Benito Arruñada*

Specialization and Rent-Seeking in Moral Enforcement: The Case of Confession **

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Abstract

Moral codes are produced and enforced by more or less specialized means and are subject to standard economic forces. This paper argues that the intermediary role played by the Catholic Church between God and Christians, a key difference from Protestantism, faces the standard trade-off of specialization benefits and agency costs. It applies this trade-off hypothesis to confession of sins to priests, an institution that epitomizes such intermediation, showing that this hypothesis fits cognitive, historical and econometric evidence better than a simpler rent-seeking story. In particular, Catholics who confess more often are observed to comply more with the moral code; however, no relationship is observed between mass attendance and moral compliance. The data also links the current decline in confession to the rise in education, which makes moral self-enforcement less costly, and to the productivity gap suffered by confession services, given its necessarily interpersonal nature.

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* Department of Economics and Business. Universitat Pompeu Fabra. Trias Fargas, 25. 08005-Barcelona (Spain). E-mail: benito.arrunada@upf.edu.

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1. Motivation

Oral confession of sins to priests is an interesting institution for three reasons. First, it is a highly complex, organized and sophisticated (though not necessarily superior) form of producing moral enforcement. Moral codes often emerge from spontaneous processes which use non-specialized resources, while Christian confession is highly managed and relies on specialized resources. It therefore epitomizes religious intermediation in which priests or, more generally, a church organization acts as an agent between God and the faithful. Second, this moral intermediation was a central issue in the development of Western civilization, as shown most explicitly when the Protestant Reformation drastically reduced the intermediary role played by the Church. Third, understanding how confession works will help us understand how we now produce and enforce moral codes through more spontaneous, less specialized means, and the problems these may entail.

Most authors see confession as oppressive or ineffective. Among them, Adam Smith, for whom confession gave the clergy too many opportunities for improving their revenues,[1] and Max Weber (1920a), for whom easy forgiveness through confession motivates individuals' productivity less than Protestant salvation by grace alone. The Weber thesis has prompted many works at the macroeconomic level, trying to explain growth differentials as a consequence of the dominance of different religions. Previous analyses have also emphasized the negative elements of confession. For instance, the theology of purgatory, seen by Ekelund, Hébert and Tollison (1992) as an invention designed to facilitate price discrimination. Likewise, the establishment of Mendicant Orders is conceived by Schmidtchen and Mayer (1997) as a device to extract parishes' rents. Because these works assume perfect rationality, they see penance as the price paid for eternal salvation, this being a mere consumption good of constant quality, whatever its production process. This perspective is useful, as discussed in section 4.3, but does not explain the function and persistence of confession. In particular, the argument by Ekelund, Hébert and

[1] Smith's critique occupies most of the last chapter of *The Theory of Moral Sentiments* (1759), focusing it on the agency costs of confession in *The Wealth of Nations* (1776: 789-90).

Tollison (hereafter EHT), who see Catholic confession purely as a rent extraction device, is incomplete. Rent seeking, and agency costs more generally, are inherent in all kinds of trade and specialization between self-interested individuals transacting in a world of imperfect information (Barzel, 1997: 14). Therefore, the presence of even systematic rent seeking does not fully explain the role of such a complex institution.

Some other thinkers considered confession of sins useful for psychological and social welfare. The development of its supporting theology during the late Middle Ages, grounded on free will and salvation by works, is even seen as a stepping stone of Western civilization (White, 1978; Delumeau, 1992; Hopkins, 1999). The doctrine of penance, in particular, is often viewed as a main source of Western criminal law (Berman, 1983).

This article draws a more balanced picture. Section 2 presents the analytical framework, which sees confession as a form of specialization burdened with agency costs. It focuses on the superior incentives that this specialization makes possible, the presence of agency costs and the dependence of its achievements on two variables: the education of the laity and economic development. The remaining sections test this argument relying on behavioral, historical and quantitative evidence. Section 3 explains the cognitive roots of the costs-and-benefits trade-off. Section 4 interprets the historical evolution of Christian confession of sins in terms of exogenous changes and innovations affecting the balance of costs and benefits. Section 5 does the same with the modern situation. Section 6 provides supportive econometric evidence. Section 7 concludes.

2. Analytical framework: specialization advantages versus agency costs

In most social exchange, different agents may act as enforcers: impartial *third parties* such as judges; *second parties* when they are in a position to retaliate; and *first parties*, who evaluate their own conduct relative to their moral codes and then reward or punish themselves psychologically.

We often envision first-party enforcement as a purely individual matter but we also often consult others about the moral worth of our actions. When doing this, we are allowing a third

party to help in our first-party enforcement. Catholic confession also introduces a third party, the confessor priest, into first-party enforcement. Confessors hear repentant believers orally confessing their sins (their breaches of the moral code) and then counsel, examine, judge, set penance and eventually forgive them. Compared to other types of moral enforcement, confession therefore uses more specialized resources—priests—to provide quality confession services and theologists to refine the moral code. In contrast, other types of religious enforcement are less specialized, relying instead on believers self-examining themselves without external help, or mutually controlling each other through informal monitoring or public confessions.

2.1. Static hypothesis: the trade-off in confession

As with any other type of economic specialization, specialized confession can be expected to produce better outcomes—mainly more effective self- and social control—at lower costs. Greater specialization, however, should also cause additional agency costs, as priests can exploit confessions for the Church's and their own benefit.

The sustained hypothesis in this paper is that confession presents this trade-off of costs and benefits and is not, as often claimed, a mere rent-seeking device. In particular, considering specialization advantages, confession should be (a) more effective than other religious practices, such as prayer or mass attendance, in enforcing the moral code (*enforcement proposition*). However, confession should also (b) provide greater scope for priests to condition penitents' behavior to the benefit of themselves or the Church (*rent-extraction proposition*).

The greater explanatory power of this costs-and-benefits hypothesis will be verified by showing that it fits in better with human nature, history and quantitative data than the rent-seeking hypothesis. Cognitive sciences show that it suits the design of the human mind. The history of confession amounts to a parallel increase of specialization and safeguards against opportunism. Lastly, Catholics who confess more often also help the poor more and give more money to the church, after controlling for demographic variables and discarding possible hidden effects. Furthermore, confession is also more effective in inducing moral compliance than attending mass, as those attending masses more often do not significantly help the poor more.

2.2. Dynamic hypotheses: factors affecting the trade-off

The specialization advantages of confession depend on exogenous factors which make it more or less efficient than alternative enforcement systems. I will explore two propositions. First, education makes self- and social enforcement easier and should, therefore, reduce the comparative advantage of confession (*education proposition*). Second, the personal nature of confession blocks technical change and its productivity lags behind the rest of the economy. Given resource mobility, the cost of confession will therefore grow over time, as suggested in general for all personal services by Baumol (1967) (*cost-disease proposition*).

Results are consistent with the view that the secular decline in confession parallels environmental changes that reduced the cost of moral self-enforcement and increased the cost of confession. First, the decline took place earlier in Protestant countries, which were better educated than Catholic ones. Second, the observation that educated Catholics confess less often supports the claim that education makes moral self-enforcement relatively more effective. Lastly, the number of Catholic priests follows the same pattern as personal professional services: its rate of growth decreases with economic development. This is consistent with the view that the cost of confession has risen, probably because confession does not admit technical change.

