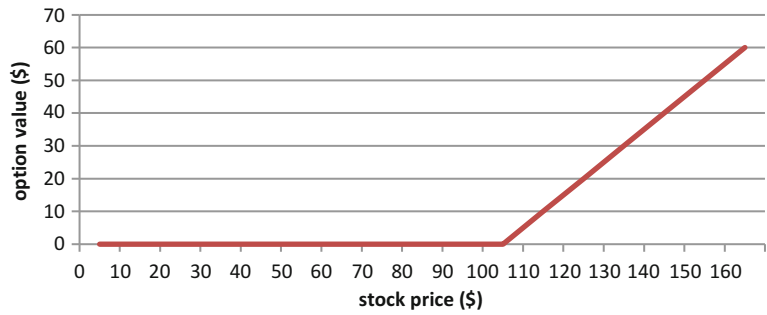
Financial Options and Analogy with Real Options

Recognizing the project itself or particular features of a project as having option characteristics is therefore the key to applying insights of real option modeling. In general, an option can be defined as the right, but not the obligation, to buy (in that case it is labeled a call option) or sell (in that case it is labeled a put option) the underlying asset at an agreed price (strike price or exercise price) during a specific period (as in the case of American options) or at a predetermined expiration date (as in the case of European options) (Hull 2011). Financial options exist on shares, on stock indices, on bonds, on currencies, and on many other financial assets.

For instance, a share of Apple Inc. is trading at $93.50 in the market. A European call option on one stock of Apple with an exercise price of $100 and expiration date in 3 months would cost about $2.40 today. This call option gives the holder the right to buy one share of Apple on the expiration day at $100. Whenever the share price at expiration is higher than the exercise price, the holder will make a profit by acquiring the share through exercising the option (at $100) and selling it at the higher market price at that moment (e.g., $120). In case the share price ends below the exercise price, the holder will not exercise the option and let it expire. Figure 1 shows the typical payoff profile of a European call option at expiration. In this way the holder of the option shields off negative share price evolutions while benefitting from positive share price movements. For having this luxury, the holder pays the option premium of $2.40 at the option exchange. If the call option was of the American type instead of the European type, the holder can exercise the option earlier than the expiration date. Cassimon et al. (2007) discuss under what conditions these call options will be exercised earlier.

In contrast to financial options, real options refer to the application of the option concept to real physical investment opportunities. Any decision to go ahead with an investment project can be viewed as exercising an option, whereby the firm has the right to obtain all the underlying cash flows that are resulting from the investment

R

Real Options, Fig. 1 The payoff profile of a European call option at expiration (excluding option premium)

Real Options, Table 1 Analogy of the value drivers of financial and real options and the impact of option value

Symbol	Financial options	Real options
V	Underlying asset price	Present value of the expected cash flows
I	Strike price	Investment costs
σ	Volatility of underlying asset return	Volatility of underlying project return
T	Time to maturity	Window of opportunity
r	Risk-free rate	Risk-free rate
δ	Amount of dividend payments	Opportunity costs of not exercising the option

project (the so-called value of the project, with symbol V), at a particular known cost (the investment cost, with symbol I); the latter is analogous to the exercise price in financial options. When the firm decides to go along with the investment project, it executes the option. In this way, one can draw a parallel between the structure of financial options' payoffs and the payoffs a firm or investor can obtain from a real investment project. Consequently, the argument is made that fundamental value drivers of financial options are also relevant for the valuation of real investment projects. Table 1 gives an overview of the basic value drivers of financial options and the corresponding variables in real investment projects. Apart from the two determinants that drive also the NPV (as the NPV equals V-I), note that the other parameters explicitly account for characteristics that embed flexibility and strategic considerations: the fact that future returns are uncertain, the fact that there is some leeway in timing the investment

decision, and the fact that returns may be foregone as long as the project is not yet started.

Basic Option Models

The valuation models for real options are based on financial option models. Probably the best-known model has been developed by Black and Scholes (1973). Its popularity is derived from its closed-form solution and fast and relatively simple computation. Its main disadvantage is due to the strict assumptions underlying the model: (i) frictionless markets, implying no transaction costs or taxes, nor restrictions on short sales; (ii) continuous trading is possible; (iii) the risk-free (short-term) interest rate is constant over the life of the option; (iv) the market is arbitrage-free; and (v) the time process of the underlying asset price is stochastic and exhibits a process assuming asset prices to be log-normally distributed and returns to be normally distributed. Obviously, any violation of some of these assumptions may result in a theoretical Black-Scholes option value which deviates from the price observed at the market. The option value C according to the Black-Scholes model can be calculated as

$$C = V e^{-\delta(T-t)} N(d_1) - I e^{-r_c(T-t)} N(d_2) \quad (1)$$

$$d_1 = \frac{\ln\left(\dfrac{V}{I}\right) + \left(r_c - \delta + \dfrac{1}{2}\sigma^2\right)(T - t)}{\sigma\sqrt{T - t}} \quad (2)$$

$$d_2 = \frac{\ln\left(\dfrac{V}{I}\right) + \left(r_c - \delta - \dfrac{1}{2}\sigma^2\right)(T - t)}{\sigma\sqrt{T - t}}$$

$$= d_1 - \sigma\sqrt{T - t}, \quad (3)$$

where V is the present value of the project's future operating cash flows, I the exercise price or the project's capital expenditure, $T - t$ the time to expiration (in years), σ the annualized standard deviation of the project return, r_c the continuous risk-free interest rate, δ the opportunity cost of waiting, and $N(d)$ the cumulative normal probability density function.

A more practical model that is often used in applications is the binomial option valuation model. This model assumes that in every time period Δt, the stock price moves either upward with factor u or downward with factor d, with $u = e^{\sigma\sqrt{\Delta t}}$ and $d = 1/u$ (Cox et al. 1979). One then has to determine the tree of future stock prices one is going to use as an approximation for future stock price evolutions. For instance, if time to expiration $T - t$ is 1 year and one uses 250 tree steps n, then the stock moves up or down every $\Delta t = \frac{T-t}{n} = \frac{1}{250}$ or approximately 1 step equals 1 trading day. In this case, the binomial model calculates the current option value by discounting at each node of the tree the upward and downward expected option values:

$$C = \{[C_u \times p] + [C_d \times (1-p)]\}e^{-r} \quad (4)$$

where C is the current option price, C_u is the expected option value in the upward world, C_d the expected option value in the downward world, p the risk-neutral probability that the stock moves upward with $p = \frac{e^r - d}{u - d}$, and r the risk-free interest rate.

Often more complicated option models are needed to handle the specific nature of the investment opportunities and/or the nature of embedded uncertainty. Such models include jump models (Merton 1976), compound option models (Cassimon et al. 2004), or barrier models (Engelen et al. 2016). A detailed discussion of these models is beyond the confines of this contribution, but we refer the reader to the references for further details.

Different Types of Real Options
Different theoretical types of real options have been developed in the early literature: options to

delay (McDonald and Siegel 1986), growth options (Amran and Kulatilaka 1999), options to abandon (Myers and Majd 1990), or scale options (Trigeorgis and Mason 1987). This section starts by discussing the investment "timing option" (or option to delay). Next, we analyze "growth options" (single stage) or "sequential options" (multiple stages) which open up new options upon exercise. This type of option is important when investments are needed to develop new technology or open up new markets. A fourth type we distinguish is the "option to abandon" the project at salvage value. Finally, there are a series of "operational flexibility options," including the flexibility (at some additional cost) to scale up (expand), to scale down (contract), to stop and restart operations, or to switch to other inputs or outputs in response to market and cost developments; each of them can be valued correctly using a real option framework.

Option to Delay
The option to delay (or wait) focuses on the optimal investment timing. It examines whether a company should implement a project right now or better postpone the investment for x months/ years before taking the investment decision. The advantage of waiting is that it allows a company to avoid being stuck in an irreversible loss-making investment if project conditions move in an unfavorable way (Ingersoll and Ross 1992). During the period of waiting, the company can learn or collect more information about sources of uncertainty to take a better informed decision at a later point in time (McDonald and Siegel 1986).

Consider an investment project with an economic life span of 15 years, and it is expected to yield every year free operating cash flows of 120 million euro. To enter into this investment opportunity, the firm has to pay an initial investment expenditure of 800 million euro. The company's cost of capital is 10%, while the risk-free interest rate amounts to 5%. The uncertainty of the market demand for these products, as measured by the standard deviation, is estimated to be 30%. Suppose, management wants to know whether to invest in this project immediately or to postpone the project with 1 year (during which

more information concerning the profitability of the project becomes available). This is an example of an option to delay. According to the traditional NPV rule, this is a valuable project which should be implemented immediately. For, the NPV amounts to $\sum_{t=1}^{15} \frac{120}{(1,10)^t} - 800$ or 112 million euro. Does real option analysis yield a different result? If the decision is postponed for 1 year, this option to delay has a value of 133 million using a binomial option model with 250 tree steps. To come to this figure, we used the following input parameters: the present value of the cash flows from year 2 to year 16 being 829.75 (V), the investment outlay of 800 (I), the option's time to maturity of 1 year ($T - t$), volatility of 30% (σ), and the risk-free interest rate of 5% ($r F$). Calculations can be checked through Derivagem (2014).

Because the real option value (measuring the value of delaying of the investment) exceeds the NPV (measuring the immediate investment value), it is better for the firm to postpone the decision with 1 year instead of investing immediately. In 1 year time, the firm can take a more informed decision. Note that delaying investments is not always possible. Also, firms will invest earlier when there is some opportunity cost of waiting (the parameter δ) such as losing market share or the loss of first-mover advantages. Any opportunity costs by waiting have to be deducted from the real option value. If in our example opportunity costs are estimated to be 30 million euro, the real option value is only 103 million, reversing the company's decision as investing immediately will yield a higher value of 112 million euro.

Growth Option

Growth options occur when projects consist of two phases or stages. The first stage is a prerequisite in order to be able to consider the following phase. Take, for instance, a project that is in fact a pilot scheme for a large-scale project. It is clear that this pilot scheme has option characteristics. The large-scale project can only be considered when the firm has indeed decided to execute the pilot phase (see Fig. 2). However, in case the pilot phase turns out to be a failure, the company does not move to the second phase and just terminates the project (Cassimon et al. 2011b). As such, the pilot phase gives the firm a call option on the large-scale project. The investment cost of the large-scale project and the additional future cash flows that result from it are the execution price, respectively, and the underlying asset of the option (Kester 1984). The value of this call option should be taken into account when calculating the value of the pilot phase, by adding this option value to the conventionally calculated NPV of the pilot phase. It might well be the case then that projects, which would be rejected on the basis of a negative NPV, are now worth executing due to their option value. If the sum of the growth option and the net present value of the pilot phase is positive, it is therefore rational for the firm to invest in the pilot project as the entire project has enough upside

Real Options, Fig. 2 Typical profile of a growth option
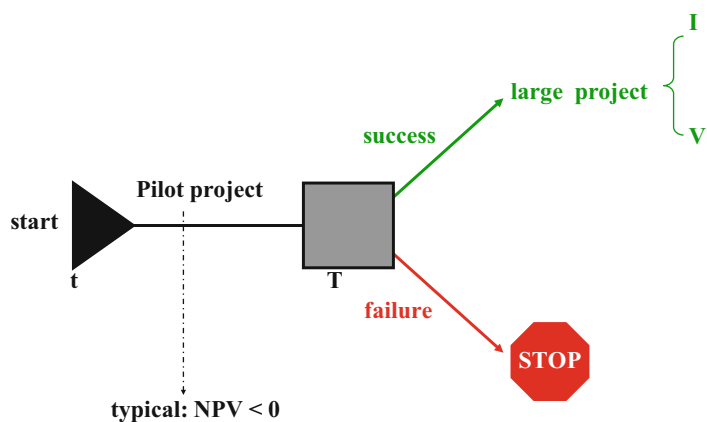
potential to compensate for the (likely) initial losses in the pilot phase. In the other case, the pilot project (and thus the entire project) should be rejected. Investors care about the value drivers of the growth option as well as the pilot project itself.

An example of a growth option is a US home decoration chain exploring the possibility to enter the French market. In order to explore the market potential for their product, the company decides to launch a pilot project with a cost of 110 million euro and 100 million euro expected net operating cash flows in present value terms. It is obvious that the pilot project as a stand-alone project is loss-making (-10 million euro) and should be rejected following the NPV criterion. However, if successful, assume the company plans to launch a large-scale commercialization project opening dozens of megastores across France. The follow-up project is expected to be launched after 2 years at a cost of 200 million euro. At this moment the present value of the operating cash flows of the follow-up phase is estimated to be 180 million. Although the present value of the cash flows is still lower than the investment cost at this moment, things could change over time. The volatility of project returns in this industry is estimated to be 25% per year. The risk-free interest rate is equal to 5%. Using a binomial model with 250 tree steps, the option value of the follow-up phase amounts to 25 million euro. Compared to the value of phase one of -10 million, it makes sense to invest in the pilot project as there is enough upside potential to justify investment. The total project value comes to $-10 + 25$ or 15 million euro. Whether the company will actually invest in phase two is only decided at the end of year 2 and will depend on the market conditions at that moment. For the moment, the company only commits itself to the pilot project, with the possibility for expansion at the end of year 2.
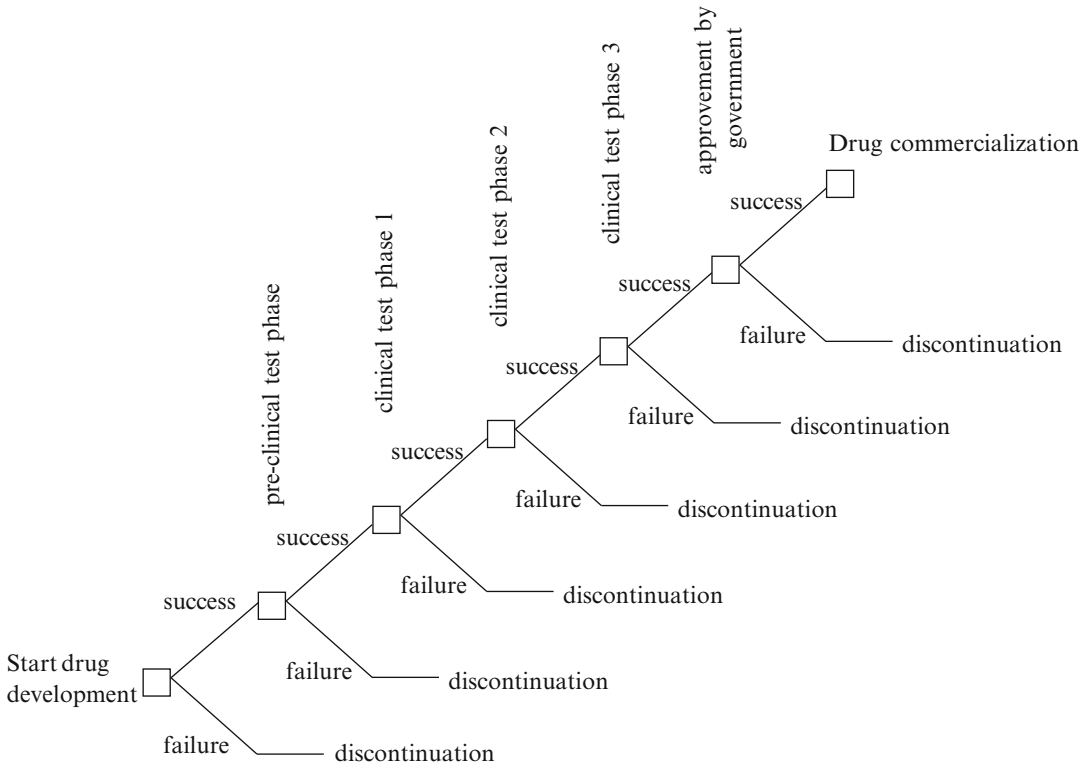
Sequential Option

When a growth option involves more than two phases, one has to enlarge the standard option approach to so-called sequential options, which can be valued using compound option techniques (Cassimon et al. 2011a). The option value of the second phase includes in this case also the option value of the subsequent phase. Put differently, in that case we have an option on an option or a compound option (Geske 1979).

A copybook case of a sequential option is the development of a new drug. A drug development pipeline consists of six distinct and specific phases (see Fig. 3). Developing a new drug is a chain of options starting with a preclinical test phase, followed by three clinical test phases, a governmental approval phase, and ultimately the commercialization phase. The initial R&D phase can be seen as an option on the preclinical test phase. If the initial R&D turns out to be successful, the preclinical phase is started; otherwise the research is being discontinued. The preclinical phase itself is an option on the first clinical test phase. If the preclinical tests are successful, the compound moves to the first clinical test phase; if not, the research is again abandoned. This phase is again an option on the next phase and so on, until the commercialization phase. This is a heavily regulated, standardized, and linear process because each phase is easily identified and has to be finished before the next phase can start. The initial R&D phase, being a sixfold compound option on the commercialization phase, can be valued using a generalized compound option model, such as the one by Cassimon et al. (2004), that was explicitly developed to value compound options of a higher order than two.

Option to Abandon

If market conditions deteriorate, management can also consider terminating and abandoning the project permanently. Having the option to realize a certain salvage value puts a floor to the potential losses of a project and thus adds value in comparison to the same project without this possibility. Management compares the project value as a going concern with the liquidation value the firm can realize upon termination of the project. This managerial decision can be interpreted and valued as a "put option," the right to sell an asset at a predetermined price at or up to a predetermined point in time (Myers and Majd 1990). The value of this put option should then be added to the project's traditional (NPV-type) value.

R

Real Options, Fig. 3 The development of a new drug as a sequential option

Operational Options

Operational options include options to expand, contract, suspend, and resume operations and the option to switch inputs or outputs during operation (Brennan and Schwartz 1985; Dixit 1989; Kulatilaka and Trigeorgis 1994). An example of a switch option is a chemical factory that builds in flexibility at the input or output side. At an additional cost, a company can decide to add input flexibility by building a factory that can switch from one energy source (say oil) to another energy source (electricity or gas). It allows companies to switch to cheaper energy sources during the project. This flexibility comes at a cost, which has to be compared with the value of the switch option. The company can also build in flexibility at the output side by building a factory that allows for various output products, e.g., switching from producing polyvinyl chloride (PVC) to polypropylene (PP) or polyethylene (PE). Again, balancing the value of the switch option to the

additional cost of building a flexible factory is at the core of the real option framework.

A shutdown and restart option assumes that a project does not have to be operated permanently. Depending on the net revenues and (marginal) costs, management can temporarily suspend operations and resume once net revenues again cover the (variable) cost of operation. In option terms, this means that management has the option to receive the project's net revenues minus the variable costs when the project is operated in a given year (Trigeorgis 2000). The value of the project in any given year is thus the maximum of that year's cash revenues minus that year's variable costs of operation or zero. Put differently, the project will be operated if and only if the revenue exceeds the variable costs. This limits the downside risk to the fixed costs, and therefore the project value should respond positively to increasing volatility in variable costs and in operating cash flows. Intuitively, all else equal, in more volatile environments, the

value of operational flexibility is higher (Sanders et al. 2013).

The option to scale up (expand) can be seen as a call option in a similar way as a growth option, while the option to scale down (contract) can be seen as a put option similar to an option to abandon.

Measuring Risk

One feature that all real option models have in common is that they require the input of an estimate of one or more sources of risk (proxying for uncertainty). In this contribution we focus on market risk (also labeled commercial risk) and technical risk.

Market Risk

Market risk is measured as the volatility of the project return between the current moment and the expiration date of the real option. It measures how much the project value, measured as the present value of all expected operating cash flows in the final phase (V), will vary over time. Real options only have value when things can change over time. The higher the volatility, the higher the change that tomorrow's world will materialize differently from what the decision-maker had in mind today. The estimation of the future volatility can be difficult when the amount of available data is limited. Sometimes nothing more than an educated guess is used. A "normal" range for volatility is about 30–40%. Often an educated guess is good enough as an input, especially if changes in volatility have little impact on the investment decision. Applying real option thinking compared to traditional valuation methods is often the key element; fine-tuning the volatility estimate often does not add a lot to insights. Sometimes a more precise estimate is required as the investment decision alters depending on the level of the volatility estimate. Cassimon et al. (2011a) give an overview of different proxies for volatility. A first approach is to use historical volatility derived from historical market data such as oil prices, commodity prices, real estate prices, and so on. A second approach uses volatilities of a sample of comparable firms. A third approach is the calculation of the implied volatility of options on a comparable firm as a proxy for the future volatility (Schwartz and Moon 2001). Finally, the use of internal company data is sometimes a good strategy. It is a viable approach if the firm has a portfolio of past and current projects, considered to be representative for the risk profile of the current project.

Technical Risk

While market risk, as captured by the volatility of the project return, refers to the normal business risk any company incurs, such as the potential market size, its expected revenues, its expected cost structure, and so on, technical risk refers to a catastrophic event (technical failure) that terminates the project and is unrelated to its cost or benefits. For instance, the uncertainty about the effectiveness or about potential problematic side effects of a new drug is an example of technical risk (Cassimon et al. 2011a). Such technical failure is the type of uncertainty that presents itself as a negative shock to the project value. Technical risk can be captured by a Poisson process (in case the nature of uncertainty is best characterized by discrete jumps) or by using discrete success-failure probabilities at each stage of the project.

Applications

Applications in General

Real option models to project evaluation are applied in a wide range of sectors, such as Internet companies (Schwartz and Moon 2001), the service sector (Jensen and Warren 2001), consumer electronics (Lint and Pennings 2001), pharmaceutical R&D (Cassimon et al. 2011a), the ICT sector (Cassimon et al. 2011b), and sustainable energy solutions (Sanders et al. 2013; Engelen et al. 2016).

Applications in Law and Economics

Some law and economics studies apply real option reasoning to enrich static models on modeling agent's behavior. For instance, Engelen (2004) extends the classic Becker expected utility framework on criminal behavior to provide a more dynamic decision-making framework of criminal activity. While conventional models of crime

focus on the expected net gain of a crime as the difference between the expected profits of a crime and the expected costs (i.e., the product of the amount of punishment and its probability (Engelen et al. 2016)), such a framework ignores the simultaneous existence of uncertainty, irreversibility of the criminal act, and flexibility in the timing when to commit the crime. If those characteristics are present, a criminal can delay committing the crime until more information about the uncertain future becomes available. Waiting some time to commit the crime might imply some risks and foregone profits, but it may prevent the criminal from being trapped in an irreversible crime, which may turn out to be very costly when being caught. Engelen (2004) shows that a crime that satisfies these three characteristics is best treated analogous to holding a financial call option. For some specific time period, a criminal has the possibility, but not the obligation, to pay a certain "price" in return for an asset that has some value. When the criminal decision is made, the option is exercised, which is an irreversible decision.

Cassimon et al. (2013) apply a criminal real option framework to criminal states. They study two episodes of criminal behavior by Rwanda in the Democratic Republic of Congo (DRC): the massive killing of Hutu refugees by the Rwanda Patriotic Army (RPA) in late 1996 to early 1997 and the illegal exploitation of Congolese resources from August 1998. They show how the international community can optimally intervene proactively, by reducing the incentives for criminal states to execute their criminal options.

While the above studies focus on handling uncertainty from an agent's point of view, other studies use real option modeling from a lawmaker's point of view. Deffains and Obidzinski (2009) apply the real option approach to the design of legal rules. Rulemakers face the choice between rule-based regulation and standard-based regulation. Detailed rules provide clear guidance to agents but are more costly to create ex ante and risk to become obsolete over time as market conditions vary. Standards are more flexible as they allow to adapt regulation more easily to the changing environment, but they are more costly in court

interpretation ex post as interpretation is more ambiguous. A real option framework shows that this choice depends on the variability of contingencies and on the degree of innovation in the area of the law. Adding the timing dimension and uncertainty to the classic trade-off between rule and standard allows to move from a static to a more dynamic perspective which is closer to real-life decision-making. In a similar vein, Parisi et al. (2004) analyze the value of waiting in lawmaking. Waiting to enact a certain law while collecting more information can be a better choice than being stuck in an ineffective or undesirable rule.

Lee et al. (2007) analyze the impact of bankruptcy law on entrepreneurial risk taking through a real option lens. They argue that society will benefit from more entrepreneur-friendly bankruptcy laws. Speedy bankruptcy procedures, discharging bankrupt individuals from debt, and automatic stay on assets will allow inefficient firms to exit more easily and will encourage potential entrepreneurs to enter the market without having to be afraid of the damaging consequences of a possible bankruptcy. Using a real option perspective, this study clearly shows the impact of the design of legal rules on entrepreneurial activity at the societal level.

References

Black F, Scholes M (1973) The pricing of options and corporate liabilities. J Polit Econ 81:637–659

Brennan M, Schwartz E (1985) Evaluating natural resource investments. J Bus 58:135–157

Cassimon D, Engelen PJ, Thomassen L, Van Wouwe M (2004) Valuing new drug applications using n-fold compound options. Res Policy 33:41–51

Cassimon D, Engelen PJ, Thomassen L, Van Wouwe M (2007) Closed-form valuation of American call-options with multiple dividends using n-fold compound option models. Finan Res Lett 4:33–48

Cassimon D, De Backer M, Engelen PJ, Van Wouwe M, Yordanov V (2011a) Incorporating technical risk into a compound option model to value a pharma R&D licensing opportunity. Res Policy 40:1200–1216

Cassimon D, Engelen PJ, Yordanov V (2011b) Compound real option valuation with phase-specific volatility: a multi-phase mobile payments case study. Technovation 31:240–255

Cassimon D, Engelen PJ, Reyntjens F (2013) Rwanda's involvement in Eastern DRC: a criminal real options approach. Crime Law Soc Change 59:39–62

Cox JC, Ross SA, Rubinstein M (1979) Option pricing: a simplified approach. J Financ Econ 7(3): 229–263

Deffains B, Obidzinski M (2009) Real options theory for law makers. Recherches économiques Louvain 75(1):93–117

Derivagem (2014) Option calculator. http://www-2.rotman.utoronto.ca/%7Ehull/software/index.html

Dixit A (1989) Entry and exit decisions under uncertainty. J Polit Econ 97(3):620–638

Engelen PJ (2004) Criminal behavior: a real option approach. With an application to restricting illegal insider trading. Eur J Law Econ 17(3):329–352

Engelen PJ, Kool C, Li Y (2016) A barrier options approach to modeling project failure: The case of hydrogen fuel infrastructure. Resource and Energy Economics 43:33–56

Feinstein S, Lander D (2002) A better understanding of why NPV under values managerial flexibility. Eng Econ 47:418–435

Geske R (1979) The valuation of compound options. J Financ Econ 7:63–81

Guerrero R (2007) The case for real options made simple. J Appl Corp Finan 19:38–49

Ingersoll JE Jr, Ross SA (1992) Waiting to invest: investment and uncertainty. J Bus 65:1–29

Jensen K, Warren P (2001) The use of options theory to value research in the service sector. R&D Manag 31(2):173–180

Kester W (1984) Today's options for tomorrow's growth. Harv Bus Rev 62(1):153–160

Kulatilaka N, Trigeorgis L (1994) The general flexibility to switch: real options revisited. Int J Finan 6: 778–798

Lee SH, Peng MW, Barney JB (2007) Bankruptcy law and entrepreneurship development: a real options perspective. Acad Manag Rev 32(1):257–272

Lint O, Pennings E (2001) An option approach to the new product development process: a case study at Philips electronics. R&D Manag 31:163–172

McDonald R, Siegel D (1986) The value of waiting. Q J Econ 101:707–728

Merton RC (1976) Option pricing when underlying stock returns are discontinuous. J Financ Econ 3(1): 125–144

Myers S, Majd S (1990) Abandonment value and project life. Adv Futur Options Res 4:1–21

Pindyck R (1988) Irreversible investment, capacity choice, and the value of the firm. Am Econ Rev 79: 969–985

Sanders M, Fuss S, Engelen PJ (2013) Mobilizing private funds for carbon capture and storage: an exploratory field study in the Netherlands. Int J Greenh Gas Control 19:595–605

Schwartz E, Moon M (2001) Rational pricing of internet companies revisited. Finan Rev 36:7–26

Trigeorgis L (2000) Real options and financial decision-making. Contemp Finan Dig 3:5–42

Trigeorgis L, Mason S (1987) Valuing managerial flexibility. Midl Corp Finan J 5:14–21

Further Reading

Amran M, Kulatilaka N (1999) Real options. Harvard Business School Press, Boston, 246 p

Dixit A, Pindyck R (1994) Investment under uncertainty. Princeton University Press, Princeton

Engelen PJ, Lander MW, van Essen M (2016) What determines crime rates? An empirical test of integrated economic and sociological theories of criminal behavior. Soc Sci J 53(2):247–262

Hull JC (2011) Options, futures, and other derivatives, 8th edn. Pearson, Upper Saddle River

Parisi F, Fon V, Ghei N (2004) The value of waiting in lawmaking. Eur J Law Econ 18(2):131–148

Trigeorgis L (1996) Real options. MIT Press, Cambridge, 427 p

Reasonableness

► Rationality

Refugee Law

► Asylum Law

Regulatory Competition

Katrin Gödker[1] and Lars Hornuf[2,3]
[1]School of Business, Economics and Social Sciences, University of Hamburg, Hamburg, Germany
[2]Department of Economics, Trier University, Trier, Germany
[3]CESifo, Max Planck Institut for Innovation and Competition, Munich, Germany

R

Abstract

Regulatory competition describes the activity of private or public lawmakers who intend to produce novel or alter current legislation in response to competitive pressure from other private or public lawmakers. In this chapter, we provide an overview of the legal arbitrage tactics of various entities, which are a necessary, though not sufficient, condition for

regulatory competition. Moreover, we investigate whether and how lawmakers respond to these endeavors by adapting their national corporate, insolvency, capital markets, and environmental law as well as product standards.

