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Religion as a Credence Good
and the Case Against Galileo

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Abstract

In 1633, the Papal Inquisition condemned Galileo Galilei as a heretic for attempting to rationalize Catholic scripture with Copernicus' theory of heliocentrism. Nearly four centuries later, heliocentricity is widely accepted, and the Roman Catholic Church boasts one of the finest astronomical observatories in the world. What might account for such a radical shift in Church policy? Credence good theory offers an explanation. According to this theory, it is vital to establish and maintain a reputation if a credence good supplier is to survive. An examination of the credence qualities of religion reveals this to be true in the religious marketplace. Paying particular attention to the Roman Catholic Church, this article reveals reputational maintenance to be a driving force behind the Church's response to Galileo. Furthermore, the theory explains how a longer-term strategy of reputational maintenance continues to influence the Church's policy as it prepares to meet similar challenges in the future.

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Credence goods are a particular type of good for which consumers have no measure of quality before, during, or after consumption. Instead, customers rely on the guidance of an expert seller to determine their needs. Credence goods stand in stark contrast to search goods and experience goods because consumers can at some point gauge the quality of those goods.¹ This occurs before consumption with search goods and during or after consumption with experience goods. For instance, we can observe the picture and sound quality of a television (a search good) before purchasing it, and we can determine the quality of a meal at a new restaurant (an experience good) once we have sampled the food.

Credence goods are common in markets for expert services, such as repair, legal, and medical services. These markets are plagued by information asymmetries that typically favor the expert sellers and create an environment that is ripe for opportunism. Consequently, it is easier for sellers in these markets to exhibit fraudulent behavior than is the case for sellers in markets for search goods and experience goods.

Religion has been described as a credence good. When compared to more conventional markets, the market for religion might appear to be an obscure choice for analysis. However, it is precisely because the religious marketplace is nontraditional that it presents an opportunity to test the wider applicability of credence good theory.

In the interest of simplicity, I have limited my analysis to Christianity, in particular the Roman Catholic Church. Catholicism is perhaps the most appropriate branch of Christianity to explore for two reasons. First, that the Church maintains a position of great influence in many parts of the world makes it relevant for a case study. Second, because the Catholic Church has endured as an organization for nearly two millennia, an examination of the Church offers a wider array of examples from which to choose than most alternatives do. Finally, although most of the evidence presented here is anecdotal, the Church has gone to great lengths to keep and preserve records, so at least some empirical data exist on which we can base conclusions.²

My objective in this article is to demonstrate how the potential for fraud in a credence good market can influence the behavior of an expert seller. In particular, this offers an economic explanation for the medieval Church's response to Galileo's scientific discoveries as well as some of the actions that the Roman Catholic Church has taken more recently. Consequently, I have organized the main body of this article into five parts. In the first section, I consider the basis for analyzing religion as a credence good. In the next two sections, I explore the potential for

¹ Nelson (1970, 1974) was the first to distinguish between these two types of goods.

² Innumerable studies in the still emerging field of economics and religion have pointed out the intense difficulty in gathering hard data from both historical and contemporary sources (see Iannaccone 1998).

fraud in the credence market for religion and discuss the importance of seller reputation. In the fourth and fifth sections, I discuss the extent of the threat that Galileo posed and the lasting consequences of the Church's response. These sections are followed by concluding remarks and suggestions for further research in the area.

RELIGION AS A CREDENCE GOOD

The most prolific attempts to evaluate religion as a credence good can be attributed to Ekelund, Hébert, and Tollison in *The Marketplace of Christianity* (2006) and to Witham (2010). However, the idea originated with Iannaccone (1998), who refers to religion as “the ultimate ‘credence good’” because of the potential risk associated with religious participation, namely, the personal investment in time and effort that might never be recouped. Ekelund, Hébert, and Tollison focus their attention on the problem of verifiability. They describe religion as a “meta-credence good” because the quality of the product is “unknowable” (Ekelund, Hébert, and Tollison 2006: 28). Witham (2010: 61) emphasizes further the degree of trust that is required of consumers in the provision of religion, “the credence good par excellence.”

Religion therefore appears to be a special case among credence goods, as demonstrated by the way in which the term has been applied. The reason for this is perhaps best understood within the context of Iannaccone's (1998: 1466) definition of a religion as “any shared set of beliefs, activities, and institutions premised upon faith in,” particularly, “*supernatural* forces [italics added].”³ In contrast, credence good theory has traditionally focused on temporal markets. Distinguishing religion further, however, requires that we identify the product of religion. What exactly are religious suppliers offering?