3. Cognitive evidence

From a conventional perspective based on rational choice and utility maximization, religion and even the existence of morality are hard to explain. Findings in cognitive sciences, however, suggest that having a moral sense and, in particular, religious beliefs and practice can improve fitness. Functional explanations of religion emerge naturally from this view, complementing the rationality assumption and clarifying the potentially adaptive role of beliefs, irrespective of whether they are true or false. We are evolved for fitness, not for truth, and beliefs can be adaptive yet contrary to truth.

Just like any other product of evolution, the human mind is adaptive to a certain environment. However, many of its structures have become non-adaptive since human beings modify their

environments faster than the pace of adaptation attainable by natural selection.[2] For instance, our food preferences are better adapted to the scarcity and life style of hunter-gatherers living in the Pleistocene than to modern humans. We therefore need non-genetic control devices for all sorts of instincts, both in the individual and social spheres. From this perspective, religions are cultural adaptations that help modern humans to exert self- and social control over ancient instincts. A classic example comes from Adam Smith's remark that "[i]n the Decalogue we are commanded to honour our fathers and mothers. No mention is made of the love of our children" (Smith, 1759: 266): we need a cultural complement to induce help to our parents but not to our children. The same can be argued about the need to postpone gratification (our subjective discount rate being too high for today's world), to avoid revenge (as we now live in a legal environment) or to reduce xenophobia (in order to facilitate trade with strangers), to mention just three examples. Even Communists have come to appreciate the pro-social role of religion.[3]

Catholic confession, and Catholic theology more generally, fits well in this analysis by providing an institutionalized structure that strives to improve on purely emotional morality. Not only Adam Smith (1759), with his emphasis on sympathy and compassion, but also modern cognitive accounts, such as those by Boyer (1994, 2001) and Haidt (2003), are grounded on emotions and instincts. Catholicism built a rationalistic moral code and encouraged individuals to account for their actions rationally, balancing good and bad, instead of merely responding to moral emotions which might be maladapted to the environments built by humans since the Pleistocene. Confession was the main instrument used by the Church for consistently applying this ideal of rational control of emotions. Such an ideal of emotional control is as necessary now as in the past, to judge from the constant flow of new solutions, including the "self-help" industry and its "emotional intelligence" branch (Goleman, 1995).

Cognitive sciences also provide a basis for the cost side of this paper's argument, because some scholars interpret religion in terms of exploitative use of mental tools previously designed by natural selection to solve other problems and therefore consider it to be a cultural parasite or

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[2] See Tooby and Cosmides (1992), Cosmides and Tooby (1992).

[3] "Religion in China: When Opium Can Be Benign," *The Economist*, February 1, 2007.

by-product. One such is Boyer (2001) who emphasizes parasitism and asserts that humans have a "moral sense" that does not need religion to function. They suggest that this weakness in the deep design of the human mind could be used by "experts" (that is, priests in Catholicism) to exert control over others for their own benefit. Similarly, Dawkins has argued vigorously about the costs of religious beliefs (2001).

The potential for agency costs is also clear in confession, as confessors gain information advantages and opportunities to influence others. But confession may also lead to clear benefits related to self- and social control. It improves individual rationality and fitness, by helping to control ill-adapted mental modules in a rapidly-changing environment. In addition, it provides incentives and articulates enforcement mechanisms that inhibit free-riding, an essential ingredient for intra-group cooperation, by detecting and punishing cheaters and by promoting conformity.

Confession also fits this cognitive argument because the functioning of confession relies on basic instincts, with emotions such as shame and guilt playing fundamental roles, as in other moral constructs (Haidt, 2003). However, it is not raw but channeled emotions that play a role in confession, thus providing the potential for greater adaptation. Shame *management* was an important aspect of the education of confessors, who had to draw a fine line by using shame to motivate sinners without alienating them. Similarly, guilt is also managed to avoid both the lax rationalization of wrongs and excessive scrupulousness (Tentler, 1977). Many other emotions moonlight as code enforcers. For instance, disgust at the sight of blood and body fluids plays a prominent role in many sex-related taboos and this was used until recently for controlling sexual behavior.

Finally, a substantial body of empirical evidence shows that repentance and forgiveness produce cooperative and psychological benefits in both humans and animals. Some forgiveness has been shown to achieve better results than tit-for-tat strategies in the iterated prisoner's dilemma, especially when cooperation and defection are hard to distinguish, as first argued by Axelrod (1984). Forgiveness also enhances psychological well-being (Krause and Ellison, 2003) and has positive consequences in terms of health (McCullough, Pargament and Thoresen, 2000) and pro-social behavior (Wuthnow, 2000). Confession should have similar cathartic effects. It is

well established that reconciliation also happens among primates, supporting the view that it helps social animals to cope with conflict.[4] Substantial demand for the relief given by confession is also apparent from the creation of substitutes and the proliferation of fee-based confession services, which focus on overcoming guilt.[5]

Considering these behavioral foundations, it comes as no surprise that "confession is one of the most widespread practices in the world, represented on every continent in every known period of history" (Sullivan, 1987: 233). The common element in different cultures is the verbalization of wrongs committed in order to repair a breach in the relation of the individual or the group with God. In primitive cultures, it was often a restorative and purifying requirement in rites of passage (circumcision, marriage, childbirth, new year), in the preparation of crucial stages of the production cycle (the hunting season) and in the treatment of sickness.[6] This prevalence should help to dispel the misconception that sees confession as a Catholic invention. More to our point, this nature of confession as a "cultural universal" confirms that it is deeply rooted in our minds.

In line with these cognitive perspectives, this article sees institutions—including the Church and, in particular, Catholic confession—as artificial constructs that serve to improve adaptation to a relatively "unnatural" environment, with human reason being one of many decisional mechanisms (Arruñada, 2008). In this conceptual framework, first, institutions—including confession—constrain individuals; second, individuals decide within their biological and institutional constraints; third, individuals, their offspring and their groups enjoy the consequences of such decisions; and, finally, institutions are modified by different means—from imitation to group disappearance—, but mainly as a consequence of relative group performance in a changing technological environment. Therefore, the logic behind institutional arrangements is mainly driven by evolution, adaptation and survival. This view is consistent with findings in

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[4] Post-conflict interaction seems to work as a form of reconciliation, with positive effects for maintaining relationships (Waal, 1997). See also Flack and de Waal (2000: 10-12) and the accompanying discussion.

[5] Two examples: the fee-based "Confession line" telephone service advises callers to "let go guilt and shame" (http://confession900line.com/2395827/, accessed September 8, 2002); and another service claims to be "designed to help you ease the burden of guilt…. Only $15 a month" (http://www.myselfhelp.com/Programs/OG.html, accessed July 23, 2005). Substitutes range from psychological therapy to many vicarious forms, such as talk shows and agony columns.

behavioral economics showing that utility maximization—whatever its merits as a working assumption in many scientific endeavors—is often a poor predictor of actual behavior (see, e.g., Rabin, 1998, and Mullainathan, 2005). More importantly, it indirectly calls attention to the rationalizing function of institutions, such as, in our case, confession of sins,[7] showing again that institutions serve not only to solve problems between individuals but also within individuals, as argued, for instance, by Mullainathan (2005).