Defining Regulatory Competition

Regulatory competition describes the activity of private or public lawmakers who intend to produce novel or alter current legislation in response to competitive pressure from other private or public lawmakers (Hornuf and Lindner 2016). It is often private lawmakers, nation-states, regions, communities, and supranational organizations that engage in such competitive processes.

The literature distinguishes two forms of regulatory competition. First, Tiebout (1965) outlines a theoretical framework in which lawmakers offer a package of goods and services to legal entities under their jurisdiction. These legal entities can be individuals, companies, or other organizations recognized by law. In return for this package of goods and services, legal entities make tax payments. Unlike lawmakers, legal entities are mobile and spur the competitive process by physically moving to regions where legislators offer the best bundle of goods and services. Companies usually do this by moving their headquarters or by investing in production sites in the respective region. Typical bundles offered by lawmakers may encompass a certain physical and legal infrastructure, the latter of which includes, for example, specific taxes; corporate, bankruptcy, and environmental laws; and product safety and labor market standards.

Second, regulatory competition can also arise from unbundling certain legal rules from the physical location of a legal entity (Heine and Kerber 2002; Eidenmüller 2011). A possible constellation would be when a company locates its headquarter in the United States, adopts the company law of England and Wales, finances projects with debt securities under the law of the Cayman Island, and settles disputes in a Swiss court under French law. If the choice of law is independent of the physical location of a legal entity, this allows individuals and companies to cherry-pick the rules that are most suitable for their respective business transaction. Moreover, from an economic perspective, lawmakers that engage in this type of regulatory competition can better specialize in certain legal products and do not need to offer a complete bundle of laws to their customers.

The welfare implications of regulatory competition have been subject to a long-standing dispute in the law and economics literature. Most prominently, they were debated in the field of corporate law as unbundled competitive processes. While some scholars have persistently claimed that regulatory competition leads to the implementation of optimal legal rules, also known as the *race-to-the-top* hypothesis (see Winter 1977; Fischel 1982; Romano 1987), others have argued that regulatory competition leads to the prevalence of the lowest respective standards, also referred to as the *race-to-the-bottom* hypothesis (see Cary 1974; Bebchuk and Hamdani 2002). From a multi-level perspective, Sinn (1997) theoretically argues that when government regulation serves a purpose such as to overcome market failure and later becomes subject to competition on a higher regulatory level, regulatory competition again leads to economic inefficiencies.

Regulatory Competition in Corporate Law

In corporate law, conflict-of-law rules define whether legal arbitrage by companies in the respective jurisdictions is possible, which is a necessary, though not sufficient, condition for regulatory competition. Legal arbitrage can be understood as a legal planning technique that is carried out to avoid taxes and other legal rules to circumvent regulatory costs (Fleischer 2010). At the national level, legislators can apply either the real seat theory (*siège réel*) or the incorporation theory when dealing with foreign companies. After World War II, the real seat theory was most prevalent in Western Europe, practically prohibiting a free choice of law independent of corporate headquarters. Nevertheless, the mobility of companies has been a cornerstone of the

Single European Market, leading the European Court of Justice (ECJ) to interpret Art. 49, 54 TFEU (formerly Art. 43, 48 EC Treaty and, before that, Art. 52, 58 EEC), regarding cross-border company mobility. Starting with the Daily Mail (Case C-81/87, 27 September 1988) in 1988, the ECJ had largely abolished the real seat theory by the turn of the millennium, with the famous decisions on the Centros (Case C-212/97, 9 March 1999), Überseering (Case C-208/00, 5 November 2002), and Inspire Art (Case C-167/01, 30 September 2003) cases.

Regarding inbound cases, in which a foreign company seeks to immigrate into a certain jurisdiction, the ECJ found that companies registered under the law of their home member state had the right to transfer their head office to another member state. Unlike before, this could now be achieved without liquidating the original company and reestablishing a new legal entity. Consequently, the host member state must recognize the foreign company, which does not need to meet standards such as the minimum capital requirement for incorporation in this country. The founder of a company can thus choose a company law that best suits the business needs independent of the company's real seat. This rule largely paved the way for regulatory competition in the European Union (EU). Conversely, companies that intend to emigrate are still restricted by national legislation, as member states still have the power to prohibit such outbound cases. According to ECJ's Daily Mail (Case C-81/87, 27 September 1988), Cartesio (Case C-210/06, 16 December 2008), and National Grid Indus (Case C-371/10, 29 November 2011) decisions, home member states can require companies to have their registered office and head office under the national law of the respective territory. Otherwise, the company may need to be dissolved. Finally, the ECJ recently enabled existing companies to move their statutory seat to another jurisdiction in the Cartesio (Case C-210/06, 16 December 2008) and VALE (Case C-378/10, 12 September 2012) decisions of 2008 and 2012. Although such a transfer of the registered office necessarily leads to a conversion of the company into a company governed by the law of the new

member state, the company no longer must be dissolved.

How did national lawmakers react? Since 2003, not less than ten major company law reforms have been implemented in nine EU member states (Hornuf and Lindner 2016). Lawmakers in France (in 2003 and 2008), Hungary (in 2007), Germany (in 2008), Poland (in 2008), Denmark (in 2010), Sweden (in 2010), and the Netherlands (in 2012) were forced to reduce the minimum capital requirement for national legal forms, and many of these jurisdictions abolished the minimum capital requirement altogether. Seven years after the initial reform, Hungary decided to raise the minimum capital requirement back to the initial level. In some cases, lawmakers introduced a new legal form, abolished the notary requirement for setting up a company, or allowed for electronic company registrations and document filings. In almost all cases, the administrative speed of incorporation was increased. These factors were previously found to be the main drivers of legal arbitrage (Becht et al. 2008), and thus regulatory reforms might be considered a response to the competitive pressure exerted, mostly by the English Limited. Braun et al. (2013) show that the reduction of the minimum capital requirement helped countries not only improve the attractiveness of the national legal form but also increase entrepreneurial activities in general.

Unlike in Europe, where regulatory competition might also be driven by the pride of national lawmakers to offer the "regulation of choice," which fosters a prosperous private legal industry, the main objectives for US lawmakers to engage in regulatory competition and to create new company law rules is the ability to raise charter fees. Recently, approximately two-thirds of *Fortune* 500 companies and more than four-fifths of all new US initial public offerings chose to incorporate in Delaware (Bullock 2013). Although evidence shows that companies not incorporating in Delaware are subject to a home-state bias (Bebchuk and Cohen 2003), Delaware still collects approximately one-fourth of its overall tax revenues through business entity taxes and fees as well as Delaware Uniform Commercial Code fees (Bullock 2013). In Europe, such financial

incentives to engage in regulatory competition do not exist as the collection of charter fees is generally prohibited by EU legislation.

Not only does regulatory competition in corporate law take place *horizontally* between different US states or European nation-states, but it also occurs *vertically* between, for example, Canadian provinces and the federal lawmakers or national legislators and the supranational EU. In Europe, a supranational corporate law form was established with the Statute for a European Company (*Societas Europaea*, SE). Importantly, the European Company did not provide a full company law but rather refers some material matters to the national corporate law of the member states. Here, the scope for legal arbitrage emerges. While companies might adopt the European Company for various reasons, early evidence indicates that companies may choose the SE to freeze or renegotiate mandatory codetermination as well as to establish a one-tier board structure, especially if that was not possible under national corporate law (Eidenmüller et al. 2009). Fierce vertical regulatory competition in corporate law did not emerge until more recently. After reviewing the SE Statute in 2012, the European Commission noted that any benefits of a reform would not outweigh the potential challenges. Consequently, there was no intent to improve the competitive stance of the European Company. The proposal of a European private limited liability company (*Societas Privata Europaea*, SPE) faced opposition by some member states early on and so far has not been approved by the Council of the European Union.

Regulatory Competition in Insolvency Law

Insolvency laws in the EU are not harmonized; rather, individual jurisdictions keep their own national rules and proceedings. As a result, legal arbitrage activities of consumers and companies can theoretically spur regulatory competition. In the realm of personal insolvencies, consumers may shop, for example, for a shorter statutory discharge period. The discharge period can range from under 3 years in countries such as France, Latvia, Poland, or England and Wales and increase to at least 5 years such as in Austria and previously Germany (Drometer and Oesingmann 2015). Other variations in the insolvency regime concern the right of debtors to prevent a discharge because of misconduct on the borrower side, which may exist in some jurisdictions but not in others. From an economic perspective, shorter discharge periods spur consumption and support individual risk taking. By contrast, the prospects of a discharge also increase the moral hazard problem and weaken credit discipline (Adler et al. 2000). During the past decades, reforms in consumer insolvency laws did not, however, solely result from lawmakers engaging in regulatory competition; they are also a consequence of the growing over-indebtedness of consumers in general.

As in the case of personal insolvencies, a corporate insolvency proceeding under European rules is opened under the law of the debtor's center of main interests (COMI). According to the latest Insolvency Regulation Recast, the COMI is the place where the debtor conducts the administration of its interest on a regular basis and which is ascertainable by third parties. Given that almost one-fourth of the approximately 200,000 companies that experienced insolvency in Europe between 2009 and 2011 engaged in cross-border activities, some leeway emerged for them to engage in forum shopping. That companies indeed attempt to engage in forum shopping was prominently shown by the insolvency proceedings of Deutsche Nickel and Schefenacker. The head office of both companies was historically based in Germany; however, by merging or selling the company (partly) to a legal entity under English law, both companies attempted to move their head offices to Great Britain to start an insolvency procedure under English law. Under English rules, creditors can, for example, choose an insolvency administrator of their liking and benefit from extended procedural deadlines, and creditors do not need the consent of the previous owners to swap debt to equity. To the best of our knowledge, this form of legal arbitrage did not become a mass phenomenon, partly because of

legal uncertainty about whether such a move of the company seat is legitimate. While legal reforms in insolvency laws have recently taken place, there is no clear-cut evidence that they were the result of regulatory competition.

In the United States, lawmakers established a single federal bankruptcy code. Nevertheless, some scholars argue that judges still have a sufficient leeway to develop a state-specific approach to bankruptcy law (Skeel 1998) and that courts can apply state law, for example, to determine the fiduciary duties of managers (Skeel 2000). Moreover, LoPucki (2006) claims that judges are often motivated by the glamor of dealing with insolvencies of well-known companies, which brings about a better standing for them in the legal community. Moreover, bankruptcy bars exert pressure, which resulted in business activities moving to New York and Delaware (LoPucki and Kalin 2001). As only minor differences exist in the US bankruptcy code, forum shopping is often limited to large borrowers and Chapter 11 prepackaged bankruptcies (Enriques and Gelter 2007), in which debtors offer a plan to creditors, who then vote in its favor before a bankruptcy case is filed with the court.

Regulatory Competition in Capital Markets Law

Capital markets have unique features that facilitate regulatory competition (Ringe 2016). On the one hand, capital markets are essential for many economic activities and thus put substantial pressure on regulators to provide efficient laws. On the other hand, regulatory competition in capital market law emerges not only from issuers deciding for one regulatory regime from a range of options but also from issuers' cross-listing their securities in different markets across different jurisdictions. For example, a company in Angola could issue securities on the new Angola Stock Exchange and have additional disclosure standards imposed by the New York Stock Exchange. The number of companies listing securities outside their place of incorporation as well as the number of cross-listings has grown significantly, which has

resulted in increased competition between stock exchanges in the United States and Europe (Kim and Pinnuck 2014). A frequently mentioned reason for companies to cross-list is the so-called legal bonding to more rigorous disclosure standards to improve access to capital, which in turn lowers the cost of capital and increases the value of a company (Doidge et al. 2004). Coffee (2002) provides a detailed summary of research on the bonding theory.

The main challenge for lawmakers in formulating adequate regulatory instruments in the financial sector comes from the threat of negative consequences for financial stability (Ringe 2016). Thus, a global effort was made to achieve financial stability and has resulted in widespread attempts of harmonization. Worldwide, the most prominent example is the process of harmonizing banks' capital requirements by the Basel Accords of the G20 group. Moreover, in the aftermath of the financial crisis, the EU and its member states have strengthened capital market regulation as well as supervision and prioritized regulatory convergence over regulatory competition in the financial sector. The Capital Markets Union, a recent initiative of the European Commission, aims to create a single market for capital across all EU member states by removing barriers to cross-border investment. Against the backdrop that issuers want to reach capital providers, investor protection regulation also plays a central role in harmonizing capital markets law. For example, the European Markets in Financial Instruments Directive is a strong step forward in converging regulation regarding securities trading in the EU.

As in the other domains, the question has been raised whether regulatory competition in capital market law is likely to yield a race to the top or a race to the bottom. In line with the legal bonding theory, substantial evidence shows that countries with more disclosure requirements and more stringent corporate governance rules provide a more attractive capital market environment with lower cost of capital for listed companies (Prentice 2002). This should motivate countries to raise their disclosure and governance standards to attract more company listings. However, Prentice (2005) notes that in capital markets, no true

R

competition emerges and that a race to the bottom is more likely because the choice of listing is not made by companies but by self-interested managers. In addition, some scholars focus on regulatory competition among security exchanges and note that this competition does not necessarily yield a race with respect to listing standards but will more likely result in an endogenous segmentation of the capital market for listings with first-tier and lower-tier market segments (Chemmanur and Fulghieri 2006).

Regulatory Competition in Environmental Law

From a political economy perspective, environmental policy making results from the interaction between lawmakers and various interest groups. These interest groups demand different environmental measures and put pressure on lawmakers to decide in their favor (Oates and Portney 2003). For example, voters who call for stricter pollution regulation can threaten governments to withdraw their support during the next election. In this context, the debate also targets the extent to which the implementation of new regulatory instruments is influenced by well-organized interest groups, such as producers and consumers.

Yet, taking international trade into account, it is argued that when states are confronted with economic competition, they have an incentive to adopt lax environmental standards to attract companies and capital, which leads to a race to the bottom of environmental standards (Engel 1996). Regulatory competition would then result in a reduction of environmental protection efforts to the level of the least stringent state. One main reason for this trend is the presence of excessive market power of the industry (Engel 1996).

However, there is no clear indication that environmental regulatory competition necessarily leads to the lowest possible standard to prevail. There might also be a weaker form of the race-to-the-bottom tendency, in which only some states lower their environmental standards under the competitive pressure, and thus not all states converge to the least stringent state (Konisky 2007).

Moreover, Vogel (1997) postulates that the existence of more stringent environmental standards in one country could even trigger a race to the top as companies in other countries want to export their goods and services to the high-standard country and thus must adopt the more stringent environmental standards (the so-called California effect). To avoid the costs of double regulation, companies might lobby their governments to regulate specific environmental issues in accordance with the high-standard countries that exports target. Indeed, an empirical investigation shows that even before the EU adopted a directive regarding a specific environmental regulation instrument, a diffusion process had begun, kicking off a race to the top among member states (Holzinger and Sommerer 2011).

Finally, more environmental standard setting is implemented and harmonized at the international and supranational level. This can be expected to further increase, for example, under the auspices of the United Nations' Paris Agreement, in which 195 nations agreed to undertake ambitious efforts to combat climate change. With accelerating internationalization of environmental regulation, the opportunities to differentiate and compete between single regulators might vanish. Heyvaert (2013) argues, however, that sufficient scope for decentralized regulators remains to implement differential environmental regulation, particularly because only few international environmental standards are truly global and there is also flexibility within transnational regimes.

Regulatory Competition in Product Standards

Consumers are directly affected by regulatory competition when it comes to product standards. Building on Akerlof's (1970) theory of adverse selection, Sinn (1997, 2003) argues that consumer markets are characterized by information asymmetry between consumers and sellers because consumers cannot fully elicit product qualities. This is especially relevant for products whose quality is not likely to be detected because they are not frequently purchased or their value is too

low to justify intensive information gathering. This information asymmetry can lead to low-quality equilibrium in which informed sellers oversupply low-quality products and undersupply high-quality ones. To reduce the negative consequences of such market failures, regulators specify minimum product standards.

Thus, governments intervene where markets have failed. Yet regulatory competition can emerge as countries engage in protectionist practices by undercutting product standards of competing countries to give their own industries a competitive advantage. According to Sinn (1997), the erosion of product standards could follow this activity and reduce consumer protection. In this vein, the recent effort in implementing international trade and investment partnerships across the world is of particular importance. Free trade agreements such as the Transatlantic Trade and Investment Partnership promise strong positive welfare implications through the repeal of non-tariff barriers and the harmonization of standards that act as barriers to trade. However, in particular the harmonization of quality standards resulted in public uprising because people feared that the new product standards could not meet pervious national consumer protection preferences.

In the EU, a new era of European competition began with the Cassis-de-Dijon (Case C-120/78, 20 February 1979) decision (Sinn 2003). The ECJ held that a regulation applying import restrictions to a product legally produced in one of the EU member states was an unlawful restriction on the free movement of goods. The goal of this judgment was to prevent protectionism of national governments. However, if consumers are unable to distinguish different national quality standards of a product, this judgment could result in Europe settling at an equilibrium with inefficiently low product standards (Sinn 1997). Thus, considering that regulatory competition is not efficient, Sinn (2003) contends that more centralized actions in the EU should be considered. In this sense, a central supervisory authority that supervises product quality from a consumer protection perspective would be helpful – as in the case of the US Food and Drug Administration.

Summary and Outlook

Regulatory competition in the spirit of the Tiebout (1965) model today is a widespread phenomenon on the regional, national, and global level. Lawmakers permanently attempt to direct individuals, companies, and capital to their home jurisdictions by changing their applicable law and infrastructure vis-à-vis those in other countries. While this process often improves the conditions for legal entities to conduct business and other operations, in certain situations it might also lead to a race to laxity. Regulatory harmonization might then be the policy tool of choice and is, for example, argued to foster financial stability in capital markets. Yet, the so-called Brexit vote, in which the citizens of Great Britain recently decided to leave the EU, can be interpreted as an attempt to flee European harmonization and become more flexible to engage in regulatory competition again. The UK prime minister, for example, already endorsed a move by the previous conservative government to reduce the corporate tax rate, not least to attract foreign companies. However, the introduction of regulatory uncertainty in other areas of the law could backfire, especially if legal entities prefer regulatory certainty to more benevolent legal rules. Thus, future research might investigate the trade-off between the benefits of harmonization and regulatory competition, how nation-states and supranational organizations should optimally position themselves in a multi-level setting such as the EU, and which welfare effects the various actors can expect.

With regard to regulatory competition in the form of unbundling of legal rules, the debate among US scholars largely ended in the 1990s, with some scholars proclaiming that the regulatory race is a "race to nowhere in particular" (Bratton 1994, p. 401). As such, regulatory competition at the US state level has frequently led to desirable results but has also been shown to have mixed effects for shareholders such as in the case of takeover legislation (Romano 1992). In Europe, the debate is not entirely solved yet.

Although we attempted to draw a comprehensive picture of the regulatory competition literature, many areas could not be covered because of

R

the limited scope of this chapter. Researchers have inter alia also investigated regulatory competition in the domain of marriage law, the legal process and arbitration procedures (O'Hara and Ribstein 2009), as well as competition law (Gabor 2013).

References

Adler B, Polak B, Schwartz A (2000) Regulating consumer bankruptcy: a theoretical inquiry. J Leg Stud 29:585–613

Akerlof GA (1970) The market for "lemons": quality uncertainty and the market mechanism. Q J Econ 84(3):488–500

Bebchuk L, Cohen A (2003) Firms' decisions where to incorporate. J Law Econ 46:383–425

Bebchuk L, Hamdani A (2002) Optimal defaults for corporate law evolution. Northwest Univ Law Rev 96: 489–519

Becht M, Mayer C, Wagner H (2008) Where do firms incorporate? Deregulation and the cost of entry. J Corp Finan 14:241–256

Bratton W (1994) Corporate law's race to nowhere in particular: the genius of American corporate law by Roberta Romano. Univ Tor Law J 44:401–440

Braun R, Eidenmüller H, Engert A, Hornuf L (2013) Does charter competition foster entrepreneurship? A difference-in-difference approach to European company law reforms. J Common Mark Stud 51:399–415

Bullock J (2013) Delaware division of corporations, 2013 annual report. http://corp.delaware.gov/Corporations_2013%20Annual%20Report.pdf

Cary W (1974) Federalism and corporate law: reflections upon Delaware. Yale Law J 83:663–705

Chemmanur TJ, Fulghieri P (2006) Competition and cooperation among exchanges: a theory of cross-listing and endogenous listing standards. J Financ Econ 82(2):455–489

Coffee JC Jr (2002) Racing towards the top? The impact of cross-listings and stock market competition on international corporate governance. C Law Rev 102: 1757–1831

Doidge C, Karolyi GA, Stulz RM (2004) Why are foreign firms listed in the US worth more? J Financ Econ 71(2):205–238

Drometer M, Oesingmann K (2015) Household debt and the importance of effective private insolvency laws. CESifo DICE Rep 2:63–66

Eidenmüller H (2011) The transnational law market, regulatory competition, and transnational corporations. Indiana J Glob Stud 18:707–749

Eidenmüller H, Engert A, Hornuf L (2009) Incorporating under European law: the Societas Europaea as a vehicle for legal arbitrage. Eur Bus Org Law Rev 10:1–33

Engel KH (1996) State environmental standard-setting: is there a race and is it to the bottom? Hastings Law J 48:271–398

Enriques L, Gelter M (2007) How the old world encountered the new one: regulatory competition and cooperation in European corporate and bankruptcy law. Tulane Law Rev 81:577–646

Fischel D (1982) The "race to the bottom" revisited: reflections on recent developments in Delaware's corporation law. Northwest Univ Law Rev 76:913–945

Fleischer V (2010) Regulatory arbitrage. Texas Law Rev 89:227–272

Gabor B (2013) Regulatory competition in the internal market: comparing models for corporate law. Securities law and competition law. Edward Elgar, Cheltenham

Heine K, Kerber W (2002) European corporate laws, regulatory competition and path dependence. Eur J Law Econ 13:47–60

Heyvaert V (2013) Regulatory competition: accounting for the transnational dimension of environmental regulation. J Environ Law 25(1):1–31

Holzinger K, Sommerer T (2011) "Race to the bottom" or "race to Brussels"? Environmental competition in Europe. J Common Mark Stud 49(2):315–339

Hornuf L, Lindner J (2016) The end of regulatory competition in European corporate law? In: Wettbewerb der Gesellschaftsrechtsordnungen in Ostmitteleuropa?. Nomos, Baden-Baden, pp 117–138

Kim O, Pinnuck M (2014) Competition among exchanges through simplified disclosure requirements: evidence from the American and global depositary receipts. Account Bus Res 44(1):1–40

Konisky DM (2007) Regulatory competition and environmental enforcement: is there a race to the bottom? Am J Polit Sci 51(4):853–872

LoPucki LM (2006) Courting failure: how competition for big cases is corrupting the bankruptcy courts. University of Michigan Press, Michigan

LoPucki LM, Kalin SD (2001) The failure of public company bankruptcies in Delaware and New York: empirical evidence of a "race to the bottom". Vanderbilt Law Rev 54:231–282

O'Hara E, Ribstein L (2009) The law market. Oxford University Press, Oxford

Oates WE, Portney PR (2003) The political economy of environmental policy. Handb Environ Econ 1:325–354

Prentice R (2002) Whither securities regulation? Some behavioral observations regarding proposals for its future. Duke Law J 51:1397–1511

Prentice RA (2005) Regulatory competition in securities law: a dream (that should be) deferred. Ohio State Law J 66:1155–1230

Ringe WG (2016) Regulatory competition in global financial markets: the case for a special resolution regime. Annals Corp Gov 1(3):175–247

Romano R (1987) The state competition debate in corporate law. Cardozo Law Rev 8:709–757

Romano R (1992) A guide to takeovers: theory, evidence, and regulation. Yale Regul 9:119–179

Sinn HW (1997) The selection principle and market failure in systems competition. J Public Econ 66:247–274

Sinn HW (2003) The new systems competition, Yrjö-Jahnsson lectures. Wiley-Blackwell, Oxford

Skeel DA (1998) Bankruptcy judges and bankruptcy venue: some thoughts on Delaware. Del Law Rev 1:1–45

Skeel DA (2000) Lockups and Delaware venue in corporate law and bankruptcy. Univ Cincinnati Law Rev 68:1243–1279

Tiebout C (1965) A pure theory of local expenditures. J Polit Econ 64:416–424

Vogel D (1997) Trading up and governing across: transnational governance and environmental protection. J Eur Publ Policy 4(4):556–571

Winter R (1977) State law, shareholder protection and the theory of the corporation. J Leg Stud 6:251–292

Regulatory Impact Analysis Meets Economic Analysis of Law: Differences and Commonalities

Wolfgang Weigel
Faculty of Business, Economics and Statistics, Department of Economics, Joseph von Sonnenfels Center for the Study of Public Law and Economics, Vienna, Austria

Definition

Regulatory Impact Assessment is a tool for law-making, which makes use of economic criteria and techniques, such as Pareto-efficiency and cost-benefit analysis. It has been developed from the mid-seventies of the twentieth century and until now is in use worldwide, mainly pushed by OECD and the European Union. RIA reflects pragmatism.

The economic analysis of law, although having early roots in Europe at the age of enlightenment, has become a worldwide renown scientific approach and a vast field of interdisciplinary research at the intersection of economics and the law. It meets highest standards of sophisticated research and at the same time serves as methodology for policy recommendations.

Wolfgang Weigel has retired.

For decades the two fields developed without explicit reference to each other. So the question emerges, what they have in common and what are the differences. This is shown and complementary use is advocated.

What's Up?

In this entry it is shown what "Regulatory Impact Assessment" has in common with the economic approach to the law or "law and economics." Intuitively, "regulation" and "laws" have a common scope. Moreover, they can be treated with the same tool: economics. But what makes them differ? For one it is the history of origins; this is remarkable inasmuch most of the time, there are no mutual references! Secondly it is in the purpose and thirdly in the range. While laws form the molecules of the judicial framework of every society, regulation is seen to form an essential part of economic policy making. However, in the influential view of the Organization for Economic Cooperation and Development (OECD) regulatory impact assessment – RIA for short – takes a much wider stance than the law inasmuch it is a tool, which meanwhile even by scholars of the doctrine of law-making (Gesetzgebungslehre) is acknowledged as the most comprehensive among the tools for the accomplishment of their task (Schäffer 2007)! But how does this fit into the observation that with respect to economics RIA seems essentially to rest on cost-benefit-analysis and little else, while the economic analysis of law makes use of the full range of microeconomic theory. Still there is a bracket around these which is welfare economics and a more comprehensive approach named new institutional economics, to be outlined later.