Ekelund and colleagues (1996) claim that the primary role of the medieval Church was to inform and guide individuals toward the attainment of eternal salvation. Even in today's society, the belief in an afterlife is common among major religions. For the purpose of this article, I adopt the view that the product of religion is the knowledge required to attain salvation. Moreover, I interpret salvation as the deliverance of the soul from sin and the inheritance of eternal life. This incorporates the concepts of final salvation on an individual level as expressed in the *Catholic Encyclopedia* (Maas 1912), and I believe that it closely approximates Ekelund and colleagues' (1996) use of the term.

When we shift our focus to the supernatural realm of salvation, it is clear that consumers themselves cannot verify the existence of eternal salvation, either before they choose to follow a particular path or once they have selected a path (or

³ Since Iannaccone introduced this definition in his seminal survey of the literature on economics and religion, it has become something of a standard among economists studying religion.

religion). This, of course, applies to other credence goods as well. However, religious suppliers are no more capable of verifying the true existence of salvation from their own experience than are their customers. That neither the buyer nor the seller can be certain of the actual outcome is unique to religion.⁴

Although religion does exhibit some extraordinary qualities, to say that it is a credence good implies that consumers are likely to be wary of claims made by religious suppliers. In short, consumers fear fraudulent behavior on the part of an expert seller. Let us therefore explore further the prospect of fraud in the religious marketplace.

THE POTENTIAL FOR FRAUD IN RELIGION

Darby and Karni (1973) describe fraudulent seller behavior in a credence market as the intentional misrepresentation of the quality of a good or service. A common example would involve a mechanic overproviding or underproviding a service—also known as overtreatment or undertreatment, respectively—or simply overcharging.⁵

Different types of fraud may exist depending on the circumstances in the marketplace. For instance, there is the potential for fraud if one or more of the following conditions is met: Consumers are unable to verify the type of treatment received, seller liability is lacking, there are economies of scope (implying that the buyer and the seller are committed to one another), or consumers are nonhomogeneous.⁶ In this section, I consider each condition with regard to the Catholic Church.⁷

Verifiability

Economists have often described the organizational structure of the Catholic Church as that of a vertically integrated firm or a franchise (e.g., Davidson 1995; Terkun 2010) or that of a multidivisional corporation (Ekelund et al. 1996). Each designation implies some degree of leadership from above—for instance, in

⁴ This is quite different from a mechanic, who knows whether he or she is providing a customer with the appropriate level of treatment based on a diagnosis.

⁵ Not surprisingly, credence goods and experience goods overlap in terms of types of fraud. Undertreatment is possible in both types of markets, but overtreatment and overcharging are problems that are associated strictly with credence goods (see Dulleck, Kerschbamer, and Sutter 2009).

⁶ Dulleck and Kerschbamer (2006) neatly sum up these conditions after scouring the existing literature on credence goods.

⁷ It is worth noting that although a credence good introduces the possibility of fraud, this does not mean that the seller must be engaging in such behavior. What is significant is not whether there is fraud, but whether the conditions exist for customer concerns to be valid in this regard. That the potential for fraud exists is sufficient.

regard to product development and administration—while distribution of the product is left to the lower levels or divisions. For example, the members of the clergy, including bishops, priests, and monks, act as conduits between the Church and the general public. Therefore it is fitting for us to examine the potential for fraud at each of these organizational levels.

At the top tier (i.e., the institutional level), the Church is the source of knowledge or information for attaining eternal salvation as well as the regulator thereof. However, because it is impossible for anyone living—including members of the clergy—to experience salvation, the question remains whether salvation in fact exists or, more to the point, whether the Church at the highest echelon is deceiving its customers by marketing a phony product.

Of course, some degree of uncertainty affects experts across all markets for credence goods. Even after diagnosing a problem, doctors, plumbers, and mechanics do not know whether their prescribed treatment has been successful until they themselves verify the outcome (even if we assume that they intend to provide the optimal level of treatment). However, verification by the seller is possible at some point. On the other hand, expert sellers in the market for religion cannot themselves verify their product (i.e., salvation).

The trouble is that one cannot know for sure whether salvation exists, since any measurable form of consumption in the religious marketplace is confined to the earthly realm. Without such information, we can make no claims of fraudulent behavior on the part of the Church. The matter is therefore reduced to faith: People either believe the Church's claims or choose not to participate.