4. Historical evidence

The history of confession also supports the main claim in this paper in that it consists of a series of innovations boosting specialization and, consequently, both its enforcement benefits and its agency costs. In primitive Christianity, reconciliation of sinners follows the patterns found in many sectarian movements, including Communism (Riegel, 2005: mainly 113-118): wrongdoers were expelled unless they made more or less voluntary public confession, which was to be followed by harsh penances with not fully reconciliatory effects. This prominence of non-specialized social enforcement is consistent with our argument if we consider that the first Christians were relatively well-off and, therefore, well-educated (Stark, 1996: 29-33).

During the early Middle Ages, confession became reiterable, instead of once in a lifetime; and penance gradually became less harsh and was increasingly performed after absolution instead of before. Confession also became more private, with public confession first reserved for public sins (since the 4th century) and later abandoned; and increasingly addressed to specialists (first to bishops, then to priests). As from the 12th century, instead of priests imposing penances on sinners, they were advised to bargain with them (Tentler, 1977: 17). Penances had to be

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[6] For descriptions in different religions see Aune (1987) and Bianchi (1987).

[7] In particular, demand for confession ties in well with works in behavioral economics that model and test how human beings find it difficult to self-control their behavior and therefore need commitment devices to overcome their bounded rationality in this field. See, for example, the references in Rabin (1998: 38-41) and Mullainathan (2005).

accepted and set in proportion to the individual's strength. At the same time, a more prominent role was given to purgatory, this being a situation of temporal punishment for sinners who were absolved but were not completely free from venial sins, or had not fully paid "satisfaction" for their sins. Finally, annual confession was eventually made obligatory at the 4th Lateran Council in 1215, completing a model that is still in place in the Catholic church.

4.1. How these changes increased benefits

This transformation radically altered the relative importance of the different types of enforcement and provided substantial specialization advantages, mainly of two types. First, private confession to a priest made secrecy possible, and secrecy is more conducive than public knowledge to truly moral, first-party enforcement. Second, priests could accumulate expertise and manage confessions in a professional manner.

Primitive confession can hardly be considered "moral" because of its emphasis on external enforcement. As can be seen today in some religious movements, public confession is often part of sectarian systems that merge moral and social enforcement, minimizing individual freedom (section 5). Compared to previous public confession and penance, private confession fosters the development of first-party enforcement, a genuine moral system which can then work in parallel with an increasingly separated and specialized legal system. Spiritual penalties were introduced once secular ones were in place while, previously, both were merged together (Lea, 1896[1]: 45). Specialization also took place within the religious sphere, as the *internal forum* of conscience for the relation between sinner and God was separated from the *external forum* for the relation between the sinner and the congregation or church. Moral enforcement is therefore separated from social enforcement. The two systems can thus rely on different information and can specialize in different areas of conduct.

Second, having priests hearing confessions made it possible to develop more sophisticated incentives, based on subjective evaluation of performance and face-to-face interaction. On the one hand, priests can set standards of behavior adjusted to individual circumstances, thus

increasing motivation for recurring sinners and making Church membership appeal to a wider range of people.[8] This also reduced the problems posed by the categorical and contradictory structure of moral rules that have to be applied to a wide variety of situations in which compliance is not always socially optimal.[9] On the other hand, confessing to specialists involves face-to-face interaction, allowing the oral expression of guilt and the verbalization of emotional experiences, which have been shown to improve physical and mental health (Pennebaker, 1989, 1997), with probably greater effects than the more abstract confession to God (Krause and Ellison, 2003), and may help improve the internalization of skills and develop a richer mental life (Toulmin, 1979). Confession can thus be effective even when the priest is poorly qualified. Similarly, oral confession reduces the risk of self-deception, by utilizing innate psychological structures, therefore requiring less investment in indoctrination.[10] It also lessens the symmetric risk that strong-willed individuals will set themselves excessively rigorous rules, a risk pointed out by Bénabou and Tirole (2004).

4.2. Innovation in safeguards

These advantages come, however, at the cost of developing specialized human capital and increasing the scope for priests' opportunism. In terms of effort, opportunism goes from providing insufficient access to confession services to performing the function inadequately and taking penance and absolution decisions that are too lenient or too strict. Confessors may also misuse their position to obtain personal benefits, from sexual access or inheritance rights to promoting their own ideology. Furthermore, it also opens new avenues for opportunism at higher

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[8] See, for instance, Delumeau (1992: 293-295) and Tentler (1977: 318-340).

[9] Emphasized by Kaplow and Shavell (2002 and 2007) and Shavell (2002), for whom "moral rules cannot be too detailed and nuanced."

[10] Human brains have evolved innate difficulties for lying (Damasio, 1994), often fall prey of self-deception (Trivers, 1985 and 2000), reach self-serving judgments about fairness (Kahneman and Tversky, 1995) and are well-equipped to detect cheaters (Trivers, 1971 and 1985; Cosmides, 1985 and 1989; Cosmides and Tooby, 1992), all of these being traits that are significantly affected by direct personal contact.

levels in the hierarchy. Some Popes, for instance, sold indulgences conferring salvation, not only remission of temporal punishment.

Growing specialization therefore made it necessary to contain opportunism by devising additional safeguards, most of which were set up around two critical moments (1215, Fourth Lateran Council, and 1545-63, Council of Trent) when the Church faced strong heretical competition in the form of Albigensianism and Protestantism) and reacted to them, with strikingly similar measures.

First, the church invested heavily in reputation and capital, both physical and human: cathedrals were built, the new Gothic and Baroque styles appeared, teaching by example and training were essential in both the Mendicant and Jesuit Orders,[11] and the Council of Trent founded the network of diocesan seminars.

Second, new "product divisions" were set up with an emphasis on confession: in the 13th century, the Mendicant Orders and, in the 16th, the Jesuits. These provided product specialization: Mendicants in preaching and giving example, Jesuits in teaching and both also in confessing and refining the moral code. These orders also brought competition within the church, helping to overcome the laxity and ignorance of the secular clergy, which was organized not on a product basis but on a geographical basis.

Third, rules were developed, including those on jurisdiction and reserved cases (defining who had the right to confess whom about what, with special attention on how priests were also hierarchically controlled by confession), on how to extract confessions (from a system in which priests merely imposed penalties to one in which they negotiated them with penitents), on how to conduct confessions (from regulating postures to mandating the use of confessional boxes in the second half of the 16th century), and on secrecy (seal of confession). Mandatory annual confession has often been seen as exploitative but it was also a safeguard for both penitents and priests—for penitents, because it forced them to self-examine themselves and confess at least

[11] Compare with Schmidtchen and Mayer (1997), who model the licensing of the Mendicants as a way of appropriating rents by the Pope, an argument inconsistent with the greater discretion given to confessors compared to the earlier penitential system.

once a year, helping them to make more consistent choices over time;[12] for priests, because it established a regular pattern that made it harder for them to collude with penitents. Furthermore, annual confession added little in terms of rent seeking, because rents can be more easily captured from penitents close to death and, before annual confession was mandatory, people already confessed before death, which provided plenty of scope for rent seeking.