In order to elaborate on the commonalities and differences of RIA and Law and Economics, in the entry I proceed as follows: section "The Notion of "Regulation" and the Focus of "Regulatory Impact Assessment"" deals with the notions of "regulation" as well as "regulatory impact assessment" (RIA for short), a brief history of RIA and distinct properties. It follows a refresher of the approach of the economic analysis

R

of law (EAL) in section "A Bird's Eye View of the Economic Analysis of Law," the core- chapter on the comparison (section "The Overlap"), followed by a brief outlook (section "Outlook").

The Notion of "Regulation" and the Focus of "Regulatory Impact Assessment"

Regulation

It is important to note that the term "regulation" here is not meant in the narrow sense of imposing government constraints on private undertakings alone!

In fact, regulation is understood as a particular kind of incentive mechanism, namely, a set of incentives established either by the legislature, government, or public administration that mandates or prohibits actions of citizens and enterprises. Regulations are supported by the explicit threat of punishment for noncompliance (ideas on which scholars of EAL definitely will perfectly agree).

Finally, regulation here includes the full range of legal instruments and decisions – constitutions, parliamentary laws, subordinate legislation, decrees, orders, norms, licenses, plans, codes, and often even "grey" regulations such as guidance and instructions. Note that this view of regulation contrasts to the usual and somewhat narrower understanding of regulation as, for example, in Ogus (2004).

And when President Barack Obama made Cass Sunstein of Harvard head of the Office of Information and Regulatory Affairs (OIRA), even "nudging" became part of the regulatory arsenal. Here, nudging refers to means, by which people are gently induced to make appropriate decisions or act in a specific way. No explicit constraints are used and no particular enforcement mechanisms.

The instrumental use of regulation is closely tied to "market failures." From existing manuals by OECD and from instructions provided through several US-presidents' executive orders, the following list emerges:

- Monopolies and natural monopolies
- Information Inadequacies
- Continuity and availability of services
- Anticompetitive behavior and predatory pricing
- Moral hazard in the presence of public goods
- Unequal bargaining power
- Scarcity and rationing
- Distributional justice and social policy
- Rationalization and coordination
- Planning
- Myopic behavior

One important observation regarding the use of regulation must be stressed here: Public policies can be classified as "resource" – intensive and as "regulation" – intensive. To illustrate: A government may intend to cut carbon-dioxide-emissions by the reduction of exhaust-fume of cars. This can readily be pursued by an order, stating that car-owners are obliged to prove installation of the most advanced catalytic converter in the car by the end of the year. This would be at the cost of the owners and just leave enforcement costs with the government. However, we could imagine that government wants to make sure that the task is accomplished with minimum delay and allocate a certain amount out of the budget for the installation of the devices. This truly would be a resource-intensive undertaking. So with respect to public policy, spending and regulation are substitutes here!

However, since spending programs by the rule of law must rest on a law, the view put forward above requires some "metatheory of regulation," which conveys the rationale for an initial framework of some order. As will be pointed out a little later, "new institutional economics" could serve as such metatheory.

Having investigated the notion of regulation, it is now time to turn to.

Regulatory Impact Assessment

A RIA is simply a way of gathering and organizing information about the expected impacts of a law or regulation and its major feasible alternatives. (Morrall 1994, p. 3, see also this Encyclopedia, Lanneau, R., "Regulatory Impact Analysis")

"The purpose of RIA is to improve the quality of government interventions. It operates on familiar

principles and seeks first to ensure that the impacts both intended and unintended of proposed legislation and regulations are assessed in advance, and form an input into decision-making. RIA begins by answering the questions: Will the proposed intervention actually cause welfare to increase? What are the economic effects, i.e., how do the benefits stack up against the costs?" "Next, RIA highlights the strictly redistributive impact of proposed government intervention and establishes precisely who wins, who pays and how much" (Quotations from manuals on RIA by OECD 1997a).

Basically, a RIA has two underpinnings, one being an almost exhaustive checklist for regulatory undertakings and the second a rigorous cost-benefit analysis. The gist of the checklist is the following (Council of the OECD 1995):

1. Is the problem correctly defined?
2. Is government action justified?
3. Is regulation the best form of government action?
4. Is there a legal basis for regulation?
5. What is the appropriate level (or levels) of government for this action?
6. Do the benefits of regulation justify the costs?
7. Is the distribution of effects across society transparent?
8. Is the regulation clear, consistent, comprehensible, and accessible to users?
9. Have all interested parties had the opportunity to present their views?
10. How will compliance be achieved?

This list obviously requires typical considerations rooted in economic analysis, such as looking for alternatives and their consideration, as well as cost benefit analysis (see this Encyclopedia, Torriti, J., "▶ Cost–Benefit Analysis"). Moreover, it stresses procedural rules (cf. point 9) as well as typical issues of compliance and enforcement, respectively (cf. point 10) (which are, almost needless to say, considerations most familiar to the scholar of the economic analysis of law).

Ultimately, each of these questions requires treatment of the following steps: An analysis of the status quo as well as the need of intervention, an analysis of alternative ways to come to grips with a problem, including consultations and the collection of information. From this the most preferred action should emerge, depicted in adequate measures, which then allow drafting (Renda 2010).

The generality of the procedures conveys a hint as to why in the doctrine of law-making RIA has such a prominent stance.

From First Oil-Crisis to Smart Regulation: A Very Brief Look on the History

After the oil-price-shock of 1974, the Ford-administration initiated measures to stabilize the economy with primary concern about inflation and employment. To this end, all regulations had to be checked for their effectiveness and subsequently reconciled with the "office of management and budget." So in the very beginning it was a device to check macropolicies. However, it were the frictions in the implementation of the policies, which were the primary focus of said checks! The respective attempts appear to have been quite promising. Consequently the first executive order regarding the systematic use of RIA was enacted by President Reagan 1981, (Order 12291). There one could read: "Regulatory action should not be undertaken unless the potential benefits to society for the regulation outweigh the potential costs to society ... Regulatory objectives shall be chosen to maximize the net benefits to society."

While RIA enjoyed changing popularity in subsequent years, it received stimulation from a study by Hopkins (1996), who shows that the aggregate compliance cost from federal regulation borne by the private sector and territorial authorities amounted to US $ 668 billion or approximately 10% of GDP in 1995. This was, when the struggle against frictions in the economy due to flaws in regulation started, aptly illustrated by the upswing of the "office of information and regulatory affairs," founded by President Clinton through executive order 12866, which quickly reached 40 permanent staff.

Whereas several countries outside the USA fairly early adopted RIA, the boost came from an initiative of (OECD 1997b) regarding "transition economies," culminating in the program SIGMA (Support for Improvement in Governance and Management in Central and Eastern European

R

Countries) and PUMA (Public Management Service). Via OECD it entered the EU, where it first was adopted under the label "less and better regulation" which has muted to "smart regulation" meanwhile, being widely used, as can be seen from an ever increasing number of studies on http://ria-studies.net/en (cf Renda 2010).

Where Hope Lies There Is Also Disappointment

RIA for sure corresponds to the claim of a comprehensive approach. It meets several demands to a tool of law-making, the most prominent being lucidity and traceability, flexibility, and consistency. Moreover, it meets technical standards of lawmaking such as terminology and the allocation of competences, but also standards of implementation, such as practicality, feasibility, enforceability, but also acceptance.

The most prominent features are however those of economic efficiency as well as effectiveness, where the former is enhanced by cost-benefit analysis as the economic core of the tool. In a nutshell, the basic structure of every CBA is to secure that $B(x) - C(x) \geq 0$, where B are the (aggregated social) benefits (appropriately measured) of an act such as lowering/increasing the degree of regulation to some desired level x and C are the (social) costs. In the case of a continuous variation of x the criterion requires that $\partial B/\partial x = \partial C/\partial x$, constraints and contingencies notwithstanding.

The benefits B, accruing from some project (level of regulation) x, are captured by the (consumer) surplus brought about at prevailing (imputed) price of some regulations.

The basic structure of CBA is structurally equivalent to the Kaldor–Hicks test, which means that ostensibly there is a rigorous criterion for the selection of solutions to a regulatory agenda. However, one has to be cautious here for at least two reasons.

Leaving the tool itself unquestioned, the Kaldor–Hicks test itself has a serious weakness in its distributional ambiguity: To illustrate, assume that the benefits from some environmental measures go to a densely populated area, while the (opportunity) costs are borne by taxpayers. Then the aggregated individual benefits may be equally distributed among the beneficiaries. But assume now that the beneficiary is a single entrepreneur owning the large parcel of land, which will increase in value to the level B. Such effect makes the beneficiary in a sense privileged, although the criterion for potential compensation still holds.

But there is a still harder objection: CBA carried out lege artis follows a couple of strict assumptions rooted in neoclassical microeconomics. And it is held that in many cases these could – or should – not be applied, which can easily be seen from the increasing number of deviations from neoclassical results brought about by "behavioral" and "experimental" economics, respectively (Camerer et al. 2011)

It is worth mentioning here that in the EU a "better regulation package" was released in May 2015, which partly took account of the methodological weaknesses just pointed out.

With respect to the relatedness to the "economic analysis of law," the following features of RIA should be recalled:

RIA is definitely rooted in Paretian welfare economics (see the citation from President Reagan's executive order, supra)

Closely related to the latter is "methodological individualism"

RIA takes a weak "consequentialist" view. This can be inferred from the OECD-checklist (supra), which implicitly at least asks for ethical or moral justifications. Moreover, the questions regarding distributive issues as well as the comprehension of affected groups underline this view inasmuch they point to certain underpinnings regarding standard perceptions of a society.

Before some commonalities and differences are pointed out, a view on the "economic analysis of law" (EAL) is due.

A Bird's Eye View of the Economic Analysis of Law

Given the broad understanding of RIA in the view of OECD (which is shared by the EU), one may ask, if in law and economics the notion of a "law" might have a different meaning here than in the

concept of RIA. Well, upon inspection of some definitions of a law, one does not get a clear idea. Here are just two tasters:

"A rule of conduct or procedure established by custom, agreement, or authority" or "A statute, ordinance, or other rule enacted by a legislature."

Both give rise to similar implications: it is not the "nature" of the legal rule which is at stake, but the way of formation through a distinct procedure.

This is, why the law eventually is contrasted to "norms" and "standards," as, for instance, in a well known article by Michael Adams (2002). The latter are seen as outcomes of voluntary agreements (within an industry, say) or collective action of some kind, as in the exceptional book on "social institutions" by Schotter (1981).

This notwithstanding, the legislature might have some discretion in choosing the rule, which is established, provided it is backed by the super-ordinate legislature.

Unfortunately, the domain of the economic analysis of law appears to be slightly broader than that (in the meantime). Recall that sometimes – and especially with respect to inter-national law – it is referred to "soft law" (Gersen and Posner 2008).

So summarizing "law" and "regulation" do overlap to a considerable extent with respect to the domain.

What about the scope of analysis?

In contrast, look at this: "Economic analysis of law seeks to answer two basic questions about legal rules. Namely, what are the effects of legal rules on the behavior of relevant actors? And are these effects of legal rules socially desirable?" (Kaplow and Shavell 2002, p. 1661), and one must add: how can they be improved so as to meet the measures of social efficiency?

Since the law guides the legislature, the executive branch, as well as the judiciary, the domain of the approach is all-encompassing.

In pursuing its purpose, the approach follows

- Paretian welfare economics
- In particular a methodological individualism
- Most of the time assuming rationally deciding people ("homo oeconomicus")
- And a consequentialist view.

However, the quickly emerging psychology-prone contributions appear to lead to an erosion of both, the rationality-assumption and conse-quentialism, since the patterns guiding judgement as well as decision are more and more coming to the fore.

The Overlap

Before looking at the commonalities, one remarkable detail in the history of RIA is worth stressing: Looking at the publications dealing with RIA and as mentioned in the intro-duction most of the time, there is no reference whatsoever to the economic approach to law (and vice- versa!). To assure oneself, one might consult the OECD's website on this issue, but this would be in vain! One thus gets the impression that the approach neglects the many valuable insights from an economic anal-ysis of law regarding incentives of people in any social role, consumers, entrepreneurs, pol-iticians, bureaucrats, judges, mothers, thieves, whatever, despite the fact that regulation is considered an "incentive mechanism" (supra, at section "Regulation").

However, while after first inspection, the main tool of RIA is identical with the main tool of EAL, evidently there are considerable differ-ences which come to mind immediately. The most important of these differences seems to be that in the course of a RIA typically no analysis is undertaken, of how a single represen-tative individual would react to a norm; that is to say, how this person would calculate expected benefits and expected cost, so as to make the inherent incentives and likely transaction costs (broadly defined) of some regulation more visible. Instead, an aggregate measure is sought right away.

Now it is beyond the scope of this note to treat the steps of a RIA in detail. However, some of the requirements, as laid down in several guidelines as well as the Clinton Directive (Executive order 12866), deserve mention:

One such requirement is the "statement of need," which is supposed to justify government

R

intervention (a list of reasons for regulation has been given above).

Moreover, the possibility of "over-regulation" due to preceding rent-seeking must be stressed here, which, in terms of economic analysis of law, can be seen as a treatment of malfunctions of a law, thus fitting into the list of purposes according to Kaplow and Shavell (supra).

But from time to time RIA appears to be even a kind of extension of the domain of the economic analysis of law (EAL). The importance and the relevance of EAL lies in the general and robust theoretical results, e.g., regarding incentives of all kinds (e.g., regarding liability rules vs. property rights or different kinds of punishment and so on). In contrast and taking a normative stance, the aforementioned directives point out that different standards of safety and quality of commodities are legitimate according to specific demands; even the legitimacy of barriers to entry for distinct professions is stressed, one example being pilots.

Consequently, what scholars of EAL would discuss under the label of "alienability" of property rights is addressed. Property rights here are understood as "sanctioned behavioural relations among men that arise from the existence of goods and pertain to their use" (Furubotn and Pejovich 1974, p. 3).

From such considerations to the emphasis to analyze alternative structures of property rights (institutions), it is just a fairly small step. To illustrate: the Clinton directive requires to take into account lawsuits and taxation as alternatives to regulatory measures.

One advantage of EAL over RIA definitely is the explicit consideration of transaction costs (on the notion: this Encyclopedia, Vereeck, L. et al., Transaction Costs). Recall that these costs are seen as the obstacles to the internalization of externalities. Therefore, they cannot be grasped as indirect cost or stemming cost within the typical classification of a cost-benefit analysis. They are, on the contrary, instrumental to such costs: To illustrate: Where clarification of property rights will not work, transaction costs suggest clear guidelines, which then allow for bargaining in the shadow of the law.

Moreover, RIA seems to abstract entirely from the role of courts, an issue, on which EAL has a lot to say. Bearing in mind that RIA is embedded in the broader concept of regulatory reform, which in turn is summarized by the guidelines stated in section "Regulatory Impact Assessment" above. Upon inspection, one learns that in some respect, these guidelines advocate a partial approach: while it is recommended to ask, whether regulation was the appropriate form of government intervention, it is not explicitly recommended to consider alternative institutional settings (as first suggested by Ronald Coase in his seminal 1960-article).

Now it is definitely true that EAL might be less conclusive on the aggregate level than RIA: This might follow from a typical way of reasoning within the law and economics framework: Frequently, the generalized consequences for resource allocation emerging from the way in which a judge handled a particular case are at stake. The famous "Learned Hand" formula may serve as an illustrative example (forming part of the set of robust results pointed out above). Here, the problem at hand – the liability of the "cheapest cost avoider" – is worked off by induction, that is to say by the generalization of considerations in the course of handling the case United States v. Carroll Towing Co (159 F.2d 169 [2d Cir. 1947], excellent description of the case in Cooter and Ulen 1988, p. 360 passim). RIA, with its flavor of pragmatism, takes a different approach. However, given the broad definition and the subtle claim of the more recent development of RIA (see section "Regulatory Impact Assessment," supra), one wonders why there is so little mentioning of, e.g., incentives and the presence of obstacles to action (i.e., transaction costs).

Maybe that the evasion of such subtleties is the price one has to pay for the explicit intention of OECD to provide a tool for a standardized treatment of a very broad range of issues.

Such observations open out into the question, whether RIA and EAL are not so much two fields with a common overlap, but rather closely related branches of a common approach, which might be labeled "new institutional economics" (see this Encyclopedia, Randla, R., " ▶ Institutional

Economics"). As an underpining of the institutionalist view of the economy, one may recall George Stigler here. In his Presidential Address at the occasion of the 1964(!) meeting of the American Economic Association he stated: The competence of economists "...consists in understanding how an economic system works under alternative institutional frameworks," and one is tempted to say: consequently: "The basic role of the scientist in public policy, therefore, is that of establishing the costs and benefits of alternative institutional arrangements."

Although it is not an easy task to give a definition of such a broad term as "institution," it ought to be outlined at least. An Institution is a system of formal and/or informal rules, which by consent guides human actions in a particular way and contains remedies for enforcement. Furubotn and Richter (1997) offer a comprehensive view on this approach. So very briefly, what is (new) institutionalism about? Economics traditionally deals with decisions over scarce resources. Thus, the constraints caused by scarcity are at the core of economic research. But there is a second set of constraints, which deserves attention: these are norms of all kinds, which govern human behavior in society. Such norms can take the form of laws, but – as has already be stated – they also comprise informal rules, customs, and traditions. They can be the result of explicit collective decision making, but they may also emerge tacitly. They are subject to change or they may be violated. The by now well established New Institutional Economics concentrates on the analysis of the emergence and change of such norms, their effect on human conduct as well as conditions for and consequences of violation. The work on both RIA and EAL may be comprised as subsets of that broader approach, which serves as the "meta-theory" here for reasoning about the emergence of norms in general.

Outlook

At first sight RIA has a strong flavor of pragmatism, much stronger than the more academically prone Economic Analysis of Law: the image of EAL meanwhile might be to be primarily an academic approach, a playground for quibblers, whereas RIA, despite the efforts to broaden its scope and to deepen the theoretical underpinnings, has conquered the marketplace for ideas as a tool designed to be applied for the practitioner. But EAL has not been developed just as a toy for contemplation of theoretical curiosity. The contrary is true: In the USA at least, it grew out of a down-to-earth request for reform (compulsory accident insurance for car-owners). And its advocates in Europe and other parts of the world always had the aspiration of reforming or at least complementing the orthodox approach to the law by a strictly analytical approach. In some sense, RIA does much the same as EAL does in some distinct areas of application. But the approach of RIA is pushed by the EU, OECD, and various member-states and has been strongly advocated and applied earlier in the USA, whereas EAL does not enjoy such almost continuous promotion; rather it is there to be discovered.

In this contribution the commonalities and differences in the two approaches have been investigated and the conclusion is that RIA and EAL not only do meet, meaning that they have much in common. Definitely they cannot merge. Rather they can be grasped as parts of a broader approach: that of new institutional economics. There they should meet, for the benefit of our society.

Cross-References

▶ Cost–Benefit Analysis
▶ Institutional Economics
▶ Transaction Costs

References

Adams M (2002) Normen, Standards, Rechte (Norms, standards, rights). In: Adams (ed) Ökonomische Theorie des Rechts (Economic theory of the law). Lang publishers, Frankfurt am Main, pp 25–60

Camerer CF, Loewenstein G, Rabin M (2011) Advances in behavioral economics. Princeton University Press, Princeton

Coase RH (1960) The problem of social cost. J Law Econ 3:1–44

Cooter R, Ulen T (1988) Law and economics. Harper Collins, Boston, Mass

Furubotn EG, Pejovich S (1974) Introduction. In: The economics of property rights. Cambridge University Press, Cambridge, MA, pp 1–10

Furubotn E, Richter R (1997) Institutions and economic theory: an introduction to and an assessment of the new institutional economics. University of Michigan Press, Ann Arbor

Gersen JE, Posner EA (2008) Soft law. Stanford Law Rev. University of Chicago, public law and legal theory working paper no. 213. Available at SSRN https://ssrn.com/abstract=1113537

Hopkins TD (1996) Regulatory costs in profile. Policy study no 132. Center for the Study of American Business, St. Louis

Kaplow L, Shavell S (2002) Economic analysis of law. In: Auerbach A, Feldstein M (eds) Handbook of public economics, vol 3. Elsevier, North Holland, pp 1661–1784

Morrall J (1994) Assessing costs and economic effects. In: Improving the quality of laws and regulations: economic, legal and managerial techniques. OECD, Paris, pp 39–43

OECD (1995) Budgeting for results, perspectives on public expenditure management. OECD, Paris

OECD (1997a) Assessing the impacts of proposed laws and regulations. SIGMA paper no. 13. OECD, Paris

OECD (1997b) Law drafting and regulatory management in Central and Eastern Europe. SIGMA paper no. 18. OECD, Paris

Ogus A (2004) Regulation, legal form and economic theory. Oxford, Hart

Renda A (2010) The development of RIA in the European Union: an overview. 20 Sept 2010. Available at SSRN https://ssrn.com/abstract=1679764 or https://doi.org/10.2139/ssrn.1679764

Schäffer H (ed) (2007) Evaluierung der Gesetze/Gesetzesfolgenabschätzung II (Evaluation of law/impact assessment). Manz, Vienna

Schotter A (1981) The economic theory of social institutions. Cambridge University Press, Cambridge, MA

Morgenstern RD (ed) (1997) Economic analyses at EPA. Ressources for the Future Inc, Washington, DC

Nijsen A et al (2009) Business regulation and public policy. Springer, New York

Weigel W (2008) Economics of the law. Routhledge, London/New York

Websites

http://ec.europa.eu/smart-regulation/impact/key_docs/key_docs_en.htm. 17 Aug 2017

http://ria-studies.net/en. 17 Aug 2017

http://www.oecd.org/regreform/. 17 Aug 2017

https://ec.europa.eu/info/law/law-making-process/better-regulation-why-and-how_en. 17 Aug 2017

Recommended Reading

Kirkpatrick C, Parker D (eds) (2007), Regulatory impact assessment – towards better regulation? Edward Elgar, Cheltenham

Regulatory Impact Assessment

Régis Lanneau
Law School, CRDP, Université de Paris Nanterre, Nanterre, France

Abstract

If regulation is often perceived as a tool to increase welfare, it is not infrequent that it leads to unintended consequences; examples are numerous. The purpose of regulatory impact assessment is precisely to help political decision-makers to identify whether and how to regulate while also defining a conception of the public interest that could then be debated. This entry will explain the logic and the development of RIA.

Introduction

If regulation is often perceived as a tool to increase welfare, it is not infrequent that it leads to unintended consequences; examples are numerous. After all, regulating in an evolving world of inherent complexity (and interdependence between economies) and uncertainty is not an easy task; it is the reason why it is bound to be a never-ending process. Nevertheless, it is not because perfect regulations are not from this world that it is not possible to develop tools to reduce the amount of inefficient regulations, especially when these regulations could be expected to impact many domains of a national or a regional economy. Regulatory impact assessments (RIA) are precisely trying to contribute to this aim by requiring regulators to assess the probable consequences of their regulation for the economy using models,

data, and evidence. These RIA are also supposed to help political decision-makers to identify whether and how to regulate while also defining a conception of the public interest that could then be debated. It is not then surprising that the practice of RIA is highly recommended by the OECD (1997) and part of its indicators to measure regulatory performance (see Radaelli 2004, for an explanation of the diffusion of RIA).

From the point of view of law and economics, RIA is both the recognition of its practical relevance and its inherent limitation for regulators and policy makers. Moreover, it helps to understand the real value of law and economics.

The Economic Logic Behind Regulatory Impact Assessment

In traditional law and economics, regulations are required in two situations: when the regulation can reduce transaction costs (defining the basic entitlements and the way to exchange them) or when it is supposed to reduce market failures (externalities, asymmetrical information or market power) (see Baldwin et al. (2010)). Nevertheless, as public choice emphasized, unproductive profit seeking by special interest groups to secure favorable regulation is definitional of the regulatory process (Tullock 1967), so there are no reasons why rational policy makers should implement only public interest regulation (Stigler 1971; Posner 1974; Peltzman 1976) without external constraints (public opinion's pressure or procedural requirement). Hence, regulations could merely be designed to redistribute wealth, and, when it does, these regulations should be considered as highly suspicious. This does not mean that, from an economic point of view, it is not possible to engage in policy choices but that these choices should be made sufficiently clear in their consequences to avoid the lurk of blindfold populism and moralism, an unavoidable risk in any democracy.

The mere need of RIA for enacting "better and smarter" regulations cannot be explained if it is possible to consider that regulations are only driven by the public interest and efficiency requirement. RIA is thus a tool to overcome some regulatory failures. It is not a tool to make sure that regulations are efficient but a tool to ensure that they are not blatantly inefficient because it is forcing policy makers and regulators to justify their policy not only through a political rhetoric but through an explanation of the trade-offs they are engaging in and the requirement to quantify and identify the public interest based on the best data available (of course the quality of the data will be crucial, Torriti 2011).

Of course, since RIA are costly (administrative cost and delay are necessarily creating such costs), their necessity and precision are dependent on the regulation at stake (Rose-Ackerman 2016). It is only because RIA are supposed to lead to some social benefits (avoidance of bad measures, welfare gain from enacting what appeared to be efficient) that its costs could be justified. It is then to be anticipated that RIA requirement should be higher when the regulation at stake, either by its breadth or magnitude, is significantly impacting the economy. The fact that this requirement appeared in the field of environment and health should not then be a surprise (see also Arrow et al. 1996; Livermore and Revesz 2013).

Regulatory Impact Assessment as a Process

A. Three stages of RIA could be distinguished: description, identification, and quantification (see also European Commission 2009; for an overview of the methods and domains, see Dunlop and Radaelli 2016).

At first a RIA should explain what is the problem (identification and definition) the regulation is supposed to curb and why an action is required. At this stage, this is the need for an intervention that should be assessed. Using economic theory, this need should be either a market failure or a means to reduce transaction costs.

The second stage is inquiring into the regulatory options. Indeed, a same problem could be addressed using a variety of regulatory tools

from command and control to economic incentives to mandatory disclosure or nudges. It is not only the "specie" of regulatory option that should be considered but also the variety within the "specie."

The third stage is dedicated to the quantification of the direct and indirect benefits and costs of each option (including the administrative and information regulatory burden; see also, more generally, Marneffe and Vereeck 2011; Hahn and Tetlock 2007). Of course, the benefits and costs can only be assessed through a set of hypotheses or choices regarding, more especially, the valuation methodology and baseline scenario. These hypotheses are crucial to assess the subjective value of the RIA for policy making (see, e.g., Ogus 1998; Rose-Ackerman 2011a; Hahn and Litan 2005). It will then be possible to compare options and eliminate obviously relatively inefficient options.

Being transparent about all these stages could contribute to a better accountability of regulators (since trade-offs are made clear) and to an increased consistency in regulations (since the need of a new regulation is explained). Moreover, with experience in RIA, better data and analytical methods should be expected to emerge. RIA is, from this point of view, a learning by doing a process.

B. RIA is not only a document (or a set of documents) providing information regarding the expected consequences of a regulation (an end result); it should be conceptualized much more as a process (Adler and Posner 2006). Indeed, as an "end result," it could be considered as a mere new rhetoric to justify regulatory choices; the hypotheses would then be chosen ex post to justify the desired regulation which will then be submitted to some formal or informal political debate – it is quite often this instrumental use of RIA that is criticized (Renda 2006). Conceptualized as a process, RIA exhibits two interesting features. First, it makes clear that RIA is a way to inquire into a regulatory problem: neither the problem nor its options are facts; they are identified and assessed differently depending on the state of knowledge. RIA, once made, is then not an end result but a "first draft" that will evolve with the comments and criticism of stakeholders. Second, RIA is not a stage after drafting a regulation; it should be developed in parallel of it to reduce the likelihood of an instrumental use. This also requires a complete transparency of the process.