Is it important whether people who consume a religion believe in it? This is an interesting question to consider, since it is possible that some people consume religion even though they do not believe. For instance, during the Inquisition, many Muslims and Jews were forced to convert to Christianity or risk losing their lives. There are also people who participate in religion to boost their reputation, for reasons of tradition, or simply to feel part of a group. However, I contend that fraud, as defined by Darby and Karni, cannot be committed against people who consume a credence good but do not believe in its properties, since they do not expect a certain quality. For these individuals, there is no opportunity for swindling, and the expert seller does not commit fraud; the consumer is neither over-treated nor undertreated, nor is the consumer overcharged. The term *fraud* is simply inappropriate in this context. Therefore in this article, I focus only on consumers who believe in salvation.

According to Ekelund, Hébert, and Tollison (2006), it is possible to consider the religious product as being composed of several types of goods. For example, religion can affect society as a whole (including nonadherents) by promoting a stable environment through self-monitoring, provide a more intimate forum for social interaction, or offer comfort for individual suffering. Therefore from an

economic standpoint, religion is a public good, a club good, and a private good. Religion is, as Ekelund, Hébert, and Tollison aptly point out, a joint product.

Building on this idea that the religious product is multifaceted, let us turn to the distribution of religious services, for which the clergy, in particular, is responsible. These are the daily operations of the Church and include, but are not limited to, the provision of the basic sacraments. Given the constant and direct interaction between clergy and church members, there is an increased probability that the traditional types of fraud noted earlier—overcharging, overtreatment, and undertreatment—will be encountered.

According to Dulleck and Kerschbamer's (2006) review of the literature on credence goods, overcharging is the preferred method for exploiting consumers if conditions are suitable, that is, if consumers are unable to verify the type of treatment that they receive. Only overcharging coupled with undertreatment is superior from the point of view of perpetrators of fraud, though in reality, this strategy is less common because it creates a lemons problem (Akerlof 1970), which may lead to the complete cessation of market activity.⁸ If overcharging is impractical, then overtreatment is the next best alternative. As was noted earlier, it is not possible to verify salvation, and although some clergy services are verifiable (Sunday Mass, holy Communion, and confession), others such as prayer outside of church, the quality of advice related to life issues and guidance on matters of faith, and attributes expected of clergy—such as honesty—are not.

It is difficult, if not impossible, for a seller to overcharge for services unless explicit prices exist, and since most compensation for religious services today takes the form of voluntary donations, overpayment for religious services cannot be measured. This is in contrast to the medieval Catholic Church, which regularly charged fees based on explicit prices for services, particularly with regard to marriage and indulgences.⁹ Therefore fraudulent behaviors such as overcharging and overtreatment were more likely to occur historically. However, overtreatment is not now entirely ruled out. Donations do not preclude sellers from attempting to influence payment. For instance, priests often espouse the need for followers to make confessions and to take communion more frequently, regardless of how often they may already do so.¹⁰ Furthermore, in many parishes in the United States, followers are obliged to fulfill a series of requirements before receiving the sacrament of Confirmation; these requirements constitute a form of tying (requiring customers of one product to buy one or more other products).

⁸ A stereotypical example of the lemons problem is the asymmetry of information that occurs in a used car market, leaving the buyer unable to make an informed decision. Potential buyers who are concerned about purchasing a "lemon" might drop out of the market altogether.

⁹ For further information on papal revenues in the Middle Ages, see Lunt (1934).

¹⁰ Forbes and Zampelli (1997) find a positive and statistically significant correlation between regular church attendance and contributions.

Liability

In the absence of seller liability, less than optimal quality (undertreatment) is expected. The presence of this type of fraud, however, does not necessarily indicate a credence good, since undertreatment is also common among experience goods. Rather, overtreatment and overcharging are most prevalent for credence goods. Moreover, as Dulleck and Kerschbamer (2006) point out, consumers are most put off by undertreatment, since they receive at the least the optimal treatment in the cases of overtreatment and overcharging.

Liability implies that the expert seller is subject to some sort of punishment when the seller supplies a less than optimal quality of service. One might argue that according to the Church, everyone (including clergy) is subject to a final judgment, the penalty of which may be purgatory or, worse yet, hell if one is dishonest. This works only if the seller also believes in the product and is honest; otherwise, fraud will not exist under these circumstances. However, the recent child abuse scandals affecting the Church suggest that liability is lacking. Consequently, a worldly means of punishment may be necessary for consumers to observe.¹¹

Commitment

The potential for opportunism increases when economies of scope exist between the diagnosis and treatment of credence services (Dulleck and Kerschbamer 2006). For example, there are economies of scope in replacing a customer's brake pads when rotating the wheels of the customer's car. Moreover, the larger the economies of scope, the more committed a customer will be and the more likely the customer will be to remain for treatment with the expert who made the initial diagnosis.