Fourth, developing and updating of the moral code was dealt with by specialists within the church, instead of being left to informal social interaction or to the confessor priests, leading to the development of Casuistry, a detailed analysis of how good Christians should behave in specific situations. This centralization on moral rulemaking was necessary for guiding and safeguarding priests' decisions, playing a role similar to that of sentencing guidelines in civil judicial systems. It also produced crucial innovations, mainly the key elements in criminal law, such as consideration of aggravating and extenuating circumstances (Berman, 1983: Ch. 4). More generally, it promoted and put into practice a rationalistic, calculating morality, full of trade-offs in its detailed analyses of causes, motives and circumstances.[13] Furthermore, far from freezing the Christian moral code, Casuistry adapted it in parallel with new market relations and urban life.[14]

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[12] In the Catholic faith, good deeds increase the chances of reaching eternal salvation. Believers therefore face the typical intertemporal tradeoff of short term effort versus long term benefits, about which findings in Behavioral Economics show that we tend to make inconsistent choices and procrastinate (see, for a summary and references, Rabin [1998: 38-41]). Applying the argument suggested by Mullainathan (2005) in the context of economic development, by subjecting believers to an annual judgment, annual confession spread pressure over time and this probably helped believers to make more consistent choices about how well to behave in their worldly lives. (The same argument could help explain the signaling role given to good deeds within Calvinism).

[13] Casuistry has often been criticized since the Reformation because of its rationalistic ambitions (for instance, by Adam Smith, 1759, and Henry Lea, 1896). This criticism might be misguided, however. All societies have to produce a moral code, and the question is between more formal, centralized and rationalistic production by specialists (be they priests or, more often now in the West, intellectuals) versus informal, decentralized and emotional production by lay persons. Thus, the rationalism of Casuistry was to be missed later in Protestant theology (Santayana, 1916). See also Jonsen and Toulmin (1988).

[14] Confession manuals, for instance, soon focused on sins committed by professionals in the exercise of their trade, arguably in response to the economic growth and greater specialization achieved during the 13th century (Le Goff, 1980). A similar adaptation in the discussion of sins related to birth control is reported by Biller (1998b). More importantly, the whole idea of purgatory has been linked to economic changes during the first two centuries of the millennium (Le Goff, 1984). The new theology was also

Lastly, theological innovations also provided additional safeguards, mainly through the renewed emphasis on purgatory and ambiguity about the need of contrition for forgiveness. In particular, belief in purgatory kept incentives alive even after absolution, as it motivated penitents to produce additional satisfaction during their lives and after death. Understandably, belief in purgatory grew in importance once penances became less harsh and confession reiterable. Similarly, ambiguities in the theology of confession, which have been criticized as confused (Lea, 1896) and paradoxical (Tentler, 1977: 365), can be explained in terms of optimal deterrence: ambiguous rewards (making salvation depend on a vague degree of contrition and the resolve not to sin anymore) seem reasonable when considered as a subjective evaluation of performance, because they contain the dysfunctional "gaming" behavior induced by a more explicit and objective evaluation, as modeled by Baker, Gibbons and Murphy (1994).

4.3. Alternative interpretations

This costs-and-benefits interpretation of confession acknowledges that its evolution must have created new agency costs, but these might have been only the price of additional specialization advantages over and above agency costs. This view affects, in particular, changes introduced in the 13th and 16th centuries, and departs drastically from the view held in several works by Ekelund, Hébert and Tollison (EHT, 1992, 2002, 2004, 2006) who see purgatory, the sale of indulgences, confession and, apparently, the whole functioning of the Church purely as rent extraction devices.

In their 1992 work, EHT explain the greater role given to purgatory and the restructuring of confession in the 13th century as price discrimination. However, these innovations were introduced at a time of substantial heretical competition, which would make price discrimination

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contemporary with the reappropriation of ancient Greek science, with changes in Christian ethics in favor of technological change (Benz, 1968; White, 1978), and with other theological ideas that have been considered essential for human dignity and liberty (Novak, 1998). A few centuries later, the liberal reversal of the scholastic treatment of usury and many other commercial issues led by the theologians of the Salamanca school was also in step with the problems posed by inflation during the 16th century (Grice-Hutchinson, 1952; Rothbard, 1995: 97-133).

less viable at least in its canonical form. A simple, lower-price interpretation does not fit the facts either, both because the reform upgraded a more lenient practice and because contemporaneous heresies held both higher and even lower standards (Biller, 1998a: 18-23). Again, this does not preclude an evolution in the direction of leniency in later centuries.

Similarly, EHT (2002) argue that rent seeking through price discrimination was the main feature of the system in the 16th century, causing the Reformation.[15] However, EHT disregard an alternative explanation of the Church's price structure, which used higher "prices" for the same sin when committed by wealthier penitents. (Evidence on this pricing structure is clear from penances with a time and, therefore, opportunity-cost dimension and from indulgences, which were usually prized as a proportion of personal income and wealth).[16] This alternative explanation is grounded on the well-established theoretical result that, when wealth varies among individuals, optimal-deterrence sanctions increase with wealth (Polinsky and Shavell, 1991). This makes it difficult to distinguish optimal sanctions from a price discriminating schedule for those sanctions that took the form of monetary compensation going to the Church (and also, usually, to the Crown). Furthermore, in many such instances, when using monetary prices in the remission of time in purgatory, the Church was following a practice that has become a standard recommendation in the economic analysis of criminal law at least since Becker (1968), namely, that fines—being socially cost-free—are more efficient and should be exhausted before resorting to socially costly forms of punishment (for example, Posner, 1998: 246; Polinsky and Shavell, 2000: 70). Overall, explaining the Reformation as a reaction against the Church's rent-seeking is as partial as seeing it as a way of expropriating the Church's wealth, a rent-seeking argument in the opposite direction, which also offers plenty of supporting evidence (Cameron, 1991: 294-96).

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[15] Ekelund, Hébert and Tollison (2002) recognize, however, that rent seeking in itself does not account for the failure of the Reformation to take root in much of Europe. They therefore assume that rent seeking was more prevalent in countries where the Reformation failed and then test this assumption indirectly, through laws on primogeniture. This poses two problems. In addition to the debatable link between primogeniture and rent seeking, their source of data (Swanson, 1967) describes a map of European inheritance customs that runs counter to most published work on the subject (see Le Roy Ladurie [1976: 27], Thirsk [1976: 179, citing Abel, 1958: 154] and Todd [1990: 35]), leading them, for instance, to wrongly classify Sweden and Denmark as areas of partible-inheritance and France and Spain as jurisdictions under primogeniture, which was not the case for most of their regions.

[16] See Lea (1896 [vol. 3]: 155-162, 179-180, 192, 390, 427, 435, 437).

Finally, EHT (2004) interpret the Counter Reformation and, in particular, the reforms decided at the Council of Trent as a mere reduction of the "price" (or an increase in quality) charged by the Church, forced on it by the competition of Reformers and "financed" by lower rent seeking. However, the measures that they summarize (for instance in their Table 1[17]) either change the technology or were designed to reduce agency costs within the Church, an aspect that EHT inevitably overlook as a consequence of seeing the Church as a purely Neoclassical firm. To the extent that the measures succeeded in reducing inefficiencies, such increases in quality do not merely reduce the effective price but also increase the value of services and, more to the point, were financed not from rents previously enjoyed by the Church but from efficiency gains obtained through organizational innovation.