The Rise of Regulatory Impact Assessment

The rise of RIA began in 1974, in the USA. President Ford's executive order 11821 established procedures for preparing inflation impact statements that were designed to illuminate the economic impact of regulatory proposals, specifically their effects on productivity and competition. Nevertheless, it is at the beginning of the 1980s that it became the mainstream in the USA. Indeed, President Reagan's executive order 12291 of 1981 states that "Regulatory action shall not be undertaken unless the potential benefits to society from the regulation outweigh the potential costs to society." Another 20 years was required for RIA to spread among OECD countries. During the 1990s and before 1997 (year of the first OECD publication on the subject even if RIA were recommended by the council of OECD in 1995), less than 10 OECD countries had comprehensive RIA program, by the end of 2000, 14, and since 2008, more than 30. Nowadays, almost all OECD countries have such programs despite differences (among which the definition of the type of regulation and intervention submitted to RIA). For example, in France, only primary legislation prepared by the government is subjected to RIA to the exclusion of all secondary legislation.

There are very few studies analyzing the potential of RIA for developing countries (Kirkpatrick and Parker 2003); Korea and Mexico are often mentioned as good examples of RIA design. However, in most developing countries, when RIA are present, they are not systematically used, and the methodology developed remains largely incomplete (Kirkpatrick et al. 2003). Rodrigo (2005) highlights the political requirements allowing RIA to prosper.

Conclusion

Even if RIA are often targeted as promoting "conservative" regulations and "deregulation," it is hard to deny the necessity of assessing the consequences of regulations. Once again, the purpose is not to make sure that only good regulations will be enacted or to avoid all negative unexpected consequences but to reduce the likelihood of bad regulations by clarifying available regulatory options. RIA should remain a tool to inform policy makers and regulators (see also Jasanoff 1990; Rose-Ackerman 2011b); it can be used adequately if and only if its limits are well identified (regarding model hypotheses and data quality and aggregation).

Cross-References

▶ Conflict of Interest
▶ Cost–Benefit Analysis
▶ Efficiency
▶ Government
▶ Rent Seeking

References

Adler M, Posner E (2006) New foundations of cost-benefit analysis. Harvard University Press, Cambridge, MA

Arrow KJ et al (1996) Benefit-cost analysis in environmental, health and safety regulation. AEI Press, Washington, DC

Baldwin R, Cave M, Lodge M (2010) The Oxford handbook of regulation. Oxford University Press, Oxford

Dunlop C, Radaelli C (Hrsg) (2016) Handbook of regulatory impact assessment. Edward Elgar Publishing, Cheltenham

European Commission (2009) Impact assessment guidelines, 15 Jan 2009, SEC(2009) 92

Hahn R, Litan R (2005) Counting regulatory benefits and costs: lessons for the US and Europe. J Int Econ Law 8:473–508

Hahn R, Tetlock PC (2007) The evolving role of economic analysis in regulatory decision making. AEI Brookings, November

Jasanoff S (1990) The fifth branch: science advisers as policymakers. Harvard University Press, Cambridge, MA

Kirkpatrick C, Parker D (2003) Regulatory impact assessment: developing its potential for use in developing countries, working paper series, no. 56, Centre on Regulation and Competition, Manchester

Kirkpatrick C, Parker D, Zhang Y (2003) Regulatory impact assessment in developing and transition economies: a survey of current practice and recommendations for further development. Centre on regulation and competition, Institute for Development Policy and Management, University of Manchester

Livermore M, Revesz R (Hrsg) (2013) The globalization of cost-benefit analysis in environmental policy. Oxford University Press, Oxford

Marneffe W, Vereeck L (2011) The meaning of regulatory costs. Eur J Law Econ 32(3):341–356

OECD (1997) Regulatory impact analysis, best practices in OECD countries. OECD Publishing, Paris. Available online: http://www.oecd.org/gov/regulatory-policy/35258828.pdf

Ogus A (1998) Regulatory appraisal: a neglected opportunity for law and economics. Eur J Law Econ 6(1):53–68

Peltzman S (1976) Toward a more general theory of regulation. J Law Econ 19(2):109–148

Posner R (1974) The social costs of monopoly and regulation. J Polit Econ 83(4):807–828

Radaelli C (2004) The diffusion of regulatory impact analysis in OECD countries: best practices or lesson-drawing? Eur J Polit Res 43:723–747

Renda A (2006) Impact assessment in the EU: the state of the art and the art of the state. CEPS Paperbacks, Brussels

Rodrigo D (2005) Regulatory impact analysis in OECD countries, challenges for developing countries. OECD working paper. Available online: https://www.oecd.org/gov/regulatory-policy/35258511.pdf

Rose-Ackerman S (2011a) Putting cost-benefit analysis in its place: rethinking regulatory review. Univ Miami Law Rev 65(2):335–356

Rose-Ackerman S (2011b) Étude d'impact et analyse coûts-avantages : qu'impliquent-elles pour l'élaboration des politiques publiques et les réformes législatives? [Impact assessment and cost-benefit analysis: what do they imply for policymaking and law reforms?]. Rev Fr Adm Publique 2011(4):787–806

Rose-Ackerman S (2016) The limits of cost/benefit analysis when disasters loom. Global Pol 7(S1):56–66

Stigler G (1971) The theory of economic regulation. Bell J Econ Manag Sci 2(1):3–21

Torriti J (2011) The unsustainable rationality of impact assessment. Eur J Law Econ 31(3):307–320

Tullock G (1967) The welfare cost of tariffs, monopoly and theft. West Econ J 5(3):224–232

Related Issues Are Business Ethics

▶ Codes of Conduct

Rent Seeking

Christopher J. Coyne and Garrett Wood
Department of Economics, George Mason
University, Fairfax, VA, USA

Definition

This chapter explores the concept of rent seeking. When resources earn returns in excess of those they could earn in their next best opportunity, economists call those returns "rents." In the market, the seeking of rents is known as profit seeking; in politics it is known as "rent seeking." Profit seeking generates social value through the competitive market process. Rent seeking results in social losses as finite resources are used to pursue transfers of wealth rather than in the production of new wealth. This entry explores the distinction between rent seeking and profit seeking and discusses the implications.

Introduction

Economic rent accrues to owners when their resources earn returns over and above those resources' opportunity cost. Rents can exist in private markets or in political settings. In private markets, rent seeking is referred to as "profit seeking" to denote that it generates a social surplus that is beneficial to society. In contrast, in political settings rent seeking generates social costs that are harmful to society. The next section explores the distinction between profit seeking and rent seeking in greater detail. We then discuss the problems with rent seeking for social welfare. The conclusion discusses the implications.

Profit Seeking Versus Rent Seeking

Since rents are nothing more than resources earning returns above their opportunity cost, it is important to make the distinction between circumstances in which pursuing rents is productive versus circumstances in which it is unproductive. Let us begin with rent seeking in the context of competitive markets.

In markets, entrepreneurs seek new opportunities to earn profits by reallocating scarce resources to new and better uses. This process is guided by market prices and subjected to the profit and loss test, which provides feedback as to whether the entrepreneur has been successful in increasing social value (Kirzner 1973, 1992, 1997; Thomsen 1992). A first-moving innovator, for example, who brings a profitable product to market, will earn a rent. However, these are "quasi-rents," a term intended to indicate that, in competitive markets, profits are temporary. The reason they are temporary is that in competitive markets, these quasi-rents will attract other entrepreneurs who will enter the market and erode the profit earned by the first mover. This process is socially beneficial because it leads to the efficient allocation of scarce resources. For this reason, rent seeking in the context of the competitive market is referred to as "profit seeking."

In political settings, rent seeking has dramatically different welfare implications. The political production of rents is artificial in nature and depends on practices, such as the granting of monopoly rights which raise barriers to entry, which destroy social wealth. Government-granted monopoly rights transfer a portion of consumer surplus to the monopoly producer. Part of the cost are foregone trades which otherwise would have taken place, resulting in a deadweight loss. The transfer itself, however, creates a pool of resources to be won and attracts fierce competition to secure the right to earn those profits (Tullock 1967). The difference in this scenario from that of the market situation, however, is that the competition in politics is over securing permanent privileges that prevent the erosion of rents (Buchanan 1980). While profits in markets represent quasi-rents, the rents earned through political competition endure precisely because the competition is over government-created protections from market forces.

Posner (1975) posits a rent-seeking game where a monopoly right worth $100,000 is bid for by ten risk-neutral rent seekers who cannot

recover their bids should they lose the game. Each bidder offers $10,000 resulting in the complete dissipation of rents. The $100,000 in bids spent in pursuit of the $100,000 in rents constitutes a social loss to the extent that the lobbying process is spent on activities that do not increase total social wealth by creating new value. Instead, these expenditures are made to secure the transfer of existing wealth.

Tullock (1967) compared the losses from rent seeking to the losses from counterbalancing investments in tools for thievery and safeguards against theft. Resources spent on the tools of thievery and preventative measures against thieves do not increase the size of the prize being sought or protected. Neither do resources spent by competing lobbyists to secure a government privilege, resulting in social waste.

Further exacerbating these social losses is that investments in rent seeking are specific. Resources spent by one individual developing influence over the politicians creating rents are mostly lost because that influence is difficult or impossible to transfer to another individual if the bid for rents fails. The social cost of rent-seeking activities is measured by the opportunity cost of the resources used. Entrepreneurs who direct their efforts to curry favor with politicians for narrow privileges cannot simultaneously exert that effort to provide a superior good or service for private consumers.

Certain scenarios can reduce the amount of rent seeking below the level of complete dissipation modeled by Posner. Baysinger and Tollison (1980) introduce consumers and consumer groups as interest groups capable of organizing to resist the creation of rents. The efforts of these groups reduce the expected payout of rent-seeking activities and thus results in lower bids and fewer resources wasted. In their model, consumers will tend to organize where the expected success of their counter-lobbying efforts is higher than the combined expected costs of organization and rent creation. Tullock (2001) models a rent-seeking game in which players are in marginal balance, each bidding $25 for a prize of artificial rents worth $100. The result is inframarginal gains from winning the game. This result depends on

players knowing how to find the optimal bidding strategy and knowing that the other player will also find it, an assumption that becomes more reasonable in instances of repeated play between professional lobbyists.

The incentives of the political agent creating rents must also be taken into account. Peltzman (1976) introduces political actors who face a trade-off between the rents they create for interest groups and the votes of their constituent consumers. The politician attempts to weigh the benefits gained from lobbying by rent seekers against lost votes from those constituents who incur a sufficient cost and alter their vote accordingly. Politicians are therefore incentivized, though perhaps weakly depending on the specific context, to limit the amount of rents they create in order to preserve enough votes to get reelected.

The Problem of Rent Seeking

Rent seeking encourages the use of scarce resources in competition over pools of wealth transferred from one party to another instead of in a competitive process that produces new wealth. This is harmful to the well-being of the members of a society because scarce resources are used to secure existing wealth as compared to creating new value. While beneficial to the individuals who win the rent-seeking competition, the cumulative effect of rent seeking is the "decline of nations" as members of society become increasingly focused on securing transfers of existing wealth (Olson 1982).

The extent of the problem posed by the creation of rents was underestimated for many years (Tollison 1982). Harberger (1954) demonstrated empirically that the deadweight loss to society from monopolization in US manufacturing around 1929 was low compared to GNP, less than 1% in fact. Harberger's calculations, however, did not account for the costs of rent seeking. Krueger (1974) found that rent-seeking activity in the Indian public sector accounted for 7.3% of GNP in 1964, while rent-seeking activity in Turkish import licensing accounted for 15% of GNP in 1968. Rama (1993) found that

R

rent-seeking activities in Uruguay led to temporary sectoral growth, but an overall decline in economic growth. Del Rosal (2011) offers a survey of empirical estimates of rent-seeking costs as a percentage of GNP and GDP, the amount of resources misallocated to unproductive professions, and other indicators. These estimates of the costs of rent seeking have to be added to the costs captured in the Harberger triangle to form more accurate estimates of the overall costs of monopoly.

Given that costs to society of rent seeking are often significant, it remains to be explained why the legislation that creates rents is so rarely repealed. Tollison (1982) highlights key features of the rent-seeking game to explain this phenomenon. In a world of zero transaction and information costs, no rent seeking would occur because the groups who incurred the dispersed costs of rent seeking would easily organize to protect themselves. In a world with positive transaction and information costs, however, some groups will find it easier to organize for lobbying activity. The groups that find it feasible to organize will seek transfers of wealth at the expense of groups who cannot easily organize to resist their efforts. Groups organized for lobbying often involve members of industry or labor, but rarely do they form around consumers in general due to the costs of organization. The concentrated transfers to be won from successful lobbying efforts, combined with the high cost of organizing the numerous, dispersed consumers who shoulder the burden of rent seeking, prevent society from realizing the potential gains of repealing rent-creating legislation.

Conclusion

Baumol (1990) argued that while policy decisions are limited in altering society's overall supply of entrepreneurs, they can heavily influence the allocation of entrepreneurial efforts across different types of activities. In societies where large profits can be made through competitive markets, entrepreneurs will allocate their resources to engaging in productive, value-added activities. In societies

where rents can be earned through political means, in contrast, entrepreneurs will invest in unproductive, rent-seeking activities. The overall balance between productive and unproductive entrepreneurial activities is a function of the rules of the game which influence the payoffs associated with each type of activity. This logic offers crucial insight into the process underlying the economic rise and decline of societies throughout time and across geographic space.

Cross-References

▶ Coase, Ronald
▶ Economic Analysis of Law
▶ Economic Performance
▶ Entrepreneurship
▶ Externalities
▶ Gordon Tullock: A Maverick Scholar of Law and Economics
▶ Government
▶ Government Quality
▶ Law and Economics
▶ Market Definition
▶ Political Competition
▶ Political Corruption
▶ Political Economy
▶ Politicians
▶ Protective Factors
▶ Public Interest
▶ State Aids and Subsidies
▶ Transaction Costs

References

Baumol W (1990) Entrepreneurship: productive, unproductive, and destructive. J Polit Econ 98(5): 893–921
Baysinger B, Tollison R (1980) Evaluating the social costs of monopoly and regulation. Atl Econ J 8(4):22–26
Buchanan JM (1980) Rent seeking and profit seeking. In: Buchanan J, Tollison R, Tullock G (eds) Toward a theory of the rent-seeking society. Texas A&M University Press, College Park, pp 3–15
Del Rosal I (2011) The empirical measurement of rent-seeking costs. J Econ Surv 25(2):298–325
Harberger A (1954) Monopoly and resource allocation. Am Econ Rev 44(2):77–87

Kirzner I (1973) Competition and entrepreneurship. University of Chicago Press, Chicago

Kirzner I (1992) The meaning of the market process: essays in the development of modern Austrian economics. Routledge, New York

Kirzner I (1997) Entrepreneurial discovery and the competitive market process: an Austrian approach. J Econ Lit 35(1):60–85

Krueger A (1974) The political economy of the rent-seeking society. Am Econ Rev 64(3):291–303

Olson M (1982) The rise and decline of nations: economic growth, stagflation, and social rigidities. Yale University Press, New Haven

Peltzman S (1976) Toward a more general theory of regulation. J Law Econ 19(2):211–240

Posner R (1975) The social costs of monopoly and regulation. J Polit Econ 83(4):807–827

Rama M (1993) Rent seeking and economic growth: a theoretical model and some empirical evidence. J Dev Econ 42(1):35–50

Tollison R (1982) Rent seeking: a survey. Kyklos 35(4):575–602

Thomsen EF (1992) Price and knowledge: a market-process perspective. Routledge, New York

Tullock G (1967) The welfare costs of tariffs, monopolies, and theft. West Econ J 5(3):224–232

Tullock G (2001) Efficient rent seeking. In: Lockhard A, Tullock G (eds) Efficient rent-seeking: chronicle of an intellectual quagmire. Kluwer Academic Publishers, Norwell, pp 3–16

Resale Right

▶ Droit de Suite

Retributivism

Mark D. White
Department of Philosophy, College of Staten Island/CUNY, Staten Island, NY, USA

Definition

A theory of punishment that maintains that wrongdoers deserve to be punished, in proportion to their crimes, as a matter of justice or right.

Retributivism is a theory or philosophy of criminal punishment that maintains that wrongdoers deserve punishment as a matter of justice or right. It is often contrasted with deterrence, which justifies punishment on the basis on the future harms it prevents. (On theories of punishment, see the papers in Acton (1969), Duff and Garland (1994), and Simmons et al. (1995); for concise syntheses, see Tunick (1992) and Brooks (2012).)

Drawing on the terminology of moral philosophy, retributivism is often characterized as *deontological* in nature, being based on qualitative concepts of justice and the right, while deterrence is *consequentialist*, focused on minimizing the negative outcomes from crime. This is, admittedly, an overgeneralization: for instance, Moore (1993), Cahill (2011), and Berman (2013) have suggested that retributivism can be regarded as a consequentialist or instrumentalist theory in which punishment or justice are goods to be maximized (see Dolinko (1997) for a counterargument). Nonetheless, it remains that retributivism is linked to justice rather than welfare or utility, and this leads to more specific and useful ways to distinguish it from alternative theories of punishment.

Before we can fully appreciate retributivism, we must briefly discuss deterrence. The formal basis for deterrence can be traced to classical utilitarianism, particularly the policy recommendations of Jeremy Bentham (1781) and the criminology of Cesare Beccaria (1764). As punishment by its nature is harmful, it is justified only insofar as it prevents greater harm: "All punishment in itself is evil. Upon the principle of utility, if it ought at all to be admitted, it ought only to be admitted in as far as it promises to exclude some greater evil" (Bentham 1781, p. 170). One way punishment "excludes some greater evil" is through deterring future crime by incapacitating the guilty and creating an incentive for others to abstain from criminal activity, both of which lessen the incidence of crime going forward.

Deterrence is not focused on lessening crime itself but rather on minimizing the overall costs of crime, including not only the harms done by criminals but also the costs of punishment, prosecution, and apprehension. This inclusive definition of the costs of crime implies that some crimes will be unworthy of punishment because it is "*groundless*: where there is no mischief for it to prevent…

inefficacious: where it cannot act so as to prevent the mischief... *unprofitable*, or too *expensive*: where the mischief it would produce would be greater than what it prevented...[or] *needless*: where the mischief may be prevented, or cease of itself, without it: that is, at a cheaper rate" (Bentham 1781, p. 171). It is no surprise that this general framework of deterrence was adopted by Becker (1968) and other economists as they began to study crime and developed theories of efficient punishment that refined and expanded on the early insights of Bentham and Beccaria.

Retributivism is not concerned with the effects of punishment on future behavior or costs but instead solely addresses the crime for which the perpetrator is to be punished. For this reason, retributivism is often referred to as "backward-looking," focusing on the crime which was committed in the past, while deterrence is characterized as "forward-looking," taking the past crime as given and exacting a punishment designed to minimize the future costs of crime. While deterrence sees no inherent value in punishment itself, but instead sees it as a tool to maximize utility or minimize harm, retributivism maintains that the state has a moral, political, or legal duty to punish wrongdoers.

While embedded in discussions of justice going back to Plato and Aristotle, the modern roots of retributivism are usually traced back to Immanuel Kant, for whom retributivism stemmed from his belief in the respect owed to persons due to their inherent dignity as autonomous beings. While his position on punishment is more complex then often acknowledged (as pointed out by Murphy 1987), several statements he made exemplify the basic tenets of retributivism. For instance, Kant held that punishment must be imposed only in response to the crime committed and "can never be inflicted merely as means to promote some other good for the criminal himself or for civil society. It must always be inflicted upon him only because he has committed a crime. For a human being can never be treated merely as a means to the purposes of another" (1797, p. 331). Kant addressed the danger of punishing the innocent and the other goals of punishment when he wrote a person "must previously have been found *punishable* before any thought can be given to drawing from his punishment something of use for himself or his fellow citizens" (1797, p. 331). Along with Hegel (1821), Morris (1968), and Murphy (1973), Kant emphasized that retributivism is grounded in respect for the individual, giving the guilty what they are owed by virtue of what they did, as a matter of impersonal justice rather than the base emotions of revenge or vengeance (a distinction explored by Nozick (1981, pp. 366–368)).

Retributivism can be classified as either negative or positive. *Negative retributivism* places limits on the subject and severity of punishment: the innocent should never be punished, and the guilty should not be punished more than is proportionate to their crimes. *Positive retributivism* goes further, endorsing the upper limits on punishment imposed by negative retribution while also maintaining that the guilty must be punished and not less than is proportionate to their crimes (thereby imposing a duty of overall proportionality). (This distinction is usually attributed to Mackie (1985) and has since become standard in the literature on punishment.)

Negative retributivism is often seen as a side constraint on the pursuit of deterrence that prevents it from considering the punishment of innocents or imposing disproportionately severe punishments on the guilty. Deterrence constrained by negative retributivism is a common *hybrid theory* of punishment as suggested most famously by Hart (1968); some, such as Byrd (1989), argue that this was Kant's complete view as well. While the intentional punishment of the innocent may be more of a theoretical possibility than a practical threat in most modern democracies, the practice of disproportionately severe punishments is a logical implication of efficient deterrence. For instance, Becker (1968) showed that, in many cases, enforcement costs can be lowered while achieving the same level of deterrence if the probability of punishment is lowered – reducing enforcement costs – while the severity of punishment is raised, most likely above a level proportionate to the crime. (One example is littering, which in the

United States carries an extremely low chance of apprehension and posted fines much higher than any measure of the resulting harm.) While this may be efficient from a cost-minimization point of view, the negative retributivist would object that it subjects the guilty person to a greater punishment than he or she deserves in light of the crime committed.

Positive retributivism adds the imperative of punishing the guilty and ensuring that the punishment not be disproportionately mild; as Kant wrote, "woe to him who crawls through the windings of eudaemonism in order to discover something that releases the criminal from punishment or even reduces its amount by the advantage it promises" (1797, p. 331). Since negative retributivism does not mandate punishment at all, some doubt whether it counts as retributivism (Cottingham 1979). But positive retributivism is "complete," mandating that all wrongdoers be punished and in proportion to their crimes, with the punishment neither too harsh or too light in comparison to the crime.

However, the stricter nature of positive retributivism presents a number of problems both theoretical and practical. For one, while it is easy to argue that the innocent must not be punished, it is more difficult to argue why the guilty *must* be punished (without recourse to preventing future harm). Perhaps the simplest justification – if we can even call it that – is to invoke the ancient code of the *lex talionis*, "an eye for an eye and a tooth for a tooth." Kant cites this approvingly when he asks "what kind and what amount of punishment is it that public justice makes its principle and measure? None other than the principle of equality... Accordingly, whatever undeserved evil you inflict upon another within the people, that you inflict upon yourself.... But only the *law of retribution* (*ius talionis*)... can specify definitely the quality and the quantity of punishment" (1797, p. 332). The *lex talionis* certainly prescribes a strict proportionality which would be impossible in most cases, and it is seen by most retributivists as simplistic, harsh, and inhumane; some doubt its relevance to retributivism at all (Davis 1986).

Most modern retributivists justify due punishment on other grounds. Intrinsic retributivists maintain that punishment of the guilty is an intrinsic good that does not derive its value from anymore basic precept. (See Davis (1972) for one example, arguing against Honderich (1984), who coined the term and criticized the concept.) But others find a justification for retributivist punishment in a broader political theory, often based on a version of reciprocity that maintains that the guilty "owe a debt" to society or their fellow citizens and punishment restores this balance (famous from Plato's *Crito* (360 BCE); for surveys of such theories, see Tunick (1992, ch. 3), and Duff (2001, ch. 1)). For example, many retributivists, such as Morris (1968), argue that while innocent citizens bear the costs of compliance with the law, the guilty "free ride" on these efforts, gaining unfair advantage that must be repaid to restore balance (Kant was sympathetic to this view as well, according to Murphy 1972). Similarly, some retributivists maintain that the purpose of punishment is, in the words of Hegel (1821, p. 69), "to annul the crime, which otherwise would have been held valid, and to restore the right."

Finally, there are justifications for positive retributivism that are not based on reciprocity, such as denunciation or expression of condemnation (Feinberg 1965; von Hirsch 1985; Markel 2011) and moral education and communication (Hampton 1984; Duff 2001). Note that these justifications are goal oriented in nature, focused on an end result of punishment, albeit one that is more specific than deterrence or harm reduction and also tied closely to the crime committed. Nozick (1981, p. 371) calls such theories of punishment *teleological retributivism* because they focus on an end other than the suffering of the guilty; Berman (2013) argues that most modern retributivist theories are teleological or instrumental in nature.

Another problem facing positive retributivism (and even negative retributivism to a degree) is how to determine a type and degree of punishment that is proportionate to – or "fits" – a given crime. The *lex talionis* demands literal proportionality, the spirit of which survives today in jurisdictions

R

which prescribe the death penalty for murderers despite questionable deterrent effect (Ehrlich and Liu 2006), but is impractical or unthinkable in cases like battery, rape, or attempted murder. Even Kant, who supported the *lex talionis*, appreciated its limitations, asking "but what is to be done in the case of crimes that cannot be punished by a return for them because this would be either impossible or itself a punishable crime against *humanity* as such?" and recommending that "what is done to [the wrongdoer] in accordance with penal law is what he has perpetrated on others, if not in terms of its letter at least in terms of its spirit" (1797, p. 363).

While equivalence is not possible, it is widely agreed that, at the very least, more serious crimes should be punished more severely. But even this determination is not as easy as it may seem: while various degrees of one crime, such as murder or theft, can be ranked and punished appropriately, determining proportionate punishment for two different crimes is more difficult. Card (1975), von Hirsch (1976), and Davis (1983) are seminal works in this area, but some (such as Wertheimer 1975) remain skeptical that a consistent, proportional system of punishment is possible at all. More fundamentally, retributivists disagree on what determines the severity of a crime: whether the harm done or intended, the degree of wrongdoing, or the culpability of the criminal. (See Davis (1986) on harm versus wrong and Alexander et al. (2009) on culpability.) Given the controversy over what determines the severity of crimes themselves, the difficulty of ranking them in order to assign proportionate penalties becomes even more difficult.

A final problem with retributivist punishment on which economics is particularly well suited to comment is its resource cost. Economists and economics-minded legal scholars have paid very little attention to retributivism; as Posner (1980, p. 92) wrote, it is "widely viewed as immoral and irrational, at least as primitive and non-rational." (For similar views, see also Kaplow and Shavell (2002) and Sunstein (2005); a notable exception to the antipathy among economists to retributivism is Wittman (1974)). At the same time, legal philosophers have not paid much attention to the economic ramifications of retributivism, although Avio (1990, 1993), Cahill (2007), and White (2009) have started to look at this issue. The problem with implementing a retributivist system of punishment in the real world is that its perfectionist nature ("the guilty *must* be punished in proportion to their crimes") does not easily allow for the compromises required in a world of scarcity. If governments tried to punish all wrongdoers according to their just deserts – including making every possible attempt to apprehend and prosecute them – the criminal justice would end up absorbing all of the society's resources (White 2009; see Braithwaite and Pettit (1990) on system-wide considerations of retributivism). For this reason, some recommend a hybrid theory of punishment with negative retributivism as a limited factor (Avio 1993), a consequentialist retributivism that seeks to maximize some measure of justice (Cahill 2007, 2011), or a "pro tanto retributivism" that considers necessary compromises to result from a balancing of competing principles (White 2011a).

Retributivism remains a vital area of interest and research, with contemporary scholars attempting to refine its principles in the context of a constantly evolving political world (White 2011b) and exploring the implications of new developments in neuroscience and psychology (Nadelhoffer 2013). Although it does not sit well with the utilitarian foundations of the economic approach to law, economists should take note of the extent to which retributivism lies at the root of much of criminal law doctrine and how it steers the criminal justice system away from textbook models of efficiency, affecting resource allocation throughout the criminal justice system and society as a whole. This knowledge is also integral to the way that legal scholars and philosophers understand how retributivism works in the real world.