Similarly, with regard to religion, the greater the investment in religious human capital—which Iannaccone (1990) defines as “the skills and experience specific to one's religion”—the more likely one is to accept new doctrines introduced by that religion and the less likely one is to seek out alternatives. Therefore establishing economies of scope is more important for an expert seller in a competitive market than in a monopolistic setting.

But how does the Church diagnose and treat its followers? According to one interpretation of the Catholic doctrine of original sin, human beings are born with the capacity to commit sinful acts and therefore are deprived of sanctifying grace (i.e., the gift of eternal salvation). Because this applies to all human beings,

¹¹ It is possible that the Church has not already implemented this form of liability because it minimizes the idea of a higher form of judgment to which we are subject and therefore cannot compete.

everyone is subject to the same initial diagnosis. The prescribed treatment is embodied in the Church's sacraments. All Roman Catholics are in practice expected to participate in this basic set of services.¹² The sacraments ostensibly offer opportunities to become closer to God and ultimately form a path to eternal salvation. Treatments may also be tailored individually on the basis of one's confession and according to the specific sins one has committed.

Establishing basic requirements also makes it easier for the Church, as an expert seller, to monitor the progress of its followers. This is particularly important in the case of credence good markets, in which experts sometimes offer warranties that can lead to moral hazard issues. At a minimum, a warranty introduces liability and prevents undertreatment.¹³ However, the customer has little incentive to maintain the aspects of the good that are covered by the warranty. Consider parts or repairs provided under the warranty for a vehicle. To counteract this effect, experts may require regular checkups (at least initially) or that only the original seller performs the services.

Although the basic liability effect of a warranty serves the customer, it is just as valuable a tool for the seller. The presence of a warranty can create an exclusive relationship between a buyer and the seller. Although the Church does not offer a warranty per se for salvation, the sacraments similarly create a powerful union between parties by promoting repeated interaction. Note that the sacraments span a person's full corporeal life, thereby binding Catholics to the Church from birth to death.

Furthermore, warranties can bolster a seller's reputation. Generally, consumers are more likely to purchase a product that has a warranty—or one that has a longer warranty than is offered by competitors—because the consumers believe that the warranty signals a similar degree of confidence on the part of the seller in the quality of the product.¹⁴ This tends not to be a bad rule of thumb, since profit-maximizing sellers who hope to remain in the market over the long run would be foolish to sell a poor-quality product. This is true at least for search goods and experience goods. By definition, consumers of these types of goods will at some point discover the true quality of the goods.

The problem with credence goods, of course, is that consumers have no way to gauge quality or their need for the product (as is the case with salvation). By

¹² The seven sacraments of the Roman Catholic Church are baptism, Eucharist, penance, confirmation, matrimony, holy orders, and anointing of the sick.

¹³ Overtreatment and overcharging may be eliminated as well. See Darby and Karni (1973) for further information on the effects of warranties.

¹⁴ Hyundai is a case in point. The quality of its vehicles has improved markedly since they were first introduced to the U.S. market in 1986. So too has its warranty. Hyundai is known to have one of the best warranties currently available. At the time this article was written, it was offering a ten-year/100,000-mile powertrain limited warranty and exceeded most manufacturers in this and all other warranty categories, in terms of either years or miles covered.

obliging followers to interact repeatedly with the Church through sacraments, Catholicism has successfully established a reputation that is based not necessarily on quality, but on familiarity. In fact, this is not unlike the perceived added value that consumers may associate with brand names in the case of many products.

Homogeneity

For simplicity, most investigations into credence good markets assume that consumers are homogeneous. Heterogeneity introduces issues of price discrimination and inefficient product rationing. Studies that do account for heterogeneity have focused primarily on differences in consumer expectations of the value or cost of a successful treatment. According to Dulleck and Kerschbamer (2006), the former may yield undertreatment, whereas the latter may give rise to overtreatment.