5. Modern confession

The costs-and-benefits explanation also fits in with the modern evolution of the practice of confession in Christianity. Within the main branches of both Catholicism and Protestantism, confession to priests has experienced a protracted decline, leading to greater introspection and general absolution without personal oral confession. The maintenance of confession in many Protestant churches centuries after the Reformation indicates that there was a demand for it on the part of believers and that it may afford benefits. In the mainstream of both Catholicism and Protestantism, the increase in introspection and the decline in oral confession parallel greater education of the laity and economic development. In the fringes of both, many religious movements have also relied on primitive forms of public confession and external enforcement by priests and lay leaders.

[17] For example, EHT consider the establishment of seminars and the strengthening of preaching as advertising (2004: 696).

5.1. Mainstream Christianity

Most Protestant churches retained voluntary confession well after the Reformation.[18] Initially, Lutheran churches kept the duty of confessing to a minister before communion, even though they revoked the annual obligation to confess, suppressed penance, and required the liturgy to emphasize that forgiveness came from God and not from the priest or the Church. There was, therefore, lesser but still substantial specialization. Personal confession was important as late as the end of the 19th century and triggered fierce competition among priests for the fees paid by penitents. Calvin even prescribed annual private confession, though the Helvetic churches soon moved to direct confession to God. The Huguenots also encouraged private confession. The Anglicans retained voluntary confession with priestly absolution, and some sections have practiced it until recently.[19]

In most churches, however, different versions of general confession and absolution became dominant in the centuries following the Reformation. Today, mainstream Protestants confess in silence and directly to God, most often through the general statements of confession and absolution of the Communion service.

The Reformation also triggered substantial changes in the organization and practice of Catholic confession, which are also consistent with the argument in the paper, as they increase introspection and first-party enforcement in addition to agency costs. First, preliminary self-examination was prescribed at the Council of Trent (Lea, 1896[2]: 413, n. 1). Second, the Jesuits, often seen as the army of the Counter-Reformation, emphasized self-examination of conscience and, from their very beginning, were dedicated to educating the laity, developing character and self-control. Third, moral doctrine evolved to increasingly flexible positions, with the exception of a brief period of rigor from around 1640 to 1750 which caused a sharp drop in the practice of confession. This flexibility tried to maximize moral improvement by re-emphasizing individual

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[18] "The abolition of the confessional (as opposed, say, to the abolition of the mass or the removal of images) does not seem to have been a very high priority in the popular reformation. The reformers blew hot and cold over it, intending still to retain some sort of private confession of sins before communion as a means of reassurance" (Cameron, 1991: 308).

circumstances and introspection, reducing the postponement of absolution, giving more weight to preserving personal reputation and requiring full conscience for a sin to be mortal (Delumeau, 1992: 101-148).

More recent evolution confirms these tendencies. Since the last third of the 20th century, confession has been in crisis, as many Catholics do not comply with the annual duty to confess and most of those who do confess have moved away from detailed confession.[20] Furthermore, many parishes practice general group absolution instead of individual confession, using a loophole in Canon law.[21] More importantly, general absolution seems to be preferred by both the laity and the clergy, at least in developed countries.[22] The official position of the Church has yet not changed, however, but it is allowing Catholics who do not confess to remain in the Church, and rules against general confession are being enforced leniently.[23]

This evolution towards greater introspection and less oral confession in mainstream Christianity is consistent with the education argument, according to which the comparative advantage of confession decreases with the level of education of the laity,[24] as educational improvements took place later in Catholicism in parallel with the decline of confession. It is also consistent with the fact that many Protestant churches maintained confession for several centuries after the Reformation, at a time when Protestant regions were not more literate than Catholic regions. Later on, when confession was abandoned in Protestant regions earlier than in Catholic

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[19] In addition to Lea (1896[1]: 515-523), see Caspari (1950: 222-223) and Tentler (1977: 349-351).

[20] Estimates of compliance with the annual duty to confess were around 50% for American Catholics in the 1990s (Davidson *et al.*, 1997; Lee *et al.*, 2000).

[21] General absolution has been widespread, as evidenced by the numerous controversies and confirmation of the formal rules. See, for example, McClory (2001) and Congregation for Divine Worship (2000), Pope John Paul II (1984) and Ratzinger (2002).

[22] These tendencies seem to be universal. Apparently, the demand of many poor Christians (both Catholics and Protestants) living in less-developed countries for a traditional and soundly institutionalized religion, analyzed by Jenkins (2002), seems to be better satisfied by sectarian movements, both Protestant and Catholic, than by traditional Catholic solutions.

[23] Evolution in the Orthodox churches has followed a pattern that also fits the argument. For example, confession is still obligatory in the Russian church (Volkova, 2001) but the American church introduced general absolution in 1972 (Schmemann, 1972).

[24] In addition, a higher level of education could also make confession more costly for the laity.

regions, this took place at a time when literacy rates had switched, becoming higher in Protestant than in Catholic regions.[25] To the extent that education and economic development have evolved in parallel, the same argument applies in terms of a potential cost decrease of confession services.

5.2. Alternative movements

The decline in private confession to priests is also visible in the reliance of both Protestant and Catholic new religious movements on more primitive and less specialized forms of confession and social enforcement: their confessions are often public, and penalties are harsh and may include separation from the group. Within Protestantism, the Geneva of Calvin provided an early paradigm with its intrusive social controls, such as "family visitation," a practice adapted by Calvin from monastic orders and followed to this day by some reformed churches, by which two elders, or an elder and a minister, regularly visit each home to discuss the spiritual health of the family (see, for instance, Jong, 1992-1994). A classic account of these practices was given by Weber in his description of American sects (1920b). More recently, young Protestant churches, like the Church of the Nazarene, still recommend oral confession (Isbell, 2005).

Similarly, Catholic movements, like Opus Dei, Legion of Christ, Focolare, Communion and Liberation and the Neo-Catechumenate rely more on hierarchical and mutual control than on the more subtle mix of first- and third-party enforcement characteristic of sacramental confession. They use frequent and detailed "manifestations of conscience" to lay superiors and denunciation and public confession ("confidence", "fraternal correction" and "brief circle" in Opus Dei), which often overlap and are more important than sacramental confession. The nature of these forms of hierarchical and social enforcement is revealed by their recurrent collision with sacramental confession, going back to the 13th century, when the Templars were accused of receiving absolution from their lay masters (de la Croix, 2005). Much later, the use of manifestation of conscience in monastic orders often led to abusive control of members, until a

[25] See Graff (1987). For a recent analysis of Protestantism as a source of greater literacy, see Becker and Woessmann (2009).

Papal decree drastically limited it in 1890. The decree, however, did not prevent the founder of Opus Dei from considering this practice more important than sacramental confession.[26] The fact that confession was not deemed sufficient in these movements and that it often even collided with these other forms of spiritual direction points to the relatively restrained nature of confession and the greater protection it provides to the individual.

6. Quantitative evidence

6.1. Data and models

The sustained hypothesis of this paper, according to which confession produces both enforcement benefits and agency costs, will now be tested and compared to the alternative rent-seeking hypothesis by examining how the frequency of confession and two other religious practices—praying and attending mass—interact with two stated actions—helping the poor and giving money to the Church. The three religious practices proxy for three types of moral enforcement: prayer, which mostly involves an individual dialogue with God and is unobserved by third parties, represents first-party moral enforcement; confession, which consists of both self-examination and a more or less judicial dialogue with a priest, represents a mix of first and specialized third-party enforcement; and mass attendance, which is communal and is publicly observed by other members of the community, a version of social, non-specialized third-party enforcement. The degree of help directly provided to the poor proxies for the effectiveness of moral enforcement, while the amount of money given to the Church—which poses much more serious agency problems—proxies for agency costs. These two dependent variables are further discussed at the end of the section.