Cross-References

▶ Crime and Punishment (Becker 1968)
▶ Criminal Sanctions and Deterrence
▶ Lex Talionis

References

Acton HB (ed) (1969) The philosophy of punishment: a collection of papers. St. Martin's Press, New York

Alexander L, Ferzan KK, Morse S (2009) Crime and culpability: a theory of criminal law. Cambridge University Press, Cambridge

Avio KL (1990) Retribution, wealth maximization, and capital punishment: a law and economics approach. Stetson Law Rev 19:373–409

Avio KL (1993) Economic, retributive and contractarian conceptions of punishment. Law Philos 12:249–286

Beccaria C (1764) on crimes and punishments (trans: Young D). Hackett Publishing, Indianapolis (1986 edn)

Becker GS (1968) Crime and punishment: an economic approach. J Polit Econ 76:169–217

Bentham J (1781) The principles of morals and legislation. Prometheus Books, Buffalo (1988 edn)

Berman MN (2013) Two kinds of retributivism. In: Duff RA, Green SP (eds) Philosophical foundation of criminal law. Oxford University Press, Oxford, pp 433–457

Braithwaite J, Pettit P (1990) Not just deserts: a republican theory of criminal justice. Clarendon, Oxford

Brooks T (2012) Punishment. Routledge, Abingdon

Byrd BS (1989) Kant's theory of punishment: deterrence in its threat, retribution in its execution. Law Philos 8:151–200

Cahill MT (2007) Real retributivism. Wash Univ Law Rev 85:815–870

Cahill MT (2011) Punishment pluralism. In: White MD (ed) Retributivism: essays on theory and policy. Oxford University Press, Oxford, pp 25–48

Card C (1975) Retributive penal liability. Am Philos Q Monogr 7:17–35

Cottingham J (1979) Varieties of retribution. Philosl Q 29:238–246

Davis LH (1972) They deserve to suffer. Analysis 32:136–140

Davis M (1983) How to make the punishment fit the crime. Ethics 93:726–752

Davis M (1986) Harm and retribution. Philos Public Aff 15:246–266

Dolinko D (1997) Retributivism, consequentialism, and the intrinsic goodness of punishment. Law Philos 16:507–528

Duff RA (2001) Punishment, communication, and community. Oxford University Press, Oxford

Duff RA, Garland D (eds) (1994) A reader on punishment. Oxford University Press, Oxford

Ehrlich I, Liu Z (eds) (2006) The economics of crime, vol III. Edward Elgar, Cheltenham

Feinberg J (1965) The expressive function of punishment. In: Doing and deserving. Princeton University Press, Princeton, pp 95–118

Hampton J (1984) The moral education theory of punishment. Philos Public Aff 13:208–238

Hart HLA (1968) Punishment and responsibility: essays in the philosophy of law. Oxford University Press, Oxford

Hegel GWF (1821) The philosophy of right (trans: Knox TM). Oxford University Press, Oxford (1952 edn)

Honderich T (1984) Punishment: the supposed justifications, rev edn. Penguin Books, Harmondsworth

Kant I (1797) The metaphysics of morals (trans: Gregor M). Cambridge University Press, Cambridge (1996 edn)

Kaplow L, Shavell S (2002) Fairness versus welfare. Harvard University Press, Cambridge, MA

Mackie JL (1985) Persons and values. Clarendon, Oxford

Markel D (2011) What might retributive justice be? The confrontational conception of retributivism. In: White MD (ed) Retributivism: essays on theory and policy. Oxford University Press, Oxford, pp 49–72

Moore M (1993) Justifying retributivism. Isr Law Rev 27:15–49

Morris H (1968) Persons and punishment. The Monist 52:475–501

Murphy JG (1972) Kant's theory of criminal punishment. In: Beck LW (ed) Proceedings of the third international kant congress. D. Reidel, Dordrecht, pp 434–441

Murphy JG (1973) Marxism and punishment. Philos Public Aff 2:217–243

Murphy JG (1987) Does Kant have a theory of punishment? Columbia Law Rev 87:509–532

Nadelhoffer TA (2013) The future of punishment. Oxford University Press, Oxford

Nozick R (1981) Philosophical explanations. Belknap, Cambridge, MA

Plato (360 BCE) Crito (trans: Jowett B). Available at http://classics.mit.edu/Plato/crito.html

Posner RA (1980) Retribution and related concepts of punishment. J Leg Stud 9:71–92

Simmons AJ, Cohen M, Cohen J, Beitz CR (eds) (1995) Punishment: a philosophy & public affairs reader. Princeton University Press, Princeton

Sunstein C (2005) On the psychology of punishment. In: Parisi F, Smith VL (eds) The law and economics of irrational behavior. Stanford University Press, Stanford, pp 339–357

Tunick M (1992) Punishment: theory and practice. University of California Press, Berkeley

Von Hirsch A (1976) Doing justice: the choice of punishments. Hill and Wang, New York

Von Hirsch A (1985) Past or future crimes: deservedness and dangerousness in the sentencing of criminals. Rutgers University Press, New Brunswick

Wertheimer A (1975) Should punishment fit the crime? Soc Theory Pract 3:403–423

White MD (2009) Retributivism in a world of scarcity. In: White MD (ed) Theoretical foundations of law and economics. Cambridge University Press, Cambridge, pp 253–271

White MD (2011a) *Pro Tanto* retributivism: judgment and the balance of principles in criminal justice. In: White MD (ed) Retributivism: essays on theory and policy. Oxford University Press, Oxford, pp 129–145

White MD (ed) (2011b) Retributivism: essays on theory and policy. Oxford University Press, Oxford

Wittman D (1974) Punishment as retribution. Theory Decis 4:209–237

R

Risk Management, Optimal

Andrew Torre
School of Accounting, Economics and Finance,
Deakin University, Melbourne, VIC, Australia

Abstract

Individuals continually confront a discrepancy between ever expanding and changing wants and the means that they have at their disposal, time, and income, to satisfy them. One of the consequences is the need to make constrained choices between alternatives that have uncertain outcomes. Risk is a different concept from uncertainty. Individual optimal risk management means reducing, eliminating, or fully bearing risk, after conducting a "cost-benefit" analysis. In practice, however, cognitive biases mean that many decisions are not economically rational, necessitating paternalistic government and judicial interventions. Systemic, or whole financial system collapse risk is, optimally managed using well-designed macroprudential regulatory tools. The source of this type of risk is the inherent dynamics of the financial system over the course of the business cycle, interacting with credit market negative externalities, often as in the case of the GFC, spawned by government regulatory failure.

Synonyms

Financial risk; Operational risk; Systemic risk

Definition

Individually, decision makers optimally or rationally manage operational and financial risk, when they reduce it, eliminate it completely, or fully bear it, after conducting a "cost-benefit" analysis. Systemic, or the risk of whole financial system collapse, which arises due to credit market externalities, is managed optimally by appropriate macroprudential regulation.

Introduction

Risk and uncertainty are distinct economic concepts in economic theory; however, most contemporary microeconomic texts tend to use these terms interchangeably. In a risky situation, a rational decision maker confronts well-defined probabilities, while in an uncertain one, these are not known, or poorly defined (Knight 1921). This entry is only concerned with the management of risky choices, interpreted in an economic framework. Individuals and businesses confront and have to manage operational and financial risks. Attempts are made to minimize the cost of risk using "tangible assets or actions" in the former, and "options on financial instruments or commodities" in the latter case, respectively (Viney 2011, p. 383). In addition, governments need to optimally manage systemic or the risk of total financial system collapse. "Whole system" risk management is particularly topical given the recent global financial crisis (GFC) and its aftermath, which is still very evident in parts of Europe and to a lesser extent in America.

At the outset it should be noted that there is a large "noneconomic" literature on risk management. An example is provided by Ritchie and Reid (2013) in the context of ecotourism businesses. They provide three different definitions gleaned from different sources: first, "The Australian and New Zealand Standard," which defines risk as "the effect of uncertainty on objectives" (p. 274); second, Glaesser who defines risk as "the product of magnitude of damage and the probability of occurrence" (ibid.); and third, Priest, who "differentiates between real and perceived risk, with perceived risk the best estimate of real risk" (ibid). The authors' definition of risk is "any threat that will negatively impact an organization's ability to achieve its objectives and execute its strategies successfully" (ibid.).

Rational Strategies to Deal with Risk

A simple example will enable the reader to see how rational optimizing decisions are made under risk and uncertainty. A risk-averse Amanda is

**Risk Management,
Optimal, Fig. 1** Simple
Decision Tree illustrating
Risk and Uncertainty
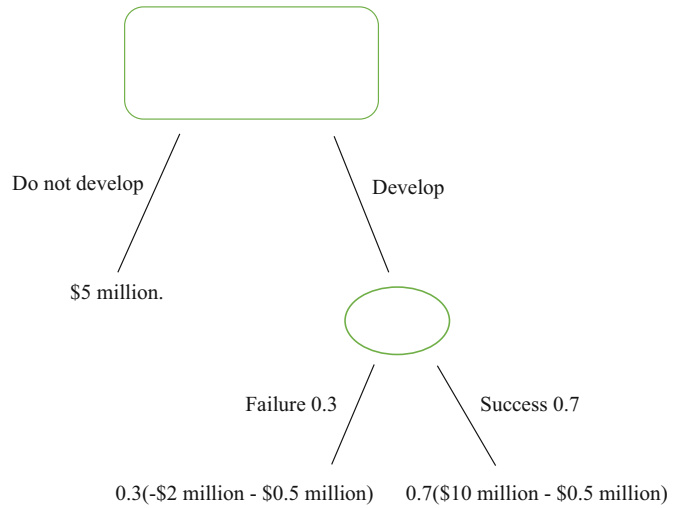
running a software development business and has
to decide whether to develop a piece of software
for a new overseas export market. If she succeeds
in the export market she gains $10 m, if not she
loses $2 m. The payoffs $10 m and $2 m are equal
to the profit from each alternative. If the software
is not developed, the business will continue to
earn $5 m a year. The estimated probabilities of
success and failure are 0.7 and 0.3 respectively,
and Amanda's risk premium is $0.5 million. It is
useful to set out this information in terms of a
decision tree that incorporates uncertainty and,
in this instance, operational risk as two distinct
concepts (Fig. 1).

Operational risk is incorporated into the anal-
ysis by adjusting the decision maker's payoffs,
while probabilities attached to each of the
branches of the lower portion of the decision tree
introduce uncertainty. When there is uncertainty,
the payoffs become expected values. Since risk is
a cost to a risk averter, the risk premium is sub-
tracted from expected profit in each of the payoffs.
Expected profit equals: 0.3 (-$2 m - $0.5 m) + 0.7
($10 m–$0.5 m) = $5.9 million. Since
$5.9 m > $5 m, the software should be developed
even though Amanda is risk averse. The decision
would be reversed if the cost of risk was high
enough to make the expected profit from
exporting < $5 m. If Amanda was a risk taker,
the $0.5 m, being a benefit, would be added to
each of the payoffs. The expected profit would be

$6.9 m, which would be > $5 m, and the software
would be exported. If she was risk neutral, it
would not be necessary to make any adjustment
to the payoffs, since risk is neither a cost nor a
benefit. The expected profit would be $6.4 m.
Again the optimal decision would be to export
the software. In Amanda's case, the operational
risk is rationally managed by using a decision tree
that factors in the probabilities of success (failure)
and the cost of risk. This is a form of "cost-
benefit" analysis. If the venture fails, she absorbs
the expected loss.

Legal Regulation of Operational and
Financial Risk Management

The above analysis is predicated on the assump-
tion that decision makers are economically ratio-
nal; however, human cognitive biases
considerably complicate risk management. Thaler
and Sunstein (2008) characterize the human brain
as having two separate cognitive systems, which
are in conflict with each other, resulting in a ten-
dency for irrational to dominate rational decision-
making. The first or automatic system is in the
words of the authors, "uncontrolled, effortless,
associative, fast, unconscious and skilled"
(p. 19), while they characterize the second or
reflective system as "controlled, effortful, deduc-
tive, slow, self-aware and rule following" (p. 20).

As a consequence of this brain anatomy, humans are prone to exhibit a number of cognitive biases in different contexts, which make risk management along the lines of the rational "cost-benefit" model difficult to achieve in practice. There are two responses to this dilemma: government paternalistic interventions and legal regulation. An example of the former would be making the wearing of protective clothing and a mask compulsory for asbestos removal, rather than optional, based on individuals' assessment of their own risk of subsequent harm.

In addition, judge-made or common law complements government paternalistic policies to assist individuals manage risk optimally. Both contract and torts laws are fundamentally concerned with the issue of whether an actual loss should be allowed to lie where it falls or shifted onto someone else. Torts law differs from contract law in that it regulates non-contractual interpersonal relationships. Specifically, the law pertaining to exemption clauses in standard form contracts and the tort of negligence both address risk management in settings of inequality of bargaining power and high bargaining costs, respectively.

Since the common law of contract is predicated on the principle of freedom of bargaining, there is both judicial and statutory reluctance to interfere with a voluntarily and honestly negotiated allocation of risks between the parties. An example is the specification of the contingencies that impact the promisor's obligation to perform the contract, such as physical destruction of goods before their delivery date falls due. At common law the general rule is that "prima facie a promisor takes the risk of an event happening, which prevents him from performing his promise" (Scanlan's New Neon Ltd v Tooheys Ltd (1943) 67 CLR 169 at 200 (Latham CJ), cited in Seddon and Ellinghaus (**1.107**, 2008). However in the case of a sale of goods, s. 12 of the 1958 Victorian Goods Act provides that "subject to contrary agreement a contract to sell specific goods is avoided if the goods perish without fault of either party" (Seddon and Ellinghaus **19.17**). As the parties are free to stipulate a different allocation of risk, the common law principle of freedom of contract is preserved.

Fairness in the negotiation process, as such, is not a guiding principle in allocating risks between the parties, rather "it is the essence of entrepreneurship that parties will sometimes act with selfishness" (Kirby P in Biotechnology Australia Pty Ltd v Pace, (1988) 15 NSWLR 130, 132–133, (cited in Paterson (2012), **1.40**). This also applies to consumer contracts, as explained by McHugh J in West v AGC (Advances) Ltd (1986) 5 NSWLR 610, 621. "I do not see how that contract can be considered unjust simply because it was not in the interest of the claimant to make the contract or because she had no independent advice" (Paterson, **1.40**). As long as consumers can choose between competing standard form contracts with different price and term combinations, then these contracts "represent the agreed allocation of risk by contracting parties, and interference in these agreements is likely only to produce inefficient outcomes" (Paterson, **1.60**). Rational bargaining implies that expected contingencies are allocated on the basis of the lower-cost bearer or avoider of the risk. In practice, however, higher-cost bearers may be observed subsuming risks due to relatively weak bargaining positions and/or cognitive biases, infecting the negotiating process. A very likely outcome of this incongruity is terms that are unfair and/or inefficient. This issue has been addressed by both the common law and more recently the Australian legislature.

(a) Exemption clauses in standard form contracts at common law

Exclusion or limitation clauses are a classic risk allocation and management device found in standard form contracts; examples of these purporting to shift risk include "sold with all faults," "no warranty given," "all implied terms excluded," and "at own risk" (Seddon and Ellinghaus 2008, **10.62**). These are efficient (inefficient) if they shift risk onto the party whose precaution plus risk costs are lower (higher). Adopting the Kahneman (2011) formulation, they are unfair if they can be construed as an "exploitation of market power by the promisor to impose a loss on the promisee" (p. 306). In considering exemption clauses in standard-form contracts, the courts have distinguished negotiations between businesses from those between a business and consumer, on the basis of differences

in equality of bargaining power. An example of this judicial dichotomy is found in Photo Production Ltd v Securicor Ltd [1980] AC 827, where Lord Diplock wrote at 851: "in commercial contracts negotiated between business-men capable of looking after their own interests, and of deciding how risks inherent in the performance of various kinds of contract can be most economically borne (generally by insurance), it is, in my view, wrong to place a strained construction upon words in an exclusion clause, which are clear and fairly susceptible of one meaning only, even after due allowance has been made for the presumption in favour of the implied primary and secondary obligations" (Clarke et al. 2008, p. 252).

In relation to consumers, while the High Court of Australia (HCA) in Sydney City Council v West (1965) 114 CLR 481 has rejected the doctrine that an exclusion clause cannot provide protection against liability for a "fundamental breach," regardless of how widely it is drafted, the courts have nevertheless "prevented exemption clauses from being used unconscionably against consumers by a rigorous application of the ordinary rules of construction" (Clarke et al., p. 251). Consequently, exemption clauses cannot be used to excuse a "radical breach of the promisor's obligations under the contract" (Windeyer J in TNT (Melbourne) Pty Ltd v May & Baker (Australia) Pty Ltd (1966), 115 CLR 353. HCA (Clarke et al., pp. 256–258). Generally, at common law, the party who wishes to shift risk using an exemption clause has to show that it has been incorporated into the contract and, when correctly construed, is applicable to the situation at hand (Seddon and Ellinghaus, **10.66**). An example of a rule of construction is the "four corners rule," which states that "an exclusion clause will confer protection only in respect of conduct that occurred in the performance of the contract" (Clarke et al., p. 256). Therefore, if a council inserts an exemption clause in a contract of bailment seeking to protect it from loss of, or damage to, parked vehicles, this term will be construed "contra proferentem" against the bailee. As such, "it will not protect the Bailee from 'storing the goods in a place or in a manner other than that authorised by the contract, or if the Bailee consumes or destroys them instead of storing them, or if he

sells them" (The Council of the City of Sydney v West (1965) 114 CLR 481, HCA, per Barwick CJ and Taylor J. (Clarke et al., p. 256).

The attack on unfair contract terms has been taken up by the Australian legislature, through its enactment of the Unfair Contract Terms Law ("UCTL"), contained in Pt 2-3 of the Australian Consumer Law ("ACL"), in Schedule 2 to the Australian Competition and Consumer Act 2010 ("CCA"), and Pt 2 Div 2 Subdiv. BA of the Australian Securities and Investments Commission Act 2001 (Cth) ("ASIC Act") (Paterson **1.10**.) Exclusion clauses are regulated under the consumer guarantees law (CGL) (Paterson **13.50**). Consumer guarantees, which apply to the supply of goods and services to a consumer, replace the implied terms regime under the now repealed Australian Trade Practices Act (1974), since it was thought that these were too complex and uncertain (Paterson **11.30**). The consumer guarantees are to be found in Chapter 3 Pt 3-2 Div. 1 Subdiv. A of the Australian Consumer Law (Paterson **11.80**). An example is that the goods will be of acceptable quality, i.e., inter alia, free from defects, safe, and durable (Paterson **11.80**, **11.90**). While the risk of unacceptable quality is prima facie borne by the seller, the legislation shifts it onto the buyer in the following circumstances, in which case the purchaser cannot rely on the acceptable quality guarantee. First, defects are specifically drawn to the consumer's attention; second, they are caused by abnormal use; or third, the consumer should reasonably have become aware of them since they were examined before being bought (Paterson **11.90**). Other than in these cases, an exclusion clause inserted into the contract, which purports to exempt the seller from bearing the risk of unacceptable quality, is void under Australian Consumer Law, s 64(1). In addition, it may also be void because it is unfair under the Unfair Contract Terms Law (Paterson **11.180**). The tests are different under the two regimes. In the first case, the "court will consider what the term purports to do and its effect," while in the second, a court "will apply the test for an unfair term" (Paterson **11.180**). Under the legislation, unfair terms are characterized as "imbalanced when they attempt to detract from the statutory rights held by consumers" and

therefore "lacking transparency" (Paterson **11.180**). A reasonable interpretation of the common law and reformulated statutory provisions taken as a whole, is that they are increasingly leading to outcomes that satisfy both the fairness and efficiency criteria.

(b) **The tort of negligence**

Fleming characterizes the function of torts law as ex post social risk management, "the law of torts then is concerned with the allocation of losses incident to man's activities in modern society, and the task confronting the law of torts is, therefore, how best to allocate these losses in the interest of the public good" (Fleming (1998), p. 3). Torts law achieves this by substituting liability rules, strict liability and negligence, for voluntary bargains between the parties. Since in common law jurisdictions negligence is comparatively much more important, the discussion will focus on this tort. Mendelson, a torts law scholar, interprets this species of action on the case in a risk management framework. She writes, "the rationale for the tort of negligence is two-fold: (1) to enable those wrongfully injured through the negligent conduct of others to obtain compensation from the injurers; and (2) to impose standards based on a duty to avoid creating risks, which may result in an injury to another. If there is no way of avoiding a particular risk, or of predicting whether or not it will materialise, then the risk ought to be disclosed to those who may be harmed by it" (Mendelson, p. 278). "At common law, to be successful in a cause of action in negligence, the plaintiff (victim) has to establish on the balance of probabilities that: (i) the defendant (injurer) owes him or her a duty of care; (ii) the defendant is at fault by breaching the duty of care, by falling below the standard expected of a reasonable person in the defendant's position; (iii) the defendant's breach factually caused the plaintiff's harm and (iv) the harm was reasonably foreseeable" (Mendelson, p. 281).

The second and third aspects of the common law of negligence (principles of breach and causation) have been recently modified by legislation in all of the Australian states. *The Civil Liability Act 1936* (SA), s 32 and 32(2); *Civil Liability Act 2002* (NSW), s 5B and 5B(2); *Civil Liability Act 2003* (Qld), s 11 and s 9(2); *Civil Liability Act 2002* (WA), s 5B and s 5B(2); *Civil Liability Act 2002* (Tas), s 11 and s 11(2); *Civil Law (Wrongs) Act 2002* (ACT), s 43 and s 43(2); and *Wrongs Act 1958* (Vic), s 48 and s 48(2) each provides that "(1) A person is not negligent in failing to take precautions against a risk of harm unless: (a) the risk was foreseeable (that is, it is a risk of which the person knew or ought to have known), and (b) the risk was not insignificant, and (c) in the circumstances, a reasonable person in the person's position would have taken those precautions. (2) In determining whether a reasonable person would have taken precautions against a risk of harm, the court is to consider the following (amongst other relevant things): (a) the probability that the harm would occur if care were not taken; and (b) the likely seriousness of the harm; and (c) the burden of taking precautions to avoid the risk of harm; and (d) the social utility of the activity that creates the risk of harm" (Mendelson 2010. **11.1.2**, **11.2**).

In a basic sense, these provisions bear some resemblance to the "lower cost precaution taker plus bearer of risk principle." Study of the cases on negligence, applying common law and the modifying statutory principles, is very valuable because it provides detailed guidance to the difficulties judges face in applying the criteria to complex individual risk management problems that arise in practice and how these might be resolved. The first HCA case to begin interpreting the new legislation, *Adeels Palace Pty Ltd v Moubarak* (2009) HCA 48 (2009) 239 CLR 420, is a good example. "The defendants as occupiers of a reception and restaurant business, owed a duty of care to two men, who while on the premises were shot by a gunman in December 2002. The gunman was one of the patrons, who initially came into the restaurant unarmed; however following a violent altercation on a dance floor, returned with a loaded gun and used it to shoot the plaintiffs" (Mendelson. **11.2.1.1**). "The High court of Australia was asked to decide, pursuant to s 5B of the NSW Civil Liability Act, whether the defendants had failed to take reasonable precautions against the risk posed by the gunman" (Mendelson. **11.2.1.1**). "Since the High Court found that the

plaintiffs had not established causation (see below), the issue was not decided, however the Court did provide guidance on the matter of reasonable precautions" (Mendelson. **11.2.1.1**).

First, given that harm has actually occurred, foreseeable risk has to be assessed before the event or activity occurs and not on the basis of what actually happens if the risk eventuates (Mendelson **11.2.1.1**). In this case, this was the probability of violence occurring at a reception and restaurant business, if "licensed security personnel who would act as crowd controllers or bouncers were not provided" (Mendelson **11.2.1.1**). Second, the foreseeable risk that is managed cost-effectively by taking precautions does not mean "general risks associated with certain activities" (the common law rule) but foreseeability of the specific risk "that called for, as a matter of reasonable precaution, the presence or physical authority of bouncers or crowd controllers to deal with it safely" (Mendelson **11.2.1.1**, p. 337). Third, "there is no liability unless factual causation is established by the plaintiff, and this 'is determined by the 'but for' test: but for the negligent act or omission, would the harm have occurred?" (Mendelson, **12.2.2.1**). In the Adeels case, French CJ, Gummow, Hayne, Heydon, and Crennan JJ found that factual causation had not been established. This was because the evidence did not establish "that security personnel could or would have prevented re-entry by the gunman: a determined person armed with a gun and irrationally bent on revenge" (Mendelson, **12.2.2.1**). Since the court found for the defendants, they had impliedly managed risk optimally.

Credit Market Negative Externalities and Systemic Risk

Financial, or more specifically credit markets, only manage an individual's or businesses' financial risk optimally, if none of the cognitive biases infect their choices. However they will not manage aggregate financial risk optimally, because market forces generate financial cycles arising from financial system-induced negative externalities. This stricture also applies even if all decision makers are perfectly rational in the economic

sense. Failures in credit markets give rise to systemic risk, the risk that the entire financial system will collapse. Downturns in financial cycles are known as "balance sheet recessions" and differ from business (inventory or inflation) cycles (BIS 2014. Box 111.A, p. 45; Chapter 4, p. 65). Balance sheet-induced cycles "tend to be much longer than business cycles, and are best measured by a combination of credit aggregates and property prices" (BIS 2014, p. 65). "On average it takes about four and a half years for per capita output to rise above its pre-crisis peak. The recovery of employment is even slower" (BIS 2014 Box 111.A, p. 45).

Rising prices in asset markets (land, housing, and equities) that no longer reflect underlying true determinants of economic value such as land scarcity usually portend emerging and troublesome market bubbles. The cause of the 1930s depression was the bursting of the stock market bubble in 1929 and the widespread bank failures and deflation that followed. High economic growth in the 1920s drove the share market upward, and banks willingly financed most of the purchase price of share portfolios. The latest example of a debt-driven severe economic downturn, and accompanying bank failures caused by bursting bubbles, is the 2008 so called GFC, which began in the United States and then subsequently spread throughout many European economies. Ball (2014) has estimated the weighted average loss in potential output for 23 countries including the United States from the "Great Recession" as being 7.2% in 2013, increasing to 8.4% in 2015 (Greece, Hungary, and Ireland >30% and the United States 5.3%). In terms of 2015 US dollars, the 8.4% loss translates into $4.3 trillion (Ball 2014, p. 5).

At the dawn of the twenty-first century, another stock market bubble burst. However this was eclipsed by a boom in real housing prices that had emerged in the mid-1990s and led The Economist magazine in 2005 to describe it as "the greatest bubble in history" (Garnaut and Llewellyn-Smith, p. 11). In 1999 in America, the Clinton administration wanted to increase home ownership among poorer members of the community. This was to be achieved by lowering interest rates through expansion of the money supply and giving the mortgage providers Fannie Mae

(Federal National Mortgage Association) and Freddie Mac (Federal Home Loan Mortgage Corporation) incentives to make loans to subprime borrowers, who being poor credit risks could not borrow in conventional capital markets (Garnaut and Llewellyn-Smith, p. 20). Incentives included tax breaks and the ability to securitize subprime loans. Securitization is a "practice through which an illiquid but income producing asset is converted into a security more easily traded by investors" (Garnaut and Llewellyn-Smith, p. 41). It "shifts and repackages risk but does not eliminate it" (Garnaut and Llewellyn-Smith, p. 41). "The securitization process was insured often by selling a guarantee called a credit default swap (CDS)" (Garnaut and Llewellyn-Smith, p. 51).