In light of the ample evidence of price discrimination exercised by the medieval Catholic Church, we might assume that Catholic consumers at the time were heterogeneous. The sale of indulgences based on consumer income bears this out. However, it is possible that Catholics as a group have become more homogeneous over time. Ekelund, Hébert, and Tollison (2006) claim that the initial appeal of Protestantism can be attributed in part to a lower cost of participation. Presumably, consumers with a lower expected cost would have switched during the Reformation. The implication is that as costs continue to change, movement among alternative paths to salvation will continue to affect the makeup of religious consumers.¹⁵ What is clear is that more work must be done in this area before we can apply the theory further.

Minor Versus Major Treatments in Religion

In the literature on credence goods, fraudulent behavior is often defined in terms of minor versus major treatments. Frequently cited is the example of an oil change versus an engine replacement. Table 1 depicts the different types of fraud in terms of minor versus major treatments as follows: A consumer is *overtreated* if the engine is replaced when the consumer needs only an oil change, *undertreated* if the consumer receives an oil change in lieu of an engine replacement, and *overcharged* if the consumer receives a necessary oil change but pays for an engine replacement.

¹⁵ Iannaccone also describes cost as a major factor affecting consumer choice in religion. The topic is a recurring theme in his studies (1994, 1995).

Table 1: Types of Fraud Depicted in Terms of Minor Versus Major Treatments

	Diagnosis	Treatment	Pays for
Overtreatment	OC	ER	ER
Undertreatment	ER	OC	OC
Overcharging	OC	OC	ER

OC = oil change (minor treatment). ER = engine replacement (major treatment). “Diagnosis” refers to the true diagnosis (unknown to the consumer). “Treatment” refers to the actual treatment received by the consumer. “Pays for” refers to the treatment paid for by the consumer.

Although the distinction between minor and major treatments is relatively clear in markets for repair or medical services (e.g., a tooth cleaning versus a root canal), it is not so straightforward in the market for religion. Dulleck and Kerschbamer (2006) claim that minor versus major treatments can also be expressed in terms of the quality of advice given by the expert. This alternative interpretation is perhaps better suited to the religious product, since the Church in effect is advising its followers by establishing a path to salvation. There is one problem: Whereas minor treatments (such as an oil change) are sometimes acceptable in traditional credence good markets, inferior advice is unlikely ever to be adequate. We might instead consider the sacraments to be minor treatments in religion. They are the standard form of the product issued by the Church and are promoted as the basic set of requirements to attain salvation. However, this implies that services performed beyond the basic sacraments should be considered major treatments.

THE IMPORTANCE OF SELLER REPUTATION

There is an element of trust—or perhaps faith—in any credence good market, a point at which a potential customer must decide whether to take the advice of the expert seller. But what makes this seller an expert in the eyes of consumers? Certainly, consumers of religion must in some way be convinced of the seller’s expertise, that is, that the Church indeed holds the keys to the Kingdom. The successful sale of a pathway to salvation consequently relies on the seller’s credibility. As we shall see, credibility in the religious marketplace does not require the seller to have experience in the consumption of the good. Rather, it may be based purely on reputation.¹⁶

¹⁶ Christianity may in fact offer experiential proof of the existence of salvation. With this in mind, it is interesting that the Apostles were given an opportunity to witness Jesus Christ after the Resurrection. Other religions, such as those that believe in reincarnation, offer similar proof.

Establishing a Reputation in Religion

But in what manner is a religious supplier able to establish a reputation such that individuals are willing to believe in an afterlife? The answer involves both the consumer and the producer. As with any product, the success of a religious product depends on the fulfillment of an underlying need or want. Ekelund, Hébert, and Tollison (2006) claim that the demand for religion is inherently a manifestation of the need to overcome one's existential dread and likely will exist for as long as this need persists among humans.¹⁷ Thus the more that consumers want to believe that some sort of relief from dread (i.e., salvation) is possible, the more likely they are to communicate these desires to potential sellers.

Although unmet needs or desires may lure suppliers to the marketplace, repeat business is not guaranteed. This is true whether the market is monopolistic or competitive. (See Appendix A for further details on reputation in a monopoly setting.) This is particularly true in credence good and experience good markets, in which consumers cannot judge a product's quality before purchase and therefore are often wary of seller intentions. Nevertheless, sellers may earn consumer trust by building a reputation. In keeping with the findings of Huck, Lünser, and Tyran (2007), reputation building reduces the incentive for sellers to exploit consumers.

But reputations typically rely on consumers having some information about a product's quality. With regard to experience goods, this information is gathered only after consumption, either from one's own experience or from public accounts based on the experiences of others. In their analysis of reputation building in experience good markets, Huck, Lünser, and Tyran (2007) distinguish between private information and public information. They assert that this information produces a seller history that serves as an indicator of future trustworthiness.