[26] See Walsh for a general description of Opus Dei that emphasizes the conflict between manifestation of conscience and sacramental confession (1989: 112-119); and, for also critical descriptions by former members, Tapia (1994), on Opus Dei; Lenon (2003), on the Legion, and Urquhart (1999) on the rest.

The costs and benefits hypothesis predicts a positive relation between frequency of confession and both action variables. On the contrary, the rent-seeking hypothesis predicts a positive effect on church giving but either a nil or negative effect on helping the poor. That is, rent seeking arguments seeing confession as ineffective predict a nil effect, but those which see it as a price for committing sins (for instance, Weber) predict a negative effect.

To explore the relationship between religious practices and actions, I will first estimate simple models that regress actions on religious practice variables, controlling for demographic features (the education, income, sex, marital status and age of the respondent), using both ordered probits and ordinary least squares (OLS). In these simple models there is a risk that observed associations may be affected by some omitted variable that might be influencing both the outcome and explanatory variables of interest, exaggerating the estimated effects and producing inconsistent estimates. For example, if "generosity" or some other unobservable character trait influences both the propensity to confess and to help the poor, generosity would cause these simple models to overestimate the coefficients of religious practice variables.

To avoid this risk, the models will be re-estimated with two-stage least squares (2SLS), using three variables measuring the intensity of three different religious practices at the time the respondents were growing up (frequency of confession, prayer and mass attendance) to instrument explanatory variables on current religious practice. Instrumentation amounts to using only part of the variability in the explanatory variables (the part linked to the instruments) to estimate their relationship with the outcome variables. In our case, it uses only the variability in current religious practice (confession, prayer, mass attendance) due to childhood religious practice to estimate the connection between current practices and stated individual actions (helping the poor and giving money to the church).

The estimates so produced will be consistent as long as the instruments are correlated with the explanatory variables but are orthogonal to the omitted variables. Correlation with explanatory variables can be argued in terms of habit formation and is confirmed empirically by the high significance of the relevant coefficients in the first-stage regressions (Table 3), especially those for the corresponding past and current practices. Orthogonality between the instruments and the error term is harder to establish, given our ignorance about such omitted variables. However, even if childhood religious practices may affect some current character traits of individuals, the

models do measure the effect of religious practices (e.g. confession), irrespective of when (now or in childhood) these practices took place.

The data come from a survey conducted in 1994 on 4,554 Indiana Catholics, and the variables are summarized in Table 1.[27] All variables, except sex and marital status, have been standardized to have mean zero and standard deviation one.

The same dataset will be used to test the education proposition, according to which education enhances moral self-enforcement, making priests' intervention less necessary or efficient. It therefore predicts that more educated Catholics will confess less frequently. This effect of additional education on confession frequency will be estimated controlling for all the variables used in the first stage of the instrumental variables models: demographic controls and childhood practice, both of which are exogenous.

Finally, I will test the cost-disease proposition. This contends that confession to priests, being a personal service that does not admit technical change, is vulnerable to economic development and productivity increases in the rest of the economy. I will examine whether the number of Catholic priests per million Catholics varies in a cross-section of countries having different degrees of economic development (proxied by GDP per person) in the same way as the density of professionals. The test will be performed by estimating the numbers of priests and physicians as a quadratic function of GDP, positing that the GDP coefficient will be positive and that of GDP^2 will be negative. The priest equation will be estimated with and without controlling for religious vocation, which, if understood as a form of on-the-job consumption, allows estimation of the density of priests driven by the value of priest's services to the laity.

6.2. Results

The econometric results presented in Table 2 are more consistent with the costs-and-benefits hypothesis than with the rent-seeking hypothesis. In particular, probit and OLS results show that

the coefficient of the frequency of confession is significantly and positively related to the propensity of Catholics to help the poor. This interaction seems to be even greater than the also positive relationship observed in the amount of money given to the church. Furthermore, the coefficients of confession are in line —both in sign and significance—to those of praying to God, a practice close to first-party enforcement. Comparing the confession coefficients with those obtained for mass attendance is also revealing, because attending mass more often (which might be taken as a proxy of non-specialized social enforcement) is not only associated with giving substantially more money to the church but seems to be ineffective in terms of good actions, as shown by the insignificant effect on helping the poor. Furthermore, all these results are robust to different specifications and to the inclusion of additional control variables, such as the fact that the respondent and ancestors were born in the USA, the level of education of the respondent's parents, and the respondent's intensity of belief in hell, heaven and salvation, as well as to other outcomes, such as volunteering in church activities.

These estimates of how individual actions (helping the poor and church giving) correlate with the intensity of religious practices (confession, prayer and mass attendance) differ substantially from those obtained with the IV regression. OLS may therefore produce inconsistent estimates under the IV assumptions. However, the IV estimates also confirm the costs-and-benefits hypothesis, especially because confession frequency is the only religious practice positively and significantly related to helping the poor. Furthermore, this IV estimate is substantively highly significant: one standard deviation in confession frequency is associated to an increase of 1.372 standard deviations in helping the poor.

All in all, for this sample of Catholics, confession of sins appears to be effective in improving enforcement of the moral code. In addition, when compared to other religious practices, confession seems to be more effective than attending mass (our proxy of social non-specialized enforcement) and not more "exploitative" than both praying to God and attending mass. Because the metric scale for the variables is not clearly established, comparing the effects of the explanatory variables is not fully appropriate when they have significant coefficients of the same

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[27] Originally collected by James D. Davidson and available with detailed information at the American

sign,[28] as happens in some of the *Give Money to Church* equations. However, considering that standardized variables are been used, it is unlikely that distortions introduced by treating ordinal variables as metric variables will overcome the substantial differences in the estimated coefficients (the coefficient of attending mass might be as high as ten times that of confessing sins).

Some reinterpretations of the variables would reinforce the view of confession as a technology of moral enforcement, because the *Help the Poor* variable is less ambiguous than the *Give Money to Church* variable. Helping the poor is clearly linked to compliance with the Catholic moral code while giving money to the Church might measure the Church's rents but also compensation for greater use of the Church's services or —especially for money given secretly— moral compliance. In other words, understanding money contributions as exploitation is doubtful for two reasons. First, most money collected by the Church is not captured as rents but used to finance Church activities and charities. This issue brings us back to the criticism of EHT in section 4.3 because EHT consider all Church revenue as rents. In terms of the econometric model, this leads us to consider *Give Money to Church* as a proxy of moral enforcement, an interpretation that —considering its positive coefficient in some equations— would further refute the rent-seeking hypothesis, as confession would also be effective in this dimension of moral enforcement. Consequences for the costs-and-benefits hypothesis are less clear because the absence of agency costs may result from active organizational safeguards, as explained in section 4.2. A second interpretation relies on the private benefits provided by confession, which may lead those Catholics who confess more to compensate the Church more for their greater consumption of Church services. This would tie in with the historical practice of paying a fee to confessors.

A preliminary test of these ideas was implemented by considering *Help the Poor* as a proxy for moral compliance and introducing it as an additional control in different variants of the model in Table 2 (with and without interaction with confession frequency, as well as running individual regressions for the different levels of help provided to the poor). The resulting coefficient

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Religion Data Archive (www.thearda.com, accessed November 15, 2005).