"Credit analysts at JPMorgan invented the CDS" (Garnaut and Llewellyn-Smith, p. 40). A CDS transfers the risk that a debtor will not repay a loan from the creditor to an insurer, in this instance, "risk was shifted from company to company; one paid the other to absorb the risk of default" (Garnaut and Llewellyn-Smith, p. 65). As a consequence, sellers of these instruments were encouraged to take even greater risks, instead of properly managing their balance sheets to ensure that they could meet their financial obligations. "Being over the counter derivatives, these transactions were hidden from regulators and the wider market of investors" (Garnaut and Llewellyn-Smith, p. 66). A CDS is a class of interconnecting derivative. Garnaut and Llewellyn-Smith, p. 66 write: "During the crash of 2008, when confidence was tested, the risk that had been shifted from thousands of individual companies suddenly became a risk to the entire system. Because nobody knew where the risk lay, everyone was suspect." The crunch came when US Federal Reserve officials pursued a sharp contractionary monetary policy to break the real estate bubble, and the supply of credit rapidly contracted. There was a sharp rise in mortgage defaults and foreclosures. Since securitized mortgages had been bought all over the world, overseas financial institutions and investors were also impacted.

"A principal cause of the GFC was the policies of the U.S. monetary and regulatory authorities" (Stiglitz 2012). Poorly designed government policy and regulatory failure gave critical decision makers in financial institutions perverse incentives, which contributed to severe credit market failures, and widespread externalized costs. They also fuelled the increasingly irrational speculative activity that was driving house prices upward. Three negative externalities have been identified in the literature: (i) strategic complementarities, (ii) fire sales, and (iii) interconnectedness. The first category arises due to vigorous competition between financial institutions and increasing adverse selection problems, lowering profits from loans as the upswing of the cycle gathers momentum. The outcome is that all institutions tend to engage in the same risky lending practices, thereby acquiring virtually the same "toxic" loan portfolios. Fire sale externalities come into play when the bubble has burst. Widespread asset sales at prices below fundamental economic values during times of financial distress cause asset prices to decline adversely, impacting all financial intermediaries' balance sheets. The Bank of England describes the source of these two externality categories as "collective overexposure of the financial system in the upswing of the credit cycle, and excessive risk aversion in the downswing" (Bank of England, p. 10). Interconnectedness externalities arise from "the rapid dissemination of shocks between interconnected financial institutions" (De Nicolo' et al. 2012, pp. 4–5). "A network of large multinational based and interlinked financial institutions, while mitigating the impact of small shocks by spreading them, seems to amplify large shocks because they can reach more counterparties" (De Nicolo' et al. 2012, p. 10). According to The Bank of England, the source of this network externality is "the distribution and concentration of risk within the financial system" (Bank of England, p. 15). The role that "interconnecting derivatives" such as CDSs played in transmitting shocks was illustrated in the previous paragraph.

Managing credit market negative externalities optimally, necessitates an absence of government regulatory failure plus macroprudential regulation of the financial system. This differs from microprudential regulation, which is designed to align principal (lending mangers)-agent (customers) incentives, given the difficulty agents confront in monitoring principals' lending activities. An

example of a solution is the minimum capital requirement of Australian banks. "If a deposit taking institution sustains loan losses in excess of its profits, it must write them off against capital, not against liabilities (depositors' funds). Consequently in order to deal with such a contingency, APRA (The Australian Prudential Regulation Authority) mandates that such an institution must hold at least 8% of its capital base (equity) in a stipulated form: shareholders' funds and retained earnings (Tier 1 capital), and certain types of preference shares (Tier 2 capital)" (Viney, pp. 89–90). However microprudential regulation does not by itself protect the integrity of the whole financial system. Furthermore, the whole behaves differently from its constituent parts. "Stabilising one institution can destabilise the whole system" (De Nicolo' et al. 2012, p. 7).

There are two ways of classifying macro-prudential policy tools. De Nicolo' et al. 2012, p. 11, describe these as: "capital requirements (surcharges), liquidity requirements; restrictions on activities, assets or liabilities, and taxation." The Bank of England 2011, p. 17, adopts the following groupings: "those that affect: (i) the balance sheets of financial institutions; (ii) the terms and conditions of loans and other financial transactions and (iii) those that influence market structures." Systemic financial system risk is either time varying, emanating from complementarity and fire sale externalities, or cross sectional, arising from interconnectedness externalities. "Balance sheet and loan restriction tools address dynamic risk, while market structure interventions target cross sectional risk" (Bank of England, p. 17). Generally regulation of capital buffers can potentially ameliorate all three externality categories (De Nicolo' et al. 2012, p. 14). Other examples of regulatory instruments are restrictions on bank asset allocations to limit asset growth in the upturn of the cycle, and adjustment costs in the downturn, (De Nicolo' et al. 2012, p. 12) and the imposition of maximum leverage ratios (Bank of England, p. 17).

Conclusion

In this entry, while financial has been distinguished from operational risk, they are both managed optimally in the same way, through "cost-benefit" assessments. Doing so will result in risk being reduced, eliminated, or fully borne by the decision maker. In order to implement these "optimization rules," rational behavior on the part of individuals, which implies an absence of cognitive biases, is necessary. This stringent requirement is rarely met in practice, and government paternalistic risk management is often observed. An example is outright prohibition of the consumption of harmful drugs. In addition, the common law principles of contractual exemption clauses and negligence both complement paternalistic policies. The first does this by targeting unfair risk-shifting contractual terms, while the second assesses, inter alia, the adequacy of the respective parties' precautions, after an accident has occurred.

The optimal management of systemic risk or total financial system collapse requires an absence of government regulatory failure plus robust prudential regulation. An example would be the imposition of capital controls between countries. Unimpeded market forces generating credit market negative externalities will usually fail to ensure that the economy's aggregate exposure to risk is optimal over the course of the business or inventory cycle. Financial system credit creation, during cyclical upswings, fuels increasing asset prices, balance sheet leverage, and the outcome is excessive exposure to suboptimal amounts of aggregate risk. Similarly, during the downswing of the cycle, credit withdrawal, deleveraging, and asset price declines can generate disproportionate output and employment losses that are "extraordinarily long lasting" (BIS, p. 7). Furthermore, "financial cycles can go largely undetected. They are simply too slow moving for policy makers and observers whose attention is focused on shorter-term output fluctuations" (BIS, p. 7).

References

Monographs

Clarke P, Clarke J, Zhou M (2008) Contract law: commentaries, cases and perspectives. Oxford University Press, South Melbourne

Fleming J (1998) The law of torts. LBC information services, 9th edn. LBC Information Services, North Ryde

Kahneman D (2011) Thinking fast and slow. Allen and Lane, New York

Knight F (1921) Risk, uncertainty and profit. Augustus M Kelley, New York

Mendelson D (2010) The new law of torts, 2nd edn. Oxford University Press, South Melbourne

Paterson J (2012) Unfair contract terms in Australia. Thomson Reuters (Professional) Australia, Pyrmont

Ritchie D, Reid S (2013) Risk management and ecotourism businesses. In: Ballantyne R, Packer J (eds) International handbook on ecotourism. Edward Elgar. Cheltenham, UK; Northampton, MA

Seddon N, Ellinghaus M (2008) Cheshire and Fifoot's law of contract. Ninth Australian edn. LexisNexis Butterworths. Chatswood, NSW

Thaler R, Sunstein C (2008) Nudge: improving decisions about health, wealth and happiness. Yale University Press, New Haven

General References

Bank of England (2011) Instruments of macroprudential policy. A discussion paper

Bank for International Settlements (BIS) (2014) 84th annual report.

De Nicolo' G, Favara G, Ratnovski L (2012) Externalities and macroprudential policy. IMF discussion note. 7 June 2012. International Monetary Fund

Garnaut R, Llewellyn-Smith D (2009) The great crash of 2008. Melbourne University Press, Carlton

Stiglitz J (2012) Macroeconomics, monetary policy and the crisis, Chap. 4. In: Blanchard O, Romer D, Spence M, Stiglitz J (eds) In the wake of the crisis: leading economists reassess economic policy. The MIT Press, Cambridge, MA

Viney C (2011) Financial market essentials. McGraw Hill, North Ryde

Journal Articles

Ball L (2014) Long-term damage from the great recession in OECD countries. NBER working paper no 20185. Issued May 2014

Tversky A, Kahneman D (1981) The framing of decisions and the psychology of choice. Sci New Ser 211(4481): 453–458

Robbery

▶ Piracy, Modern Maritime

Röpke, Wilhelm

Stefan Kolev
Wilhelm Röpke Institute, Erfurt and University of Applied Sciences Zwickau, Zwickau, Germany

Abstract

The purpose of this entry is to delineate the political economy of Wilhelm Röpke. To reach this goal, a history of economics approach is harnessed. First, the entry concisely reconstructs Röpke's life, intellectual evolution, and heritage. Second, it presents the specificities of his perspective on economic embeddedness focused on the stability of social order and on the role of informal institutions as indispensable stabilizers of this order.

Biography

Wilhelm Röpke (1899–1966) was a key figure within a fascinating generation of European economists. Even though not as widely received today as his colleagues and friends F.A. Hayek (1899–1992) and Walter Eucken (1891–1950), Röpke and his age peers had the mixed privilege to experience two world wars, but also the intellectual privilege to be among the most renowned economists in Europe during the period of the Great Depression as well as in the postwar decades. Röpke's vibrant life, his scholarly achievements as political economist and as social philosopher, but also his seminal role in shaping economic policy at several crucial junctures more than vindicate a detailed portrayal, with the main aim to show how he complements the ordoliberalism of the Freiburg School by his specific research program within the ordoliberal paradigm.

Röpke was born in a small town in the Northwest of Germany and retained a lifelong sympathy for rural, small-scale social contexts like the one of his youth. He studied a combination of economics, law, and administrative science at Tübingen, Göttingen, and Marburg. Having

completed both a (historicist) dissertation and a (theoretical) habilitation at Marburg, Röpke moved to Jena to become Germany's youngest professor at the age of 24 (Gregg 2010, pp. 7–8; Hennecke 2005, pp. 49–53). After a brief stay at Graz, he received a call to Marburg in 1929 and stayed there until 1933, but had to leave almost immediately after the National Socialist seizure of power because of his perennial outspoken opposition (Nicholls 1994, pp. 56–59; Hennecke 2005, pp. 99–114). Röpke and his close associate Alexander Rüstow (1885–1963) received positions at Istanbul, together with several other German émigrés. Both were eager to come back to Central Europe, and Röpke was lucky to receive a call in 1937 to the Graduate Institute of International Studies in Geneva, where he remained for the rest of his life.

Unlike Eucken or his Viennese colleagues, Röpke was not the type of scholar to form a school of his own (Boarman 1999, pp. 69–73) – instead, he was a highly gifted networker and succeeded soon to set up an international network connecting various European countries, one to be expanded after 1945 to the Americas (Zmirak 2001, pp. 201–206). Röpke and Rüstow were among the most active figures at the Colloque Walter Lippmann in Paris 1938, the birthplace of "neoliberalism" – a term with a history reaching well into the nineteenth century, but now to be used for a reformulation of liberalism by twentieth-century social scientists (Gregg 2010, pp. 82–86; Burgin 2012, pp. 67–78). Along with Hayek, Röpke acted in the immediate postwar years as the second initiator of the 1947-founded Mont Pèlerin Society, a hub for the few remaining liberal scholars, until that point isolated at their individual locations in Europe and the United States (White 2012, pp. 233–238; Kolev et al. 2014). Simultaneously, Röpke functioned as a crucial "spin-doctor" to Ludwig Erhard and was the mastermind behind some of Erhard's strategic plans for postwar Germany under the auspices of the Social Market Economy (Commun 2004; Goldschmidt and Wohlgemuth 2008, pp. 262–264). However, Röpke's enthusiasm for the effects of the "economic miracle" faded away during the 1950s, leading to a deepening pessimism about the prospects of liberty, in combination with voicing ever-sharper conservative positions on social issues. After the "Hunold affair" within the Mont Pèlerin Society, a fall-out with Hayek and the American fraction in the Society ensued (Plickert 2008, pp. 178–190; Burgin 2012, pp. 137–143), with further detrimental effects for Röpke's weakened health leading to his passing away in February 1966.

Even though not as prominent in today's policy debates in Germany as authors like Eucken or Keynes, Röpke is frequently present in the official addresses of Chancellor Merkel or of finance minister Wolfgang Schäuble. In 2007, the Wilhelm Röpke Institute was established in Erfurt, close to Röpke's first professorship at Jena. Also, Röpke has been more widely received and discussed than Eucken in some other European countries (especially Switzerland and Italy) as well as in conservative circles in the United States (Commun and Kolev 2018).

The Political Economist Is More Than Just an Economist

Röpke's impulses to the research program of the incipient neoliberal movement in the 1930s and 1940s are seminal – and often overlooked today. Despite their worsening relationship in the late 1950s amid the tensions in the Mont Pèlerin Society, Hayek acknowledged how Röpke had realized "early, probably earlier than most of our contemporaries, that an economist who is only an economist cannot be a good economist" (Hayek 1959, p. 26). And this is indeed characteristic for Röpke's oeuvre: in line with Eucken's concept of the "interdependence of orders," Röpke conceived a theory of the economy as an entity deeply embedded in and interrelated with adjacent social orders (Kolev 2013, pp. 121–136, 2015, pp. 424–427). Two issues are of paramount importance for his specific take on ordoliberal political economy: first his overarching concern with the stability of the economic order as embedded in society, and second his particular attention to what one would call today "informal institutions" – the particular cultural perquisites

R

and preconditions which to Röpke were more important for enabling stability than the formal legal rules framing the economy (Zweynert 2013, pp. 116–120). His focus on these two domains, stability and informal institutions, provides a valuable complement to the ordoliberal research program of the Freiburg School, and these domains also offer a helpful structure for continuing this exposition.

Stability Is Not to Be Taken for Granted: On the Fragility of the Spontaneous Order

Following up on Hayek's assessment above, Röpke can often be seen as prescient – both in his conceptual apparatus and his theoretical arguments. For example, he used the term "spontaneous order" as a description for the market in 1937, years before it explicitly found its key place in Hayek's terminology (Röpke 1963, p. 4). However, Röpke was also early to express serious concerns about the fragility of this order and to found his political economy on the issues of stability. The initiation was the Great Depression when he conceptualized, within the Austrian Business Cycle Theory, a phase of "secondary depression" during a slump of the economy: here, the useful effects of the "primary depression" with its merits in purifying the economy of the malinvestments of the boom are depleted – and the dangerous aspects of the depression start spreading, as its deflation becomes omnipresent (James 1986, pp. 329–342; Kolev 2013, pp. 178–183). The main danger here according to Röpke is not an economic one, rather it is rooted in the interdependence of the economic and the political order: The popular sentiments of unstoppable downward dynamics can in his analysis delegitimize not only the market economy as an economic order but also democracy as a political order and the free order of society as a whole (Röpke 1932, 1936, pp. 129–132). It was because of this notion of interdependence that Röpke, in contrast to his Austrian friends (Haberler 2000), pleaded in the early 1930s for active policy responses to stop the disintegration of the political order due to illiberal extremisms of various kinds.

Again, Hayek later acknowledged publicly the correctness of Röpke's broad perspective at this key juncture and also confessed his own narrowness in judging the harm of deflation only on purely economic criteria (Magliulo 2016).

In the decades to follow, Röpke expanded comprehensively on this early intuition of the crucial importance of stability in a system of interdependent social orders. In his trilogy published in German during the war (Röpke 1948, 1950, 1959), he searched for a diagnosis of the multiple crises of his age, for a therapy for them in Europe, and also for a solution set for the pressing issues in the international economic relations (Sally 1998, pp. 133–147). He explored a specific normative vision of the market within society, later to be called a "humane economy" in the English title of his probably most well-known book today (Röpke 1960), a vision to be depicted below. In the course of these endeavors, he left technical economics aside and moved increasingly into the domain of social philosophy, a parallel evolution observable in many of his age peers (Blümle and Goldschmidt 2006).

Informal Institutions, Not the Legal Framework Are the Key to Long-Term Stability

While the ordoliberalism of the Freiburg School focuses on the order-generating properties of the formal rules framing the economic process, the specifically Röpkean agenda within the "order in liberty" program of ordoliberalism is differently nuanced. Without disregarding the crucial role of formal legal institutions as a necessary condition for a stable system of social orders, Röpke's political economy did not perceive them as a sufficient condition. Rather, in an implicit division of labor with his Freiburg colleagues, Röpke underscored in his writings the essentiality of what he called the "anthropological and sociological" preconditions or prerequisites of a stable social order with a high degree of social cohesion (Röpke 1950, pp. 191–194, 1960, pp. 74–89). These cultural preconditions are partially ideal (called above "anthropological") and relate to necessary values within the intellectual heritage of Christianity, and

partially they also have a material side (called above "sociological") and depict the necessary social structures within which a "humane economy" is possible (Röpke 1960, pp. 222–235). Here an interesting contrast to Hayek can be drawn: while Hayek is primarily concerned with the threat which the logic of the small group can inflict on the mechanisms of the extended order of society, Röpke worries most about the opposite, i.e., about the threats stemming from "enmassment" where the logic of anonymous society uproots the individuals from the contexts of their traditional small communities and their particularly reliable social cohesion (Kolev 2016, pp. 16–20). Correspondingly, retaining and conserving these small contexts both in terms of economy and of society is the central goal of his "humane economy," thus preventing the individuals from falling prey to ideational vacuum or to unnatural social structures – and as the market tends to use up the resources of its stabilizing pillars, these are to be permanently checked and, if necessary, stabilized anew by the state and other players in civil society (Röpke 1942, pp. 67–71).

This Röpkean plea for specific informal institutions to guarantee stability has often been criticized as romantic, naively conservative, or even "retro-utopian" (Solchany 2015, pp. 484–501). While these critiques for Röpke's therapies do not fully lack justification, Röpke's diagnosis regarding the fragility inherent in "spontaneous orders" can claim validity until today, in the global economic order and, most recently, also in the political order of Western societies. It will be intriguing to observe to what extent the age of digitalization with platforms like social media can partially bring back to relevance the logic of small groups and the stabilizing statics which Röpke expected from these groups, in this way possibly providing an antidote to the "too much" of dynamics which discontented fractions of Western societies attest to the processes of globalization.

Cross-References

- ► Austrian School of Economics
- ► Böhm, Franz
- ► Constitutional Political Economy
- ► Eucken, Walter
- ► Hayek, Friedrich August von
- ► Mises, Ludwig von
- ► Ordoliberalism
- ► Political Economy
- ► Schmoller, Gustav von

References

Blümle G, Goldschmidt N (2006) From economic stability to social order: the debate about business cycle theory in the 1920s and its relevance for the development of social order by Lowe, Hayek and Eucken. Eur J Hist Econ Thought 13(4):543–570

Boarman P (1999) Apostle of a humane economy: remembering Wilhelm Röpke (1899–1966). ORDO Jahrb Ordn Wirtsch Ges 50:69–91

Burgin A (2012) The great persuasion: reinventing free markets since the depression. Harvard University Press, Cambridge, MA

Commun P (2004) Erhards Bekehrung zum Ordoliberalismus: Die grundlegende Bedeutung des wirtschaftspolitischen Diskurses in Umbruchszeiten. Discussion paper 04/04, Walter Eucken Institut, Freiburg

Commun P, Kolev S (eds) (2018) Wilhelm Röpke (1899–1966): a liberal political economist and conservative social philosopher. Springer, Heidelberg

Goldschmidt N, Wohlgemuth M (2008) Social market economy: origins, meanings, interpretations. Constit Polit Econ 19(3):261–276

Gregg S (2010) Wilhelm Röpke's political economy. Edward Elgar, Cheltenham

Haberler G (2000) Between Mises and Keynes: an interview with Gottfried von Haberler (1900–1995). Austrian Econ Newsl 20(1.) Available at: https://mises.org/library/between-mises-and-keynes-interview-gottfried-von-haberler

Hayek FA (1959) Glückwunschadresse zum 60. Geburtstag von Wilhelm Röpke. In: Röpke W (ed) Gegen die Brandung. Eugen Rentsch, Zurich, pp 25–28

Hennecke HJ (2005) Wilhelm Röpke: Ein Leben in der Brandung. Schäffer-Poeschel, Stuttgart

James H (1986) The German slump: politics and economics 1924–1936. Clarendon, Oxford

Kolev S (2013) Neoliberale Staatsverständnisse im Vergleich. Lucius & Lucius, Stuttgart

Kolev S (2015) Ordoliberalism and the Austrian school. In: Boettke PJ, Coyne CJ (eds) The Oxford handbook of Austrian economics. Oxford University Press, Oxford, pp 419–444

Kolev S (2016) Stresstest fürs globale Dorf. Schweizer Monat 1037:16–21

Kolev S, Goldschmidt N, Hesse J-O (2014) Walter Eucken's role in the early history of the Mont Pèlerin Society. Discussion paper 14/02, Walter Eucken Institut, Freiburg

Magliulo A (2016) Hayek and the great depression of 1929: did he really change his mind? Eur J Hist Econ Thought 23(1):31–58

R

Nicholls AJ (1994) Freedom with responsibility. The social market economy in Germany, 1918–1963. Clarendon, Oxford

Plickert P (2008) Wandlungen des Neoliberalismus: Eine Studie zu Entwicklung und Ausstrahlung der "Mont Pèlerin Society". Lucius & Lucius, Stuttgart

Röpke W (1932) Krise und Konjunktur. Quelle & Meyer, Leipzig

Röpke W (1936) Crises and cycles. William Hodge, London

Röpke W (1942) International economic disintegration. William Hodge, London

Röpke W (1948) Civitas humana: a humane order of society. William Hodge, London

Röpke W (1950) The social crisis of our time. University of Chicago Press, Chicago

Röpke W (1959) International order and economic integration. D. Reidel, Dordrecht

Röpke W (1960) A humane economy: the social framework of the free market. Henry Regnery, Chicago

Röpke W (1963) Economics of the free society. Henry Regnery, Chicago

Sally R (1998) Classical liberalism and international economic order: studies in theory and intellectual history. Routledge, London

Solchany J (2015) Wilhelm Röpke, l'autre Hayek : Aux origines du néolibéralisme. Publications de la Sorbonne, Paris

White LH (2012) The clash of economic ideas. The great policy debates and experiments of the last hundred years. Cambridge University Press, Cambridge

Zmirak J (2001) Wilhelm Röpke: Swiss localist, global economist. ISI Books, Wilmington

Zweynert J (2013) How German is German neoliberalism? Rev Austrian Econ 26(3):109–125

Rothbard, Murray

Karl-Friedrich Israel
Faculty of Economics and Business
Administration, Humboldt-Universität zu Berlin,
Berlin, Germany
Department of Law, Economics, and Business,
University of Angers, Angers, France

Abstract

Murray Newton Rothbard (2 March 1926 in New York City–7 January 1995 in New York City) was a libertarian philosopher and one of the most influential adherents to the Austrian School of economics in the recent past. Building on the economic theory of his mentor Ludwig

von Mises (1881–1973), he made major contributions in different areas of economics, especially in the fields of marginal utility theory, welfare economics, monetary theory, business cycle theory, and the history of economic thought. Rothbard's economic theory is comprised in his opus magnum *Man, Economy and State*, published in 1962. The addendum *Power and Market* contains an economic theory of the state. He also made notable contributions in libertarian ethics and anarchist philosophy. He launched and spearheaded the modern libertarian and anarcho-capitalistic movement in the United States and attracted many intellectual followers worldwide, such as Walter Block (born 1941), Gary North (born 1942), Hans-Hermann Hoppe (born 1949), Joseph T. Salerno (1950), and Jörg Guido Hülsmann (born 1966).

Definition

Murray N. Rothbard (1926–1995) was a libertarian political philosopher and an economist in the tradition of the Austrian School of economics.

Life, Work, and Influence of Murray N. Rothbard
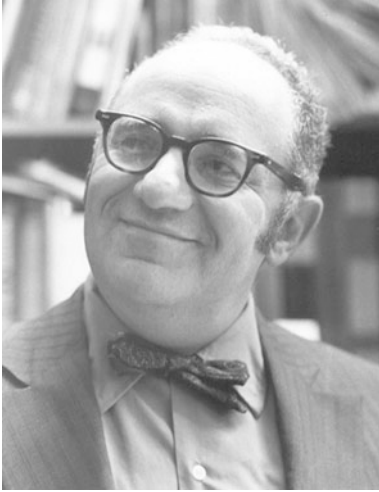
Life, Family, and Personal Background

Murray Newton Rothbard was born on March 2, 1926 in New York City as the only child of David and Rae Rothbard, who were Jewish immigrants from Poland and Russia, respectively. Rothbard was born in the Bronx. He and his family later moved to the Upper West Side of Manhattan into a rent-controlled apartment. Rothbard initially went to a public school, where he caused massive trouble for his parents, colleagues, and teachers (Rothbard 1981). After the move to Manhattan, he happily entered Birch Wathen, a private school founded in the early twentieth century. His winning one of the scholarships that were awarded to poor and middle-class boys in order to increase the ratio of boys to girls enabled him to attend (Flood 2008).

Murray Rothbard, with permission from *Mises Institute* in Auburn, AL, USA

After finishing high school, he entered Columbia University in the fall of 1942 at the age of 16. As surprising it might seem in light of his aversion to mathematical economics, Rothbard was at one time in college a statistics major. He was an excellent student and apparently attracted the attention of recruiters for the Manhattan Project. Whether it actually led to a job offer or not is unknown. Rothbard was found to be unfit for military services (4-F) which exempted him from the draft during World War II (Flood 2008). He graduated in 1945 and enrolled in a graduate course in mathematical statistics with the famous statistician and economist Harold Hotelling (1895–1973), who was at the time a member of the faculty at Columbia University (1931–1946). However, disillusioned with Hotelling's lectures, he walked "out of the world of statistics, never to return" (Rothbard 2006, pp. 28–29). His main interests shifted to the social sciences. In 1946 he received the M.A. degree in economics.

According to Rothbard, growing up as a middle-class Jew in the 1930s and 1940s in New York City meant that literally everybody he knew – "friends, relatives, acquaintances, whatever — was either a Communist Party member or else was thinking about whether they should join it." He had "four aunts and uncles who were Communist Party members and another two or three or four were pondering whether or not to join" (Rothbard 1981). His father had significant influence on him at that time as he was strongly opposed to the Communist Movement. So was Rothbard. In retrospect, he called his father "the first libertarian he knew" (Rothbard 1981). His parents met at an anarchist dance, and at some point his father probably was an active anarchist but decided to stop political action, when he found out that his friends, who were strongly opposed to World War I, had been arrested. From then on, he focused solely on his work as a chemist. One of the first books on anarchism that Rothbard read from the library of his father was Paul Eltzbacher (1908). He found it to be interesting and "exotic." However, he was not yet converted to anarchism as he was only about 10 years old (Rothbard 1981). This would happen some years later.

Rothbard was elected a member of *Phi Beta Kappa* and remained at Columbia University to pursue a Ph.D. in economics under the economic historian Joseph Dorfman (1904–1991). His thesis was entitled The Panic of 1819 (Rothbard 1962) and it is until today the standard work on this particular economic crisis (Gordon 2007, p. 12). It took 10 years until he was awarded the doctorate degree in 1956 due to disagreements between Arthur Burns (1904–1987) and Dorfman. Burns, then professor at Columbia University and chairman of the Council of Economic Advisors (1953–1956), later chairman of the Federal Reserve (1970–1978), and ambassador to West Germany (1981–1985), lived in the same building as Rothbard. David Rothbard asked him to have a look at his son at the university, but it was Burns who brought his academic career to a virtual halt by telling Dorfman that he would "expect much more from Rothbard." JoAnn Schumacher, who became Rothbard's wife and close collaborator, found him one day sobbing at the doorsteps of his house, disheartened by Burns' obstacles (Flood 2008). Arthur Burns, Wesley Clair Mitchell (1874–1948), and John Maurice Clark (1884–1963) were among the most important professors at the faculty. They looked skeptically at economic theory and accepted the

R

institutionalist doctrine which conceives of economic theory as only relative to particular historical situations but not as universally true. Rothbard followed Columbia philosopher Ernest Nagel (1901–1985) and his criticism of institutionalism for its opposition to economic theory (Gordon 2007, pp. 9–11). This was an insurmountable conflict between Rothbard and Burns. It was not the only time that he was facing intellectual opposition. However, he would rarely compromise and deviate from a position that he deemed correct.