Although sellers of experience goods can establish reputations based directly on quality, credence good suppliers cannot. Because consumers are unable to determine the quality of a credence good at any point, it is impossible for a seller to establish a similar history. At first glance, this implies that reputation building is impractical in credence good markets. However, Huck, Lünser, and Tyran (2007) posit that as long as sellers are identifiable, reputation building is possible. Fortunately, brand names offer such recognition.¹⁸

¹⁷ A colleague has since put a slightly more positive spin on the idea by pointing out that the demand for religion could also be thought of as the demand for relief.

¹⁸ Take, for example, the case of Coke versus Pepsi. Both are considered experience goods because consumers believe that their quality can be determined by taste. However, a blind taste test conducted by the Brown Human Neuroimaging Laboratory at Baylor College showed that subjects had no preference between the colas (see Connor 2004). In contrast, when presented with brand information, a majority of the subjects preferred Coke. Researchers concluded that a well-known label can alter consumers' perception of a product's taste. There is no reason to think that the effects of brand-name recognition would be any less powerful in a credence good market.

If it is assumed that neither the buyer nor the seller can measure the true quality of a product, a brand name can evoke a sense of uniqueness. This is often accomplished through advertising, which creates a perception of quality. Furthermore, the more advertising there is for a product, the greater is the expense and the greater is the product's apparent value to potential customers. Likewise, the probability that customers will come into contact with the brand is increased.

This relationship is rooted in the theoretical analysis of Klein and Leffler (1981). When repeated purchases are a relevant concern for suppliers and consumers have difficulty determining a product's quality prepurchase, rational consumers require a quality-assuring price—inclusive of a premium—or will not purchase the good.

There are two ways to consider repeat purchases with regard to religion and the product of eternal salvation. First, repeat purchases are possible within a family. For example, sociologist Rodney Stark (1996) attributes the rise of Christianity in large part to social networking; women attracted to the religion would convert their husbands, and children were likely to follow. Next, the Church, acting as a guide, offers a path to salvation, which requires that followers fulfill certain rites (sacraments) throughout their lives. Consumers can therefore choose the extent to which they will buy into the product. In other words, each time a person attends church may be considered a repeat purchase.

Klein and Leffler's (1981) price premium reflects compensation for the supplier's investment in firm-specific capital such as brand-name assets or non-salvageable productive assets or in advertising. Cathedrals are an ideal example of the use of firm-specific capital (reflecting heavy sunk costs, that is, costs that have been incurred and cannot be recovered) as well as advertising for the Catholic Church.

The difference is that Klein and Leffler (1981) appear to focus on experience goods, since consumers are aware of and can inform others about product quality after purchase. Consequently, consumers can reward or punish the seller by deciding whether to purchase in the future. That this public information is unavailable for credence goods means that religious consumers must rely more heavily on the seller's reputation. A brand name therefore helps sellers of credence goods to establish a reputation based on perceived (rather than actual) quality.¹⁹

The Church as an Expert Seller

The religious marketplace offers a unique opportunity to analyze the effects of branding on the reputation of a credence good provider. Although eternal

¹⁹ This may be considered similar to product differentiation in a monopolistically competitive market, in which product differences are for the most part figments of consumers' imaginations, as well as the extent to which sellers advertise to enhance those perceived differences.

salvation is the key product in the market for religion, its true quality is unknown because people are unable to experience salvation in the secular realm. In this regard, it is a credence good. Moreover, we are incapable of gathering information about its quality from those who have passed on to “the other side” and perhaps have attained salvation. Therefore we cannot rely on either our own or others’ experiences. However, the limitations associated with selling a credence good have not inhibited religious firms from establishing brand names.

In particular, the Roman Catholic brand name is well known and has survived for centuries. During the Middle Ages, the Church’s brand dominated the market for religion in the West.²⁰ The Church attained this status largely by offering signals of product quality, in other words, evidence to support the possible existence of salvation.

Cathedrals undoubtedly played a significant role in advertising by offering a preview of heaven. In fact, it is easy to comprehend how cathedrals could be construed as the physical manifestation of the glory of God. The greatest number of Roman Catholic cathedrals were constructed during the medieval period. They towered over most surrounding structures, reaching intentionally toward heaven, while their incredibly ornate interiors displayed wealth that was far beyond the reach of the ordinary public. Moreover, cathedrals required enormous investments in capital, both physical and financial, as well as labor and could take hundreds of years to build. Cathedrals are a perfect example of a sunk cost (Ekelund, Hébert, and Tollison 2006). The use of cathedrals as trademarks in advertising for the Catholic Church further rationalizes the apparent inconsistency between such grand displays of wealth and Jesus’ message of humility as expressed in the New Testament.²¹ Given that the majority of the general public during the Middle Ages was poor, it is doubtful that the use of more modest structures as places of worship would have evoked the same degree of curiosity or interest.²² Thus to potential customers, cathedrals must have provided an otherworldly experience and a strong sense of the afterlife.