[28] See, however, Labovitz (1967, 1970) and Kim (1975), who show how correlation coefficients are quite robust with respect to ordinal distortions in the measurement.

estimated for the frequency of confession does not change substantially with respect to Table 2 and remains significantly positive. This provides some additional support for the role of confession in increasing agency costs as well as benefits, as those Catholics that confess more seem to give more money to the Church even after controlling for moral compliance. These results must be handled with extreme caution, however, because of the heroic assumptions behind the analysis. Furthermore, there are no good proxies available for the private benefits of Church services. For instance, education could be controlling for some private benefits but not for others if educated Catholics get less value from confession than from mass attendance.

Models shown in Table 3 (which are the first stage of the IV regressions, as explained in section 6.1) also support the hypothesis that improved education of the laity reduces the demand for confession. Above all, education presents a negative coefficient on confession frequency that contrasts with the positive and statistically significant coefficient on prayer frequency. More educated people also help the poor more and contribute more to the Church (Table 2), which is consistent with the idea that education reinforces moral, purely first-party, enforcement.

Finally, data on the density of Catholic priests is consistent with the cost-disease hypothesis as the interaction between the number of priests per million Catholics and GDP is similar to that of other professionals, showing a concave relation to GDP (Table 4). The table only presents results for doctors but all the professions considered (dentists, nurses and pharmacists) show similar results. Column (3) introduces the number of Catholic nuns as a proxy of "vocation". If vocation is omitted, estimation of the coefficients of GDP in the number of priests equation might be distorted. This use of the vocation proxy is grounded on the fact that Catholic priests act as intermediaries with God (confessing and absolving sins, and celebrating Eucharist) while most nuns perform more mundane tasks, such as caring for the sick and educating youngsters. Results with the vocation control are even more significant. Using the percentage of Catholics in the population and an index of political rights to control for the mix of priestly activities does not significantly modify the results.

These results tentatively indicate that priests' services are likely to suffer a cost disease similar to that of other professional services, even if the tests should only be taken as a first try, given the limitations of cross country data and the frugality of the model.

However, to the extent that such results point in the right direction, the consequences are more serious for private confession than for other priests' services, such as preaching, which are more hospitable to technical innovation. On the contrary, innovation is severely constrained in confession because it requires personal interaction and physical capital is not a good substitute.[29] In fact, the Catholic church requires a personal encounter, precluding confession via e-mail, written letters or even the telephone, a requirement which is consistent with the cognitive fundamentals summarized in section 3. The consequences of this constraint can be illustrated by considering the productivity and price of health care if there were no pills or machinery. As we observe in other personal services, from medicine to music, technical change is possible but often involves some degree of self-service and drastic changes in the nature of the service. This might well be also the case of confession of sins.

7. Summary and concluding remarks

Contrary to partial rent-seeking views, this article shows that Catholic confession responds to the common trade-off of specialization advantages and agency costs. Specialization advantages come from having priests acting as first-instance judges of moral conduct, both completing and enforcing a moral code for the purpose of self and social control. As with any specialization, however, confession is also subject to agency costs. This trade-off of specialization advantages and agency costs changes with both external circumstances and the functioning of safeguards controlling agency costs.

The argument was tested on behavioral, historical and econometric data, comparing its explanatory power with respect to the alternative rent-seeking story.

First, cognitive sciences provide solid grounds for both the benefits and the costs sides of the argument. The moral sense, religion and, in particular, confession are shown to both rely on and

[29] Confession is labor-intensive. Jesuit priests at a New York parish confessed an average of 11,142

control ancient instincts that may be maladapted in our current environment. Experimental psychology also shows that repentance and forgiveness produce cooperative and psychological benefits. Work in cognitive sciences also suggests, however, that religiosity could be a parasite in our mental endowment that may be misused by experts (priests in Catholicism) for their own benefit.

Second, the history of confession also supports the costs and benefits argument. Privatization of confession in the Middle Ages made possible the evolution towards truly moral, first-party enforcement, which can thereafter work in parallel with increasingly separated and specialized legal systems. Private confession is also conducive to developing human capital specialized in confession as well as implementing a more sophisticated and allegedly more motivating system of incentives. It also provides greater scope for exploitation, however, and this is shown in the historic struggle to implement more effective safeguards against priests' opportunism. The evolution after the Reformation also fits the argument when considering that confession declines slowly in most Protestant churches after the Reformation and, in both Protestant and Catholic areas, seems to parallel increases in education. Similarly, primitive forms of public confession re-emerge in sectarian movements within both Protestantism and Catholicism, leading to oppressive forms of social, non-specialized enforcement.

Third, econometric results support the view that confession to a priest is effective in moral enforcement, as those Catholics who confess more often also help the poor more. Confession also seems to be more effective than other religious and not exclusively Catholic practice: attending mass. There is also some support for the presence of agency costs, but not for greater agency costs in confession than in praying or attending mass. On the contrary, the estimated impact of attending mass is greater, and this difference is not likely to be due to scaling problems.

The data also hints at the dynamics of the costs-and-benefits trade-off. First, more educated Catholics confess less, which is consistent with the claim that better education makes first-party enforcement easier and, therefore, the role of third party enforcers less necessary. Second, the supply of Catholic priests follows a pattern similar to professionals providing personal services:

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confessions in a year at the end of the 19th century (O'Toole, 2000).

its rate of growth decreases with GDP, even after controlling for religious vocation. Priests' services therefore need the kind of technical change that allows doctors to increase their productivity. However, technical change would drastically modify confession by diminishing personal interaction.

So, despite its apparent effectiveness, confession faces difficulties in coping with better education and suffers a productivity gap rooted in its inter-personal nature. These demand and supply factors complement each other in explaining the decline in confession. The likely permanence of these trends suggests that survival of the institution is uncertain.

The costs-and-benefits tradeoff can be applied to other contexts and other moral enforcement mechanisms. For example, the role of scholars in traditional Islam have been seen as a form of intermediation between God and believers that is increasingly absent in modern political Islam (Feldman, 2008). More generally, the growing role of education and the mass media in conforming morality opens up new opportunities for both specialization advantages and agency costs, and poses the more basic question regarding how we are now writing and enforcing the moral code. Specialization advantages are certainly attained by formal education systems while informal education depends more on market forces and occasional herding behavior. Agency costs are also present, however, in both the formal and informal processes, as exemplified by the occasional alleged capture of some formal education systems by teachers and of mass media by elite journalists.