When Rothbard entered graduate school, there were a peak number of students due to the returning troops, the vast majority of which were social democrats or even communists and in anyway disapproved of the free market. At that time George Stigler (1911–1991), later Nobel Prize laureate (1982) of the Chicago school of economics, arrived at the campus (1947–1958). His first two lectures were on the evils of rent control and minimum wages, which led to some hysteria among the students (Rothbard 1981). To the intellectual relief of Rothbard, Stigler was not averse to economic theory. Through one of his pamphlets, written together with Milton Friedman (1912-2006) (Stigler and Friedman 1846), Rothbard encountered the Foundation for Economic Education. He contacted the group and made the acquaintance of founder Leonard E. Read (1898–1983); F. A. Harper (1905–1973), founder of the Institute for Humane Studies in 1961; and most importantly Ludwig von Mises (1881–1973), who immigrated to the United States in 1940. His radical defense of the free market, and in particular his book *Human Action,* published in 1949 had a profound effect on Rothbard's thinking. Rothbard participated regularly in Mises's seminar at New York University, for which he delivered a number of articles which were partly published in his later works. Mises became Rothbard's mentor, although they would not agree on everything, for example, the proper role of the state. Mises, as a classical liberal, advocated a state strictly confined to the protection of private property rights through a court and police system. Rothbard, however, went one step further and denied the necessity of the state

altogether. In this persuasion he was influenced by nineteenth-century individualist anarchists, such as Lysander Spooner (1808–1987), Benjamin Tucker (1854–1939), and Gustave de Molinari (1819–1912) (Gordon 2007, p. 13).

In terms of economic theory, Rothbard and Mises would only disagree on minor aspects but generally appreciate and admire each other's works. The William Volker Fund, which gave financial support to classical liberal scholars, commissioned Rothbard to write a textbook, which would explain Mises (1998) to college students. Something much larger would originate out of this project – his opus magnum *Man, Economy and State*, published in 1962, one of the most important contributions to Austrian economics in the past century (Hoppe 1999). Ludwig von Mises called Rothbard's treatise:

> an epochal contribution to the general science of human action, praxeology, and its practically most important and up-to-now best elaborated part, economics. Henceforth all essential studies in these branches of knowledge will have to take full account of the theories and criticisms expounded by Dr. Rothbard. (Mises 1962)

Only one year later, in 1963, appeared *America's Great Depression*, in which Rothbard applied *Austrian Business Cycle Theory* as laid down by Mises (1912) to the great economic crisis of the 1930s. He worked for different institutions and foundations and published scientific and nonscientific articles, comments, and reviews in various journals and magazines. From 1966 to 1986, Rothbard taught economics at the Brooklyn Polytechnic Institute, an engineering school without a major program in economics.

Although Rothbard was an agnostic and a secularist, he became a columnist for a little rightwing magazine written for protestant ministers called *Faith and Freedom* under the pseudonym Aubrey Herbert. He was criticized by the constituents for being a communist, as he was opposing the Eisenhower administration for its "statist plans" and "attacking the idea that we should spend every drop of American blood supporting Chiang Kai-shek" (Rothbard 1981). Rothbard was against military interventions and conscription, and he favored the free market in all areas of

social cooperation. This is why he in fact considered himself to be an extreme version of the members of the "Old Right," a movement that evolved in reaction to American entry into World War I (1917), and the New Deal (1933–1938), which Rothbard identified in his book *The Betrayal of the American Right*. The "Old Right" included authors and journalists, such as Albert Jay Nock (1870–1945), H. L. Mencken (1880–1956), Garet Garrett (1878–1954), Robert Taft (1889–1953), Frank Chodorov (1887–1966), and John T. Flynn (1882–1964) whose works played a crucial role in Rothbard's intellectual development. It was not the only time that Rothbard was red-baited by people on the Right, since, although being an ardent critic of communism, he opposed the global military campaign against it. In his opinion, the battle should be won intellectually and not by means of violent force, and it should be fought against statism in general and not communism in particular. Rothbard even cooperated with members of the New Left in the 1960s looking for allies in his fight against war. For him, this became the most important issue of all. As he noted privately in 1956: "I am getting more and more convinced that the war-peace question is *the key* to the whole libertarian business" (as cited in Payne 2005). Rothbard appreciated the works of New Left historian William Appleman Williams (1921–1990) and in particular his foreign policy analysis and his advocacy of decentralization in domestic affairs. In retrospect, however, he thought that the alliance with the New Left was a mistake. He wrote:

> We came to realize that, as Marxian groups had discovered in the past, a cadre with no organization and with no continuing program of "internal education" and reinforcement is bound to defect and melt away in the course of working with far stronger allies. The libertarian groupings would have to be rebuilt as a self-conscious movement, and its major emphasis would have to be on nourishing, maintaining, and extending the libertarian cadre itself. (Rothbard 2007, p. 202)

This is exactly what Rothbard did toward the end of his career. He published *For a New Liberty: The Libertarian Manifesto* in 1973, in which he applied libertarian philosophy to the social and economic problems of our time and thereby founded the modern libertarian movement (Block and Rockwell 1988). His philosophical opus magnum *The Ethics of Liberty* appeared in 1982. In addition to his contributions in economic theory and philosophy, he wrote a four-volume history of colonial America, *Conceived in Liberty*, and a two-volume *Austrian Perspective on the History of Economic Thought*, tracing the history of economics from the ancient Greeks to the classical economists, such as Adam Smith (1723–1790) and David Ricardo (1772–1823), as well as the French school of classical liberalism and Marxism. He was working on a third volume on more recent developments at the time of his death. He did not finish it.

Rothbard only obtained a full professorship in 1986, as S. J. Hall Distinguished Professor of Economics at the University of Nevada, Las Vegas (UNLV), a university without a graduate program in economics, which meant that throughout his academic career Rothbard was prevented from claiming a single doctoral student as his own (Hoppe 1999). At UNLV, he closely collaborated with Hans-Hermann Hoppe, one of his most influential disciples, until his death on the 7th of January 1995. Despite his unconventional and radical beliefs, he probably could have obtained a full professorship earlier in his career. However, according to Gary North (2010), he suffered from phobia about leaving Manhattan Island, which he could only overcome toward the end of his life.

Academic Work and Influence
Murray N. Rothbard published his opus magnum in the area of economics, *Man, Economy and State*, in 1962, as a relatively young economist of only 36 years. With this volume, he occupied a very, if not the most, influential position within the tradition of the Austrian School of economics in the second half of the twentieth century – although Nobel Prize-winning economist Friedrich August von Hayek (1899–1992) is commonly considered to be the most important representative of this school of thought. However, Hayek is strictly speaking not an adherent to the rationalist mainstream of Austrian economics as espoused by Carl Menger (1840–1921), Eugen von Böhm-Bawerk

R

(1851–1914), Ludwig von Mises, and Murray N. Rothbard but rather its explicit opponent. He stands in the tradition of British empiricism and skepticism (Hoppe 1999). Like his intellectual forerunners, Rothbard is an "outspoken rationalist and critic of all variants of social relativism: historicism, empiricism, positivism, falsificationism, and skepticism" (Hoppe 1999, p. 223). Rothbard interpreted economic theory as universally and *a priori* true and not only hypothetically valid. In his opinion, it is not subject to constant empirical testing against data. In other words, propositions in economics concern non-hypothetical relations and assume apodictic validity. As Mises in his *Human Action*, Rothbard deduced all his economic propositions from basic axioms. He wrote in the preface to the second revised edition of *Man, Economy and State*:

> The present work deduces the entire corpus of economics from a few simple and apodictically true axioms: the Fundamental Axiom of *action* – that men employ means to achieve ends, and two subsidiary postulates: that there is a *variety* of human and natural resources, and that leisure is a consumers' good. (Rothbard 2009, p. lvi)

Rothbard interpreted economic theory as the logical deduction from the proposition that men act. It is impossible to deny this fundamental axiom without running into a performative contradiction, since arguing against it would imply an act as described above – the conscious employment of means, i.e., once vocal chords, to achieve an end, i.e., the refutation of the axiom of action. It is therefore indisputably true. The validity of economic theory, therefore, rests solely on the validity of the axiom of action and the correct exercise of logical deduction and inference (Hoppe 1999). Hence, empirical testing of economic propositions becomes unnecessary. Economic data can illustrate the propositions but neither verify nor falsify them. Furthermore, Rothbard followed the strict epistemological and methodological individualism of Menger, Böhm-Bawerk, and Mises, that is, he acknowledged the necessity to explain all economic phenomena in terms of purposeful individual action. Only individuals have desires, and "[e]very 'holistic' and 'organistic' explanation must be categorically rejected as an unscientific pseudo-explanation" (Hoppe 1999, p. 224). Since human beings act under uncertainty, human action is always speculative, and therefore Rothbard considers mechanical explanations of social phenomena as inappropriate and unscientific. Human action is fundamentally different from the behavior of atoms and other objects considered in natural sciences.

Beyond Mises's framework, Rothbard made several contributions to Austrian economics. One of the most important is his clarification of marginal utility theory as well as the reconstruction of welfare economics and the theory of the state that he derived from it. Rothbard explained that the word "marginal" does not refer to increments of utility, but rather to the utility of increments of a good. The former would imply measurability of utility, whereas the latter does not. Increments of a good can be characterized in physical terms and can be measured. Utility, however, is completely subjective, cannot be measured, and exhibits only an ordinal character on one-dimensional subjective preference scales. It is furthermore subject to changes over time. Consequently, interpersonal utility comparisons and the application of the rules of arithmetic to the concept of utility are impossible, such as adding utilities together to obtain a measure of "social welfare." Rothbard took this logical conclusion from the subjective and ordinal character of utility seriously and developed a new version of welfare economics "based on the twin concepts of individual self-ownership and demonstrated preference" (Hoppe 1999, p. 228).

Self-ownership means that every person owns, or exclusively controls, his or her physical body. In every action the personal physical body serves as a means to achieve some end. Thereby, it is demonstrated that the physical body is valued as *good*, and furthermore by doing one thing rather than another, it is demonstrated what is deemed the most highly valued end. In other words, the underlying ordinal preferences are demonstrated. Trading good A against good B demonstrates that good A is ranked higher on the subjective preference scale. For the trading partner, the opposite is true. Both parties expect to benefit from the transaction; otherwise it would not take place. As long

as individuals act, trade, and cooperate voluntarily and do not harm third parties, we might speak of Pareto-superior changes that lead to increases in subjective utility and hence in "social welfare." If transactions are brought about through coercion, at least one party is made worse off; otherwise it would have engaged in the transaction voluntarily. These changes are not Pareto superior. And it cannot be claimed that they lead to increases in social welfare, since losses and gains in utility cannot be compared. Noncontroversial examples would be criminal offenses, such as robbery and theft. However, also acts of the government, at least in part, classify as coercive. In fact, the power to coerce is the decisive characteristic of the state. Rothbard defined the state:

> as that organization which possesses either or both (in actual fact, almost always both) of the following characteristics: (a) it acquires its revenue by physical coercion (taxation); and (b) it achieves a compulsory monopoly of force and of ultimate decision making power over a given territorial area. (Rothbard 2002, p. 172)

Rothbard's conclusion is the refutation of the institution of government on welfare economic grounds. This of course made Rothbard an intellectual outlier, although his conclusion was implicitly accepted by many academics. As Hans-Hermann Hoppe points out:

> Scores of political philosophers and economists, from Thomas Hobbes to James Buchanan and the modern public-choice economists, have attempted to escape from this conclusion by portraying the state as the outcome of contracts, and hence, a voluntary and welfare-enhancing institution. (Hoppe 1999, p. 231)

Rothbard, however, would agree with Joseph Schumpeter (1883–1950) that "the theory which construes taxes on the analogy of club dues or of purchase of services of, say, a doctor only proves how far removed this part of the social sciences is from scientific habits of mind" (Rothbard 1997, p. 247; as cited in Hoppe 1999, p. 231).

Rothbard's monetary theory is also strongly influenced by the pioneering work of Ludwig von Mises. As he stated: "The Austrian theory of money virtually begins and ends with Mises's monumental Theory of Money and Credit"

(Rothbard 1997, p. 297). However, Rothbard made some additions and in particular generalized the Misesian theory by adopting a broader definition of the supply of money – "money includes whatever is redeemable at par in standard money" (Gordon 2007, p. 39). Mises introduced the so-called regression theorem which states that money as a generally accepted medium of exchange originates as a commodity money, such as gold, in the course of voluntary exchange and cooperation on the market. Rothbard added a theory of the destruction or devolution of money by the government that Hoppe called a "progression theorem" (Hoppe 1999, p. 237). Rothbard (2010) is an exposition of this theory and his views on money accessible for laymen and the general public. Rothbard (2008) and *The Case against the FED* (1994) contain similar ideas.

Rothbard applied Austrian business cycle theory, as formulated by Mises (1912) and Hayek (1967), to the Great Depression of the 1930s in his 1963 book *America's Great Depression*. Another source of influence for this volume was (Robbins 1971). In fact, Rothbard wrote in a letter to Ivan Bierly in 1959 that he considers Robbins's book to be "one of the great economic works of our time.... This is unquestionably the best work published on the Great Depression" (as cited in Gordon 2007, p. 42). Rothbard shows how the available empirical data supports the Austrian claim that artificial credit expansion leads to an inflationary boom, during which malinvestments are made, and the subsequent bust, in which the "cluster of business errors" becomes apparent (Rothbard 2000, p. 8). When central banks lower interest rates artificially, they make more investment projects look profitable than the subsistence fund, that is, the amount of real savings in the economy, can actually sustain. Hence, the structure of production is changed in an unsustainable manner as more investment projects are started than can be finished. The crisis constitutes the period, in which the necessary corrections take place, i.e., unprofitable investment projects are liquidated and, if not lost altogether, the remaining capital is reinvested into profitable lines of production. In Rothbard's own words:

R

In sum, businessmen were misled by bank credit inflation to invest too much in higher-order capital goods, which could only be prosperously sustained through lower time preferences and greater savings and investment; as soon as the inflation permeates to the mass of the people, the old consumption–investment proportion is reestablished, and business investments in the higher orders are seen to have been wasteful. Businessmen were led to this error by the credit expansion and its tampering with the free-market rate of interest.

The "boom," then, is actually a period of wasteful misinvestment. It is the time when errors are made, due to bank credit's tampering with the free market. The "crisis" arrives when the consumers come to reestablish their desired proportions. The "depression" is actually the process by which the economy adjusts to the wastes and errors of the boom, and reestablishes efficient service of consumer desires. The adjustment process consists in rapid liquidation of the wasteful investments. Some of these will be abandoned altogether (like the Western ghost towns constructed in the boom of 1816–1818 and deserted during the Panic of 1819); others will be shifted to other uses. (Rothbard 2000, pp. 11–12)

The current financial and debt crisis exhibits the same tendencies again. The ghost towns around Madrid in Spain are only one dramatic case in point for the wasteful employment of capital in the recent past. The current crisis has led to an increased interest in the Austrian theory of the trade cycle among laymen and professional economists alike, both in order to support and to criticize it (see, e.g., Caplan 2008). It is argued that the Austrian theory has more explanatory power than mainstream Neoclassical, Monetarist, or Keynesian accounts of the current crisis, which makes it attractive for young economists, but also a challenge for economists of other schools of thought. Rothbard's work and influence has played a major role in this development.

Rothbard was cofounder of the *Ludwig von Mises Institute* in Auburn, Alabama, together with Llewellyn H. Rockwell Jr. (born 1944) and Burton Blumert (1929–2009). Today, the institute promotes the ideas of Ludwig von Mises and Murray N. Rothbard as well as their intellectual followers more effectively than ever before. Its website, www.mises.org, makes a large number of books, journal articles, and other writings available for free. There exist a number of professional journals and periodicals published by the institute, including *The Journal of Libertarian Studies* (1977–2008) and *The Review of Austrian Economics* (1987–1998), for both of which Rothbard served as editor, as well as *The Quarterly Journal of Austrian Economics* (since 1998), which was started after Rothbard's death. Many of the contributors to the journal see themselves in line with Rothbardian economics. Rothbard himself, however, "by 1963 had grown discontented with economic analysis as an end in itself" (as cited in Casey 2010, p. 7) according to Gary North. Through his many radical writings in the area of libertarian ethics and philosophy as well as his political activism, for example, in support of the Libertarian Party (since 1971), Rothbard launched and spearheaded the modern libertarian and anarcho-capitalistic movement in the United States. Today, it has found followers all around the world.

References

Block W, Rockwell LH Jr (1988) Man, economy and liberty – essays in Honor of Murray N. Rothbard, Ludwig von Mises Institute. Available online: http://mises.org/document/3073/Man-Economy-and-Liberty-Essays-in-Honor-of-Murray-N-Rothbard

Caplan B (2008) What's wrong with Austrian business cycle theory. Library of Economics and Liberty, London and New York. Available online: http://econlog.econlib.org/archives/2008/01/whats_wrong_wit_6.html#

Casey G (2010) Murray Rothbard, volume 15 in the series major conservative and libertarian thinkers. The Continuum International Publishing Group, London and New York

Eltzbacher P (1908) Anarchism. Benj. R Tucker, New York. Available online: http://www.gutenberg.org/ebooks/36690, and in the original German version: https://archive.org/details/deranarchismus00eltzgoog

Flood A (2008) Murray Newton Rothbard: notes toward a biography, published on personal webpage of the author. Available online: http://www.anthonyflood.com/murrayrothbardbio.htm

Gordon D (2007) The Essential Rothbard. Ludwig von Mises Institute. Available online: http://mises.org/document/3093/The-Essential-Rothbard

Hoppe H-H (1999) Murray N. Rothbard: economics, science, and liberty. In: Holcombe RG (ed) 15 Great Austrian economists. Ludwig von Mises Institute. Available online: http://mises.org/document/3797/15-Great-Austrian-Economists

North G (2010) Murray Rothbard as academic role model, presentation delivered at the 2010 Mises University. Available online: http://www.youtube.com/watch?v=0tcafUj6WyA

Payne J (2005) Rothbard's time on the left. J Liber Stud 19:9. Available onloine: https://mises.org/journals/jls/19_1/19_1_2.pdf

Robbins L (1971) The great depression. Books for Libraries Press, Freeport New York. Available online: http://mises.org/document/691/The-Great-Depression

Rothbard MN (1962) The panic of 1819: reactions and policies. Columbia University Press. Available online: http://mises.org/document/695/The-Panic-of-1819-Reactions-and-Policies

Rothbard MN (1981) How Murray Rothbard became a libertarian, talk given at the libertarian party national convention in Denver, Colorado. Available online as video: https://www.youtube.com/watch?v=M3HatEn0BjI, and as transcript: http://bastiat.mises.org/2014/04/transcript-how-murray-rothbard-became-a-libertarian/

Rothbard MN (1994) The case against the FED, Ludwig von Mises Institute. Available online: http://mises.org/document/3430/The-Case-Against-the-Fed

Rothbard MN (1997) The logic of action, 2 vols. Edward Elgar, Cheltenham

Rothbard MN (2000) America's great depression, 5th edn. Ludwig von Mises Institute. Available online: http://mises.org/document/694/Americas-Great-Depression

Rothbard MN (2002) The ethics of liberty. New York University Press, New York

Rothbard MN (2006) Making economic sense. Ludwig von Mises Institute. Available online: http://mises.org/document/899/Making-Economic-Sense

Rothbard MN (2007) The later 1960s: the new left. In: Woods TE Jr (ed) The betrayal of the American right. Ludwig von Mises Institute, Auburn, AL. Available online: http://mises.org/document/3316/The-Betrayal-of-the-American-Right

Rothbard MN (2008) The mystery of banking. Ludwig von Mises Institute. Available online: http://mises.org/document/614/Mystery-of-Banking

Rothbard MN (2009) Man, economy, and state, with power and market. Ludwig von Mises Institute. Available online: http://mises.org/document/1082/Man-Economy-and-State-with-Power-and-Market

Rothbard MN (2010) What has government done to our money? Ludwig von Mises Institute. Available online: http://mises.org/document/617/What-Has-Government-Done-to-Our-Money

Stigler G, Friedman M (1946) Roofs or ceilings?: the current housing problem. Foundation for Economic Education, Irvington-on-Hudson

von Hayek FA (1967) Prices and production, 2nd edn. Augustus M. Kelly, New York. Available online: http://mises.org/document/681/Prices-and-Production

von Mises L (1912) Theorie des Geldes und der Umlaufsmittel. Verlag von Duncker und Humblot, München und Leipzig. Available online: http://mises.org/document/3298/Theorie-des-geldes-und-der-Umlau

fsmittel; for the English translation see: http://mises.org/document/194/The-Theory-of-Money-and-Credit

von Mises L (1962) A new treatise on economics. New Individ Rev 2(3):39–42

von Mises L (1998) Human action (The Scholar's Edition). Ludwig von Mises Institute. Available online: http://mises.org/document/3250/Human-Action; for the German predecessor Nationalökonomie see: http://mises.org/document/5371/Nationalokonomie-Theorie-des-Handelns-und-Wirtschaftens

Rueff, Jacques

Adrien Lutz
GATE L-SE, Université Jean Monnet,
Saint-Étienne, France

Abstract

Jacques Rueff was a French economist with long experience in combining practice and theory. Deeply interested in epistemology and interdisciplinarity, Rueff was a monetary specialist and one of the leading European economists after World War II.

Biography

After studying at the École Polytechnique, **Jacques Rueff** (1896–1978) became an inspector of finance (1923–1926), special advisor to the League of Nations (1927–1930), financial attaché at the French Embassy in England in charge of the Bank of France's sterling reserve (1930–1933), deputy-director of the Mouvement général des fonds (previously the French Trésor; 1934–1939), and deputy governor of the Bank of France (1939–1941). Rueff also participated in the Walter Lippmann colloquium in 1938 (Lane 1997).

Until 1952, Rueff was deeply involved in the postwar negotiations (he was, for instance, the president of the inter-allied reparations agency). A strong advocate of European integration, Rueff was a judge of the Court of Justice of the European Communities (1952–1962). He also became an important economic advisor to

R

President Charles de Gaulle from 1958, and it was thanks to his plan (with Pinay) that France succeeded in balancing the budget and ensuring the convertibility of the franc. A proponent of a return to the gold standard, Rueff argued against inflation which he always considered a "false right." He later became a member of the Economic and Social Council.

Innovative and Original Aspects

Deeply interested in epistemology and interdisciplinarity, Rueff adopted a conventionalist methodology (Frobert 2009, see also Claassen 1967), applying this to topics such as unemployment (1925b, 1926, 1931a, b) and money (1927, 1953, 1961, 1963, 1965, 1971, 1973), and being among the first to consider economics as a statistical science (1925a, [1929] 1961). Surprisingly, although his earliest work did not directly express an interest in law (1922), many legal theorists commented on his work long before he became famous for his concept of the "false right" (1945).

The English translation of Rueff's *From the Physical to the Moral Sciences* ([1922] 1929) was widely discussed in American journals of law and philosophy. According to Rueff, economics is a moral science, all physical and moral sciences use the same tools, and all have a rational branch and an experimental branch. Although their objects, of course, differ, the aim remains always to discover the underlying laws of observed phenomena. Ironically, in this book, he never addressed the questions of law.

Practice and learning in American law had come under strong criticism in the nineteenth century, with particular emphasis on the quasi-mechanical application of its various laws and codes. Lawyers concerned with these issues turned to Rueff's work on economics and morality for an account of how a social science could be considered a "real science" like physics, constrained by the adoption of a scientific method. Discussion arose concerning what might be the scientific basis of the concept of law, whether social norms and the evolution of society should be taken into account in attempting to define that concept, and if so what methodology ought to be adopted.

Thus, a preface to Rueff's work was written by H. Oliphant (1884–1939) and A. S. Hewitt (1902–1987), teachers of law at Columbia and Johns Hopkins University respectively, and fervent advocates of interdisciplinarity particularly with respect to law and economics. From this preface, it was clear that Oliphant and Hewitt accepted that law could be a science on the condition that it applied a rigorous method, allowing case studies. Specifically, Oliphant (1923, 1928) argued in favor of a rapprochement of law and economics, since both aimed to establish a method that combined logic and experience, just as outlined by Rueff. According to them, when a society evolves, this means in terms of logic that one of its first premises has changed. For instance, in several countries, the abolition of the death penalty had only recently become conceivable, and abolition had not been discussed at all in their earlier history. It was therefore necessary to modify the legal texts in such a way as to follow the social changes. These American lawyers lacked a theoretical corpus, however, and this was why Rueff was so widely discussed. His incursions concerning morality strongly interested them, particularly because, for Rueff, manners and laws are valid only for a time.

Impact and Legacy

Law and economics become combined in Rueff's famous concept of the "false right." Rueff's starting point is the concept of the "property rights," which is rooted in the 544th article of the French civil code: "ownership is the right to enjoy and dispose of things in the most absolute manner, provided they are not used in a way prohibited by statutes or regulations." Rueff's *Social Order* (1945) argues that economics is not the science of wealth as has generally been thought, but

rather the science of the links between desired things and men's desiring those things. Wealth does not lie in the things desired but in our ability to enjoy and dispose of things.

As recently remarked by Minart (2016), according to Rueff the lawyer gives shape to the right to property, the economist provides its content, and the police its protection. The right to property is analyzed as a recipe for value. In this respect, a real right is a right that enables a seller to "empty" the content of his right to property "onto" a specific commodity and, in return, to "fill" his right with money. The buyer and the seller agree on the price, and then the right becomes real. And, to the contrary, a false right occurs when the value of wealth contained in this right does not comply with the amount of money the seller wishes to receive – in the case, for instance, of prices being fixed by a public authority.

According to Rueff, prices determine the volume of the right. If the selling price is lower than the purchase price, the volume of the right decreases. There follows an imbalance between supply and demand, and thus the creation of false rights. Such an imbalance is the basis of inflation. The same is also true for unemployment insurance, since it interferes with the free functioning of the price mechanism.

Having successfully combined theory and practice throughout his life, Rueff has made significant contributions to the field of economic analysis through his monetary analysis and his innovative false rights theory. Jacques Rueff remains in many respects one of the major French economists of the twentieth century.