Cathedrals may have captured the attention of local populations during the Middle Ages, but for people in more remote areas, news of miracles would have served a similar purpose. The two are also complementary. Many cathedrals

²⁰ According to Terkun (2010), this may be due in part to the exclusive partnership between the Church and secular leaders, which granted the Roman Catholic Church monopoly status in the religious marketplace. However, monopoly status in no way guarantees success in a credence good market. The seller of a credence good must strive to gain consumers’ trust, regardless of market structure, since information concerning product quality is lacking (see Appendix A).

²¹ According to Mark 10:24–25, Jesus says, “It is easier for a camel to go through the eye of a needle than for a rich man to enter the kingdom of God.”

²² Note also that cathedrals, like churches, are considered to be houses of God and accessible to everyone. This would have been appealing to people hoping for a glimpse of heaven and an escape from the hardships of everyday life.

contain relics related to miracles, which encourage pilgrimages to the cathedral sites. If we think of a miracle as something extraordinary, then explaining its cause is difficult by definition; therefore one might conclude that someone (or something) supernatural is responsible for these phenomena. Religions frequently attribute such events to divine intervention. Mysterious healings—following visions of saints or prayers to saints—have been well documented by the Catholic Church. Furthermore, miracles are not only extraordinary but also extremely positive occurrences.²³ Naturally, one would hope that more miracles are possible, further fueling the belief in a higher power. As long as individuals believe that there is a divine being with powers far beyond their own, eternal salvation seems plausible.

According to Stark (1996), potential customers may also gauge the value of eternal salvation by observing the investments of existing devotees. These include the present costs of self-sacrifice and stigma. Self-sacrifice can range from attending services, fasting, and making charitable offerings (consisting largely of donations in the Catholic Church and, later, “works” emphasized by Protestants) to more austere forms of sacrifice and stigma such as vows of celibacy, poverty, and silence (most commonly on the part of clergy members) and even martyrdom. Although followers can find utility in the acts themselves, the related costs are far more apparent to the casual observer. These costs then signal to others the value of their beliefs.²⁴

By creating a brand name that was based primarily on miracles, sunk investments, and self-sacrifice, the Church established a reputation that was attractive to consumers. Consequently, the credibility of the Roman Catholic Church can be attributed to its ability to signal to potential customers the value of its product in lieu of an adequate measure of quality.

THE CHURCH VERSUS GALILEO

In hindsight, perhaps one of the most embarrassing events in the history of the Catholic Church (and the history of scientific discovery) was the condemnation of Galileo Galilei as a heretic in 1633, referred to by the Roman Catholic Church as the “Galileo affair” or the “Galileo controversy.” Galileo’s heliocentric interpretation of Catholic scripture did not mesh well with the Church’s geocentric beliefs. Fast-forward nearly four hundred years, and we learn that the Church has recently hosted a conference to explore the possibility of life on other planets. What could

²³ A recent case involves a French nun who claims that she was healed of Parkinson’s disease after praying to Pope John Paul II. The pope was consequently beatified.

²⁴ No act can demonstrate greater value than martyrdom, since it is certainly the most costly and therefore ultimate attestation of one’s belief. See Iannaccone (2006) for further details on the “market for martyrs.”

have led to such a turnabout? More compellingly, what may be in store for the future Catholic Church and its relationship with science?

I will argue that the steps that the Church took in opposition to science during the late Renaissance—namely, steps to extinguish alternative interpretations of scripture²⁵—were rational, short-run attempts to salvage the Church's reputation as a credence good provider, given increasing competition from Protestantism, but that they harmed the Church's reputation over the long run.

Bad Reputation

The Church's past actions have no doubt left a blemish on its reputation and continue to weigh heavily on the Church. That Pope John Paul II (1992) found it necessary to offer a public apology for Galileo's condemnation (or rather, in the Pope's words, "tragic mutual incomprehension") illustrates this point (Catholic News Agency 2009).