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Table 1. Description of variables and summary statistics

Variable	*Description in terms of the original survey question*	*Name of variables in survey*	*Obser-vations*	*Mean*	*Std. Dev.*	*Min.*	*Max.*
Confession Frequency	How often do you go to private confession with a priest? [a, b, c]	45) *doconfes*	4,314	0	1	-0.811	5.864
Prayer Frequency	How often do you start and end the day with a prayer? [a, b, c]	54) *doprayer*	4,352	0	1	-1.688	0.857
Mass Frequency	How often do you attend mass? [a, b, c]	41) *domass*	4,356	0	1	-3.565	1.866
Help the Poor	How often do you actively work to help the poor? [a, b, c]	50) *helppoor*	4,278	0	1	-0.899	2.729
Give Money to Church	How much money did you give to the Church in 1993? [b, c, e]	90) *churgive*	4,175	0	1	-1.966	3.463
Education	Highest number of years of schooling you have completed [c, f]	246) *educlevl*	4,421	0	1	-1.666	2.233
Income	Personal and spouse's income received in 1993 before taxes [c, g]	277) *income*	4,015	0	1	-1.613	2.393
Male	1, men; 0, women	158) *gender*	4,166	0.358	0.480	0	1
Single	1, if single; 0, otherwise	262) *marystat*	4,352	0.124	0.330	0	1
Age	Age of the respondent [c]	159) *yrborn*	4,183	0	1	-1.891	2.614
Confession Frequency when Kid	How often did you go to confession when your were growing up? [a, b, c]	196) *kidconfs*	4,324	0	1	-1.653	2.695
Prayer Frequency when Kid	How often did you start and end the day with a prayer when your were growing up? [a, b, c]	205) *kidprayr*	4,291	0	1	-2.300	0.659
Mass Frequency when Kid	How often did you attend mass when your were growing up? [a, b, c]	197) *kidmass*	4,321	0	1	-2.451	0.996

Notes: Source of data: n. 27. [a] Possible answers were: 1, Daily, almost daily; 2, Several times a week; 3, Weekly; 4, 2 or 3 times a month; 5, About once a month; 6, Several times a year; 7, 1 or 2 times a year; 8, Never, almost never. [b] Variables were recoded to make them consistent with their names. [c] Variables standardized to be mean zero variance one. [d] Possible answers were: 1, Very active; 2, Quite active; 3, Somewhat active; 4, Not active. [e] Eight possible answers ranging from 1 for "did not give to this" to 8 for "$10,000 or more". [f] Possible answers were: 1, Grade school or less; 2, High school; 3, Vocational training after high school; 4, Attended college, but did not graduate; 5, Graduated from college; 6, M.A, M.S., M.B.A., or equivalent master's degree; 7, Ph.D., M.D., LL.B., or equivalent doctorate degree. [g] Twelve possible answers ranging from 1 for "less than $10,000" to 12 for "$150,000 or more".

Table 2. Moral behavior (*Help the Poor*) and rent extraction (*Give Money to Church*) as determined by different religious practices in a sample of Catholics

	Ordered probit regressions		*Ordinary Least Squares regressions*		*Instrumental variables regressions* (*Confession, Prayer and Mass Frequencies* instrumented with *Confession, Prayer and Mass Frequencies When Kid*)	
	Help the Poor	*Give Money to Church*	*Help the Poor*	*Give Money to Church*	*Help the Poor*	*Give Money to Church*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Confession Frequency	0.133***	0.052**	0.132***	0.040**	1.372*	-0.947
	(0.024)	(0.024)	(0.021)	(0.017)	(0.770)	(0.639)
Prayer Frequency	0.165***	0.071***	0.123***	0.051***	0.030	0.239*
	(0.023)	(0.022)	(0.020)	(0.015)	(0.147)	(0.122)
Mass Frequency	0.006	0.575***	-0.010	0.362***	-0.047	0.150
	(0.022)	(0.024)	(0.020)	(0.015)	(0.277)	(0.229)
Education	0.144***	0.096***	0.140***	0.065***	0.192***	0.022
	(0.024)	(0.024)	(0.021)	(0.017)	(0.046)	(0.038)
Income	0.095***	0.573***	0.066***	0.406***	0.138**	0.355***
	(0.025)	(0.026)	(0.022)	(0.017)	(0.054)	(0.045)
Male	-0.158***	0.176***	-0.126***	0.119***	-0.152**	0.158***
	(0.043)	(0.043)	(0.038)	(0.030)	(0.066)	(0.054)
Single	0.242***	-0.172**	0.221***	-0.050	-0.079	0.165
	(0.070)	(0.071)	(0.062)	(0.049)	(0.197)	(0.163)
Age	0.130***	0.385***	0.137***	0.267***	-0.096	0.477***
	(0.026)	(0.026)	(0.022)	(0.018)	(0.175)	(0.145)
Constant			0.003	-0.005	0.088	-0.076
			(0.024)	(0.019)	(0.065)	(0.054)
Observations	2733	2733	2733	2733	2733	2733
Pseudo R-squared	0.02	0.19				
R-squared			0.08	0.45		

Notes: Ordered probit (equations [1] and [2]), OLS ([3] and [4]) and instrumental variables ([5] and [6]) estimation. In equations (5) and (6), *Confession Frequency*, *Prayer Frequency* and *Mass Frequency* were instrumented with *Confession Frequency when Kid*, *Prayer Frequency when Kid* and *Mass Frequency when Kid*. First stage regressions presented in Table 3. Standard errors in parentheses. *, **, *** significant at 10, 5 and 1%.

Table 3. Demographic determinants of religious practice

(first-stage regressions of instrumental variables equations in Table 2)

	Confession Frequency	*Prayer Frequency*	*Mass Frequency*
	(1)	*(2)*	*(3)*
Education	-0.038*	0.033*	0.014
	(0.020)	(0.020)	(0.021)
Income	-0.069***	-0.089***	-0.010
	(0.021)	(0.020)	(0.022)
Male	0.007	-0.239***	-0.062
	(0.036)	(0.035)	(0.038)
Single	0.230***	-0.055	-0.133**
	(0.058)	(0.057)	(0.063)
Age	0.196***	0.229***	0.263***
	(0.022)	(0.021)	(0.023)
Confession Frequency when Kid	0.050*	-0.039	-0.148***
	(0.026)	(0.025)	(0.028)
Prayer Frequency when Kid	0.039**	0.425***	0.108***
	(0.020)	(0.019)	(0.021)
Mass Frequency when Kid	-0.030	-0.127***	0.126***
	(0.025)	(0.025)	(0.027)
Constant	-0.064***	0.074***	0.030
	(0.023)	(0.022)	(0.024)
Observations	2773	2773	2773
R-squared	0.07	0.24	0.08

Notes: OLS regressions, also used in the first stage of the estimation of equations (5) and (6) of Table 2
Standard errors in parentheses. *, **, *** significant at 10, 5 and 1%.

Table 4. Density of Catholic priests in a cross-section of countries

	Dependent variables:		
Explanatory variables:	*Physicians per 100,000 population* *(1)*	*Catholic priests per million Catholics* *(2)*	*Catholic priests per million Catholics* *(3)*
GDP per capita in 1999 (constant 1995 US$10^4)	106.214*** (34.804)	576.270*** (187.071)	185.349** (79.983)
Square of GDP per capita in 1999 (constant 1995 US$, 10^4)	-17.560** (8.610)	-83.061* (46.495)	-42.812** (19.255)
Catholic female religious per million Catholics			0.383*** (0.021)
Constant	182.113*** (22.641)	313.909** (125.313)	123.378** (52.630)
Observations	65	68	68
R-squared	0.21	0.25	0.88

Notes: OLS regressions. Standard errors in parentheses. *, **, *** significant at 10, 5 and 1%.

Sources of data: Priests and nuns, http://www.catholic-hierarchy.org/. WHO Estimates of Health Personnel around 1998, http://www3.who.int/whosis/health_personnel/health_personnel.cfm?path=whosis,health_personnel. Both web pages accessed on July 9, 2005. GDP data from the World Development Indicator 2001, World Bank.