Cross-References

▶ Economic Analysis of Law
▶ Law and Economics
▶ Property Rights: Limits and Enhancements

References

Claassen EM (1967) Jacques Rueff comme philosophe des sciences. In: Claassen EM (ed) Les fondements philosophiques des systèmes économiques. Textes de Jacques Rueff et essais rédigés en son honneur. Payot, Paris, pp 37–62

Frobert L (2009) Conventionalism and liberalism in Jacques Rueff's early works (1922 to 1929). European Journal of History of Economic Thought 17(3):439–470

Lane G (1997) Jacques Rueff: un libéral perdu chez les planistes. Conférence à Euro 92. In: Madelin A (ed) Aux sources du modèle libéral français. Perrin, Paris, pp 1–23

Minart G (2016) Jacques Rueff. Un libéral français. Odile Jacob, Paris

Oliphant H (1923) The problem of logical methods from the lawyers's point of view. Proceedings of the Academy of Political Science in the City of New York 10(3):19–20

Oliphant H (1928) A return to stare decisis. American Bar Association Journal 14(2):71–158

Rueff J (1922/1929) From the physical to the social sciences. The Johns Hopkins Press, Baltimore

Rueff J (1925a) L'économie politique, science statistique. Rev Metaphys Morale October:475–487

Rueff J (1925b) Les variations du chômage en Angleterre. Revue Politique et Parlementaire December, 32: 425–437

Rueff J (1926) Chômage et salaire réel en Angleterre dans la période 1919–1925. Séance de la Société d'Économie Sociale du 14 décembre 1925. La Réforme Sociale February:49–73

Rueff J (1927) Théorie des phénomènes monétaires. Œuvres complètes, II, Théorie monétaire, 1. Plon, Paris

Rueff J (1929/1961) La statistique, instrument de la connaissance. Journal de la Société Statistique de Paris 102:220–224

Rueff J (1931a) L'Assurance chômage cause du chômage permanent. Revue d'Économie Politique 45:211–251

Rueff J (1931b) L'assurance chômage, cause du chômage permanent. In: Académie des sciences morales et politiques, 1931, Séances et travaux de l'Académie des sciences morales et politiques: Compte rendu, 2e semestre. Alcan, Paris, pp 300–331

Rueff J (1945) L'ordre social. Sirey, Paris

Rueff J (1953) La régulation monétaire et le problème institutionnel de la monnaie. Recueil Sirey, Paris

Rueff J (1961) Discours sur le crédit. Éditions du Collège libre des sciences sociales et économiques, Paris

Rueff J (1963) L'âge de l'inflation. Payot, Paris

Rueff J (1965) Le lancinant problème des balances de paiements. Payot, Paris

Rueff J (1971) Le péché monétaire de l'Occident. Plon, Paris

Rueff J (1973) La réforme du système monétaire international. Plon, Paris

R

Rule of Law

Rosolino A. Candela[1] and Ennio Piano[2]
[1]Political Theory Project, Department of Political Science, Brown University, Providence, RI, USA
[2]Department of Economics, George Mason University, Fairfax, VA, USA

Abstract

This entry explores the role of the rule of law in a market economy. The emergence of the rule of law is a *precondition* of not only political and economic liberty but also economic growth and overall human progress. The presence, or lack thereof, of the rule of law determines whether human interaction will be positive-sum or negative-sum in nature. We explore first the fundamental attributes to the rule of law in relation to property rights and entrepreneurship. Second, we discuss in detail three attributes to the rule of law that generate this productive entrepreneurial process: (1) generality, (2) predictability, and (3) equality.

Introduction

Simply put, the rule of law refers to the absence of political or legal privilege among market actors *and* the absence of arbitrary discretion among political actors. It is a political–legal principle, whereby the governing authority of a particular society is restricted to enforcing laws applied equally to all *and* not intended to benefit one particular party at the expense of another. Any violation of the rule of law implies that political–legal privileges cannot be granted without simultaneously granting discretionary power to those political actors who are in the position to grant such privileges. Therefore, the presence, or lack thereof, of the rule of law determines whether human interaction will be positive-sum or negative-sum in nature.

The Rule of Law, Property Rights, and Entrepreneurship

According F.A. Hayek, one of the leading economists and legal scholars of the twentieth century, "the gradual transformation of a rigidly organised hierarchic system into one where men could at least attempt to shape their own life, where man gained the opportunity of knowing and choosing between different forms of life, is closely associated with the growth of commerce" (1944 [1994]: 18). Such a gradual transformation can be framed in terms of an inherent link between the rule of law, property rights, and entrepreneurship. The presence, or lack thereof, of economic development cannot be explained by an abundance or shortage of entrepreneurship in a society (see Baumol 1990; Boettke and Piano 2016); individuals are always and everywhere on the lookout for previously unnoticed profit opportunities (Kirzner 1973). However, whether or not such a pursuit of profit opportunities manifests itself as productive activities, such as trade and innovation, or unproductive activities, such as rent-seeking and theft (Tullock 1967), depends upon the allocation of entrepreneurial talent in a society (Murphy et al. 1991). Such an allocation is dependent upon the establishment of well-defined and well-enforced private property rights that can be exchanged via money prices, allowing entrepreneurs to calculate the relative scarcity of resources through the guiding signals of profit and loss. Such guiding signals communicate to entrepreneurs whether or not resources have been allocated to their most valued consumer uses (Mises 1920 [1975]). Both the productive allocation of entrepreneurship and the productive allocation of resources via exchange and innovation that follows from entrepreneurship require that property rights restrict competition only to profit-seeking that creates social wealth, not rent-seeking that destroys social wealth (see Boettke and Candela 2014b). Such a restriction, however, implies the presence of the rule of law, without which entrepreneurship will be negative-sum rather than positive-sum. Following Hayek (1960: 205–210), there are three attributes to the rule of law that generate this productive entrepreneurial process: (1) generality,

(2) predictability, and (3) equality. We discuss each of these attributes below in relation to property rights and entrepreneurship.

Generality

To understand the way in which laws are general and abstract, rather specific and concrete, it is important first to make a distinction, following James Buchanan, between the rules of the game and interaction within the rules of the game. The distinction we make between the rules of the game and social interaction within rules follows a "law and economics" approach (Marciano 2016; see also Wagner 2016). Law and economics analyzes, in a world of positive transactions costs, the degree to which different legal rules, particularly the absence or existence of the rule of law, affect economic performance, namely by ameliorating or exacerbating the costs of defining property rights and facilitating exchange. This approach is related, though distinct, to "the economic analysis of law." Although the terms are sometimes used interchangeably, the economic analysis of law approaches legal analysis by assessing the efficiency of legal rules in a world of zero-transactions costs.

The attribute of generality implies that the rule of law operates as a "meta-legal doctrine" (Hayek 1960: 206), through which the types of laws that are filtered through the legislative process are those that are *end-independent* and *impersonal*. Laws that are consistent with the rule of law must neither command any specific purpose upon individuals nor does it assign any concrete status or outcome that differentiates individuals before the law. This does not mean that laws that recognize individuals on the basis of sex, race, or creed violate the rule of law; rather, it is only when such groups are preassigned a special status or privilege at the expense of other individuals that the rule of law is violated. This violation occurs in a twofold manner. First, resources and income are transferred by force to the politically privileged to the expense of the politically disenfranchised. For example, import tariffs on particular goods lead to the loss of consumer surplus and generate rents for domestic producers of that good. Secondly, and more importantly, the political transfer from one party to another cannot occur without simultaneously granting discretion to the political official, who must exercise arbitrary force in making such a transfer. When the rule of law is violated, the legislator is no longer "blind," but can in fact foresee how and to whom laws will effect particular groups of individuals in society. As a result, entrepreneurship in such a society will mutate from profit-seeking to rent-seeking, as entrepreneurs will expend resources to capture privileges through political exchange, which wastes resources that could have otherwise been used for productive innovation (Harnay and Marciano 2011).

Predictability

The rule of law does not assign marching orders to individuals but acts like traffic signals that guide the interaction of individuals in a noncoercive manner. Like traffic signals, they do not rely on legislators directing any other individual in advance, by force, or how to act explicitly. Rather, because individuals can reliably expect that laws will not be changed arbitrarily, "planning" is left to the individual at a particular place and time. Predictability, however, implies neither the complete lack of change in the law nor the absence of a judiciary. Rather, it only implies that laws will be changed on the margin by judges to facilitate coordination between contesting parties according to the circumstances of place and time. Such evolution in the law will be marginal, but adaptive for the adjudication of new disputes, yet consistent with the body of judicial precedent. Therefore, if rule of law is in place, entrepreneurs can reliably feel secure in their property and be able to deploy their resources in long-term investment projects that are productive and wealth-creating. Predictability means laws are intended for such a duration that no one, not even the legislator, can anticipate who will benefit from such laws. It is in this sense that the rule of law operates as a "fifth factor of production" (Boettke and Candela 2014a), providing the framework for

R

the coordination of the land, labor, and capital by entrepreneurs according to their foresight about future profit opportunities. This has important implications for entrepreneurship and economic development. First, entrepreneurs in the marketplace can reliably "predict," or anticipate, that they will only be harmed by the threat of losses from competing entrepreneurs, without fear of being harmed by the threat of public predation in the form of outright theft or regulation that bars them from entry into the marketplace. The unintended consequence of the rule of law, then, is to discipline entrepreneurs to accrue profits only by innovating, lowering costs, and producing resources according to consumer preferences. When the rule of law is violated, the only "predictability" that entrepreneurs have in their ability to accrue profits is to bar their competition from entry into the marketplace via capture of monopoly privileges.

Equality

The link between the predictability of laws and the spontaneity of the market process is the attribute of equality before the law. Under the rule of law, laws are applied equally to all, both to the ruler and the ruled. Social interaction and the outcomes of such interactions are guided horizontally by voluntary contract between individuals within the game, not vertically by capturing legal status or manipulating political officials to "bend the rules" in an individual's favor. Thus, under the rule of law, one's relative wealth or status in society is not predetermined by privilege; rather, it is *discovered* by learning how best to serve their fellow man via contractual exchange and innovation. In this capacity, government only acts as a referee, or umpire, to enforce the law, setting the precondition within which not one but multiple purposes and plans can be pursued by individuals via trade and exchange. Equality before the law is crucial to entrepreneurship and economic development because it recognizes that individuals are different and unique in their talents, potentialities, and knowledge of a particular time and place. It is freedom from legal discrimination that allows the

spontaneous interaction of diverse individuals to generate entrepreneurial discoveries that are accidental and previously unforeseen. How could Malcolm McLean have applied his unique knowledge of trucking and shipping to pioneer the container ship in the 1950s if he was legally barred by shipping regulations? (see Levinson 2006) The rule of law cannot be violated without the tendency of substituting the rule of men. Under the rule of law, profits and losses in the marketplace are determined by the ability of entrepreneurs to serve consumers. Under the rule of men, profit and losses are determined by the ability of entrepreneurs to win political privileges, which come at the expense of the consumer.

Cross-References

▶ Austrian Perspectives in Law and Economics
▶ Austrian School of Economics
▶ Common Law System
▶ Customary Law
▶ Efficiency
▶ Hayek, Friedrich August von
▶ Liberty
▶ Mises, Ludwig von
▶ Rule of Law and Economic Performance

References

Baumol WJ (1990) Entrepreneurship: productive, unproductive, and destructive. J Polit Econ 98(5): 893–921

Boettke PJ, Candela R (2014a) Hayek, Leoni, and law as the fifth factor of production. Atl Econ J 42(2):123–131

Boettke PJ, Candela RA (2014b) Development and property rights. In: Marciano A, Ramello GB (eds) Encyclopedia of law and economics. Springer, New York

Boettke PJ, Piano E (2016) Baumol's productive and unproductive entrepreneurship after 25 years. J Entrep Public Policy 5(2):130–144

Harnay S, Marciano A (2011) Seeking rents through class actions and legislative lobbying: a comparison. Eur J Law Econ 32(2):293–304

Hayek FA (1944 [1994]) The road to Serfdom, 50th anniversary edition. University of Chicago Press, Chicago

Hayek FA (1960) The constitution of liberty. University of Chicago Press, Chicago

Kirzner IM (1973) Competition & entrepreneurship. University of Chicago Press, Chicago

Levinson M (2006) The box: how the shipping container made the world smaller and the world economy bigger. Princeton University Press, Princeton

Marciano A (2016) Economic analysis of law. In: Marciano A, Ramello GB (eds) Encyclopedia of law and economics. Springer, New York

Mises L (1920 [1975]) Economic calculation in the socialist commonwealth. In: Hayek FA (ed) Collectivist economic planning. August M. Kelley, Clifton

Murphy KM, Shleifer A, Vishny RW (1991) The allocation of talent: implications for growth. Q J Econ 106(2):503–530

Tullock G (1967) The welfare costs of tariffs, monopolies, and theft. West Econ J 5(3):224–232

Wagner RE (2016) Gordon Tullock: a Maverick scholar of law and economics. In: Marciano A, Ramello GB (eds) Encyclopedia of law and economics. Springer, New York

Rule of Law and Economic Performance

Rosolino A. Candela[1] and Ennio Piano[2]
[1]Political Theory Project, Department of Political Science, Brown University, Providence, RI, USA
[2]Department of Economics, George Mason University, Fairfax, VA, USA

Abstract

This entry explores the connection between the rule of law and economic performance. First, we analyze the role of interjurisdictional competition, and how the rule of law emerged as a by-product of this competitive process, initially in Western Europe. Second, we discuss the role of intrajurisdictional competition between interest groups, which reinforced the emergence of the rule of law within states. Finally, we discuss the mechanism by which the rule of law successfully or unsuccessfully became established in Western offshoots, particularly in Africa and the Americas, affecting the long-term economic performance of these areas.

JEL Codes
O12; P14; P16

[W]e may say that the movement of the progressive societies has hitherto been a movement *from Status to Contract* – Henry Sumner Maine (emphasis original, 1861 [1982]: 170)

Introduction

The most incredible fact in recent economic history is the rapid decline of extreme poverty throughout the developing world. According to the World Bank, the percentage of individuals living on less than two dollars per day has fallen from 37% in 1990 to less than 10% of the world's population by the end of 2015. This dramatic fall in poverty has been due to a turn towards the protection of private property, freedom of contract, and most importantly, the establishment of the rule of law during this same period, particularly in areas that abandoned central economic planning, such as China, India, and Central and Eastern Europe. This more recent phenomenon of modern economic growth is a part of a progressive transition in societies that began first in Western Europe, from one in which wealth is accumulated through political transfers of privilege to a politically connected few, to one in which wealth is created through voluntary market exchange and innovation among many anonymous strangers. This social and economic transition is fundamentally based on an *institutional transition* towards the emergence and establishment of the rule of law, or as Maine put it, "*from Status to Contract*."

However, the importance of the rule of law is not simply due to economic development in terms of increasing growth rates (Ručinská et al. 2016). Wealth creation produced by productive entrepreneurship within the rule of law is necessary, but not sufficient for explaining human progress. Boettke and Subrick (2003) find that the rule of law also positively affects human capabilities, which refers to ability of individuals to lead the sort of lives that they value. That is, a variety of *noneconomic* fundamental aspects of the human existence, including life expectancy, child mortality, literacy rates, and immunization, are positively related with the protection the rule of law. Therefore, the rule of law is good for

R

development, and development is not just good for one's stomach but also one's mind and soul.

This entry explores the connection between the rule of law and economic performance. First, we analyze the role of interjurisdictional competition, and how the rule of law emerged as a by-product of this competitive process, initially in Western Europe. Second, we discuss the role of intrajurisdictional competition between interest groups, which reinforced the emergence of the rule of law within states. Finally, we discuss the mechanism by which the rule of law successfully or unsuccessfully became established in Western offshoots, particularly in Africa and the Americas, affecting the long-term economic performance of these areas.

The Emergence of the Rule of Law Via Interjurisdictional Competition

The degree to which the rule of law will lead to economic development depends upon whether or not the discretionary hands of a ruler are tied from altering property rights arbitrarily. Otherwise, entrepreneurship will be directed into unproductive activities. According to North and Weingast (1989: 804), "A ruler can establish such commitment in two ways. One is by setting a precedent of 'responsible behavior,' appearing to be committed to a set of rules that he or she will consistently enforce. The second is by being constrained to obey a set of rules that do not permit leeway for violating commitments." Beginning in a world in which governments have not established a credible commitment to predate its subjects, the question, then, is how did the rule of the law first emerge in the West?

Weingast (1997: 245) attempts to explain "the remarkable variation among states in the rule of law." In his framework, the rule of law is understood as "a set of stable political rules and rights applied to all citizens," one among many possible equilibria in a political-economic game between the government and the different subsets of the citizenry. Governments are often tempted to act arbitrarily to their own advantage. The citizens as a collective have an interest in constraining the

arbitrary actions of the government. But any subset of the population will sometimes gain something from these violations of the rule of law.

The logic of the classic prisoners' dilemma game applies. As evidence of this, historically, most societies have been trapped in a subpar equilibrium. Members of society disregard (and sometimes encourage) the violation of the rule of law whenever it benefits them. Escaping the subpar equilibrium requires coordination among citizens. Oftentimes, this can be so costly to being unfeasible. To make the rule of law a self-enforcing constraint on governmental interference with society, the interests and beliefs of large sections of the citizenry must be aligned, at least to some degree. Thus, societies with high degrees of fractionalization (ethnic, cultural, political) are less likely to coordinate than more homogeneous ones (Weingast 1997).

These obstacles notwithstanding, coordination is possible. The rule of law, as it emerged first in Western Europe, was an emergent phenomenon of human action, though not of human design. Given the politically fragmented nature of Western Europe, violent international competition between states required European political leaders to finance the maintenance of strong military forces against the threat of conflict. In order to finance military expenditures, such political leaders were incentivized to expand their tax revenue base in a wealth-maximizing manner, the unintended result of which was for the political elite of each state to attract merchants, bankers, and technological innovators by securing property rights in their resources. The effect of this institutional change was to encourage the development of capital markets capable of mobilizing large concentrations of wealth from which to tax and borrow. Moreover, in order for the political elite to have tapped this economic potential, this required not only security from arbitrary expropriation and confiscation but also toleration of technological experimentation and new ideas that would yield savings and investment. These institutional changes facilitated the expansion of technological innovation and productive specialization under the division of labor. As an unintended consequence of such action, feudalistic privileges

were gradually eroded and economic and political liberty was reinforced until a critical threshold was met, leading to an explosion of economic growth in the early nineteenth century (Rosenberg and Birdzell 1986; Cowen 1990).

The Emergence of the Rule of Law Via Intrajurisdictional Competition

The rule of law first emerged not only via interjurisdictional competition between competing states but also through intrajurisdictional competition between competing interest groups. North et al. (2009) provide a generalized version of this framework, with a stronger focus on the role of the elites. The fundamental puzzle driving their investigation is why the elites would ever extend their rights and liberties to the public at large. Historically, the natural state of human societies has been one dominated by relatively small groups or coalitions of a few large interest groups. These interest groups have the ability of using violence to appropriate wealth from the rest of the population. But as conflict is potentially very costly even for the stronger parties, the interest groups (and the subjects as well) face a strong incentive to institutionalize wealth extraction to minimize the expected costs from conflict. The resulting coalition of interests must therefore generate enough rents for each of its members to prevent defection. Legal monopolies and other special privileges are the way in which these rents are generated (Olson 1982). The public at large suffers from the resulting welfare losses, but it is actually better off than the more likely alternative of a civil war.

To operate effectively, the rent-seeking coalition needs a set of rules to govern the interactions among its members. The resulting norms are the seeds of the modern rule of law. Thus, the government will enforce property rights and contracts by providing institutions for the resolution of disputes between coalition members. Once these institutions have been established, society is on the brink of what the authors call "open access order," or a rule of law regime. In a pacified society, where all gains from trade within the coalition have been exhausted, there is a potential

benefit from extending these institutions to a broader subset of the population. The coalition can credibly commit not to reverse the process by decentralizing political power (Weingast 1995) or extending political enfranchisement (Acemoglu and Johnson 2005).

The classic example is post-Glorious Revolution England (North and Weingast 1989; Acemoglu and Robinson 2012). The seeds for the self-enforcement of the English constitution after the Glorious Revolution can be traced back to the reissue of the Magna Carta in 1225. Leeson and Suarez (2016: 43) emphasize how the eventual self-enforcement of the Magna Carta required three conditions: (1) common knowledge among groups of citizens about when the ruler has violated the constitution; (2) rendering it in the interest of each group of citizens to rebel in order to enforce constitutional constraints on the ruler; and (3) creating a shared expectation among those groups that the others will rebel if the ruler violates the constitution, which in turn makes it rational for each such group to itself rebel in this event. These conditions also apply to explain the success of the Glorious Revolution in England.

Following the short interlude of Cromwell's republican regime, the English parliament had restored the Stuart dynasty to lead the country. Within the next few years, the Crown took a series of actions to undermine the interests of the reformist and constitutionalist Whig party. Finding these actions to their own advantage, the Tories (the members of the conservative and monarchist party) aligned themselves with the Crown. This lasted until the 1680s, when the Stuarts started to take similar actions against the Tories. In 1688, the two parties coordinated their efforts, dethroned James II, and establish the Prince of Orange as the new monarch under a new constitution agreed upon by both parties. The Glorious Revolution resulted in the establishment of the rule of law and had other positive economic results. By establishing a permanent role for Parliament in the management of the government, it directly checked the discretion of the Crown to call and disband Parliament unilaterally. Moreover, parliamentary veto over expenditures, the right to monitor the expenditure of funds, and

R

the established supremacy of common law courts assured the protection of private property rights from expropriation and discretion.

The Colonial Origins of the Rule of Law

In the previous sections, we discussed the endogenous formation of the rule of law through competition between states and competition between interest groups within states. However, the literature on the colonial origins of economic performance illustrate where and how the rule of law can be exogenously established. The empirical research on the relationship between rule of law and economic performance falls under the umbrella of development economics. Building on the theoretical insights of Smith (1776), Hayek (1960), North (1990), and others, by the early 2000s economists started paying attention to the role of institutions as determinants of economic development. This institutional paradigm emerged in response to the (at the time) influential view that geography was a major factor in determining a country long-run economic prospects (Diamond 1997; Sachs and Warner 1997; Gallup et al. 1999). The first major contribution to this literature is a famous paper by Acemoglu, Johnson, and Robinson on the "colonial origins" of economic development (Acemoglu et al. 2001). Here, the authors attempt to disentangle and identify the causal effect of geographical and institutional factors on long-run economic growth. To do so, they take advantage of a natural experiment of history: the European colonization of Africa and the Americas.

According to their story, the mortality rate of early settlers influenced the adoption of institutions by the colonial governments. Where settlers' mortality was low, colonial governments encouraged the immigration of individuals from the homeland. To move to the colonies, European settlers demanded the adoption of a set of institutional measures associated with the rule of law (the protection of basic human rights and private property and some form of political representation). In other regions, higher settlers' mortality prevented similar migratory patterns. Dealing

with a mostly indigenous population, colonial governments adopted political and economic institutions aimed at the extraction of resources (including indigenous labor's services).

Relying on the sluggish nature of institutional change, and using settler's mortality as an exogenous determinant of institutional diversity, the authors find the quality of institutions adopted by colonial governments is a strong predictor of today's economic performance. Furthermore, the authors find that, controlling for institutional quality, geographical factors usually assumed to play a causal role in the dynamics of development such as distance from the equator, have no *independent* effect on long-run economic growth. According to Acemoglu et al. (2001), geography affects economic performance only through their effect on institutions.

In a follow-up to their original article, the same authors adopt a different empirical strategy to reach similar conclusions (Acemoglu et al. 2002). Here, urbanization and population density at the arrival of the Europeans take the place of settlers' mortality rate as instruments for institutional quality. A higher population density at time of discovery provided colonial governments with a pool of disposable and cheap labor to be exploited, while less inhabited areas required the influx of large numbers of workers from the homeland. In the former case, the colonists adopted the indigenous extractive institutions where they were already in place and made-up their own otherwise. In the latter case, they imported private property and constitutional government. This exogenously determined institutional diversity, the authors find, accounts for the puzzling case of the "reversal of fortune" of the last five hundred years: those extra-European regions that were the richest (poorest) before colonization are today among the richest (poorest) in the world. Glaeser et al. (2004) and La Porta et al. (2008) provide an alternative (but similarly influential) empirical approach to the same question. In their strategy, the initial institutional variation across countries is due not to the decision of formal political institutions, but the prevalent legal regime in the colonists' home country. They separate between (English) common law

on the one hand and a variety of "families" of civil law (French, German, Scandinavian, and Socialist). The authors find that, in general, common law countries outperform civil law ones on most measures of institutional quality that are strongly positively correlated with economic performance, including constraints over governmental arbitrary powers, quality of public officials, property right protection, and so forth. All these findings are consistent with the traditional understanding of the beneficial nature of the rule of law: the closest a country's institutions to the ideal of the rule of law, the more effective these institutions and the more dynamic and productive the economy.

Conclusion

Private property rights and entrepreneurship are necessary, though not sufficient for economic development. Given the scarcity of resources, property rights and entrepreneurship are ubiquitous, but their manifestation is ultimately contingent on the presence of the rule of law. Property rights over resources can be acquired through productive entrepreneurship via market exchange (i.e. profit-seeking) or through unproductive entrepreneurship via political exchange (i.e. rent-seeking). Fundamentally, the rule of law is *the* institutional filter that restricts the exchange of private property and productive entrepreneurship to the coordinating invisible hand of the market process, rather than being guided by the discretionary visible hand of the political process (Boettke and Candela 2014).

Recognizing the link between the rule of law and economic performance has important implications not only for economic theory but also for economic policy as well. As evidenced by the American financial crisis of 2008, the European sovereign debt crisis, and the recent Brexit vote of June 2016, discretionary monetary policy, fiscal policy, public administration, and labor market policy has lead increasingly to a movement away from societies based on contractual exchange to societies based on the status of expert rule, which privileges nondemocratic, expert administration of independent regulatory agencies that violate the rule of law. If this trend continues, the overall effect will not only lower standards of living but also erode civil liberties and increase the fractionalization of societies, as a result of legislation privileging certain groups of people at the expense of another. As we have tried to argue in this entry, political officials cannot violate the rule of law for the purpose of expediency without simultaneously stifling the principles upon which the spontaneous creative powers of a free civilization are based.

Cross-References

▶ Austrian Perspectives in Law and Economics
▶ Austrian School of Economics
▶ Common Law System
▶ Customary Law
▶ Efficiency
▶ Hayek, Friedrich August von
▶ Liberty
▶ Mises, Ludwig von
▶ Rule of Law

References

Acemoglu D, Johnson S (2005) Unbundling institutions. J Polit Econ 113(5):949–995

Acemoglu D, Robinson JA (2012) Why nations fail: the origins of power, prosperity, and poverty. Crown Publishing, New York

Acemoglu D, Johnson S, Robinson JA (2001) The colonial origins of comparative development: an empirical investigation. Am Econ Rev 91(5):1369–1401

Acemoglu D, Johnson S, Robinson JA (2002) Reversal of fortune: geography and institutions in the making of the modern world income distribution. Q J Econ 117(4):1231–1294

Boettke PJ, Candela RA (2014) Development and property rights. In: Marciano A, Ramello GB (eds) Encyclopedia of law and economics. Springer, New York

Boettke PJ, Subrick JR (2003) Rule of law, development, and human capabilities. Supreme Court Econ Rev 10:109–126

Cowen T (1990) The economic effects of a conflict-prone world order. Public Choice 64(2):121–134

Diamond J (1997) Guns, germs, and steel: the fates of human societies. W.W. Norton, New York

Gallup JL, Sachs JD, Mellinger AD (1999) Geography and economic development. Int Reg Sci Rev 22(2): 179–232

R

Glaeser EL, La Porta R, Lopez-de-Silanes F, Shleifer A (2004) Do institutions cause growth? J Econ Growth 9(3):271–303

Hayek FA (1960) The constitution of liberty. University of Chicago Press, Chicago

La Porta R, Lopez-de-Silanes F, Shleifer A (2008) The economic consequences of legal origins. J Econ Lit 46(2):285–332

Leeson PT, Suarez PA (2016) An economic analysis of Magna Carta. Int Rev Law Econ 47:40–46

Maine HS (1861 [1982]) Ancient law. Gryphon Editions, Birmingham

North DC (1990) Institutions, institutional change and economic performance. Cambridge University Press, New York

North DC, Weingast BR (1989) Constitutions and commitment: the evolution of institutional governing public choice in seventeenth-century England. J Econ Hist 49(4):803–832

North DC, Wallis JJ, Weingast BR (2009) Violence and social orders: a conceptual framework for interpreting recorded human history. Cambridge University Press, New York

Olson M (1982) The rise and decline of nations: economic growth, stagflation, and social rigidities. Yale University Press, New Haven

Rosenberg N, Birdzell LE Jr (1986) How the west grew rich: the economic transformation of the industrial world. Basic Books, New York

Ručinská S, Müller R, Nauerth JA (2016) Economic development. In: Marciano A, Ramello GB (eds) Encyclopedia of law and economics. Springer, New York

Sachs JD, Warner AM (1997) Sources of slow growth in African economies. J Afr Econ 6(3):335–376

Smith A (1776 [1981]) An inquiry into the nature and causes of the wealth of nations. Liberty Fund Press, Indianapolis

Weingast BR (1995) The economic role of political institutions: market-preserving federalism and economic development. J Law Econ Organ 11(1):1–31

Weingast BR (1997) The political foundations of democracy and the rule of law. Am Polit Sci Rev 91(2):245–263