According to Liu (2011), it is a commonly held belief that concern for one's reputation over the long run can discipline current behavior. However, one of the greatest challenges for firms is the alignment of short-term objectives with long-term goals. From the perspective of a profit-maximizing institution, a simple examination of basic, U-shaped average cost curves demonstrates that short-run and long-run profit maximization coincide only at a particular level of the fixed input. Even when the incentive to establish a good reputation exists, the means by which the reputation is realized may instead yield the opposite result.

Ely and Välimäki (2003) examine the effects of reputation in a credence good market. They claim that efforts to boost reputation in the short run may be detrimental to an agent's (i.e., expert seller) reputation in the long run. Their scenario is based on a competitive market consisting of good and bad agents. For instance, from a consumer's standpoint, a bad mechanic will tend to overtreat by engaging in unnecessary serious rather than minor repairs, whereas a good mechanic will repair honestly. They offer as an example an engine replacement versus a tune-up.

With this in mind, a good mechanic who is faced with a high frequency of serious repairs—and who wants to distinguish himself or herself from the bad mechanic—may occasionally make a minor repair when a serious one is needed. In an effort to appear more honest, the good mechanic thus jeopardizes his or her reputation. Consequently, consumers might no longer want to participate, and the market potentially breaks down. The moral is that even a good agent can get a bad reputation.²⁶

²⁵ This includes not only the condemnation of Galileo as a heretic but also related events such as the execution of the Dominican friar-scientist Giordano Bruno, who was also an advocate of Copernicus' heliocentric system.

²⁶ An interesting follow-up question is whether the good agent can still be considered good.

Although I am not convinced that mechanics in practice would respond to one another as Ely and Välimäki (2003) have described, I agree that efforts to attain a good reputation may have unexpected, negative consequences. Moreover, the concept is applicable to the Roman Catholic Church.

In Defense of the Church

As I noted earlier, discrediting Galileo was both strategic and necessary in the short term to protect the Church's position as a credence good provider over the longer run. A brief examination of the history of the Roman Catholic Church bears this out.

After the fall of Rome in 476, the Catholic Church was the sole institution that was capable of protecting intellectual property in the West, and in 1054, the Church further consolidated its power by separating from the larger Christian cooperative, which was based at the time in Constantinople (Terkun 2010). As a consequence of these events, the Church secured its status as a monopoly supplier of religion and disseminator of information in the West. The merging of monopoly power in these areas of religion and information further helped to pave the way for the concept of infallibility. Broadly speaking, infallibility maintains that the Church is the exclusive interpreter of scripture. In its earliest form, this meant that pronouncements regarding scripture were made by ecumenical councils and did not equate to bishops being individually infallible. In the aftermath of the Eastern Schism of 1054, the practice took on a new dimension with the inclusion of papal infallibility.²⁷ Being a singular bishop with infallible powers must have yielded an impressive level of authority for the Roman Pontiff, raising credibility and thus reinforcing the Church's reputation as a credence good supplier.

Theoretically, because the Church controlled the dissemination of information, it could also control the quality of its image or reputation. Recall that the ability to successfully market a credence good depends entirely on the reputation of the seller, since the consumer cannot determine the true quality of the good. Any challenge to the status quo therefore could be very damaging to the reputation of the Church and its ability to sell its product.

For this reason, in the centuries before the Galileo affair, the Church worked diligently to eliminate numerous threats, both from within Christianity and from rivals in the market for religion. This is evident in the Crusades as well as the suppression of the Waldensian and Albigensian heresies. Appendix B summarizes these and other significant historical events that led up to the Galileo affair. Overall, it would have been impossible for the Church to incorporate any of these

²⁷ Although not officially defined as doctrine until the 19th century, the tradition of papal infallibility dates back at least to Pope Gregory VII in the 11th century.

alternative views, primarily because of its established role as the sole interpreter of scripture.

Despite these earlier trials, the Reformation and subsequent rising tide of Protestantism must have stunned the Church. Although many new ideas burst forth with the Reformation, the most relevant to this article is the notion that middlemen were unnecessary for personal worship. When coupled with new technologies that allowed for greater individual access to the Bible, such as Gutenberg's printing press, it would have been only a matter of time before someone challenged the Church's claim of infallibility.

Ironically, the Church's most formidable challenger did not hail from the Protestant ranks. Certainly, by setting in motion the Reformation, Luther as well as Calvin, Zwingli, and Knox were in their own right formidable challengers as well as clergymen. However, it was Galileo's observations in opposition to geocentricity in combination with his high-ranking academic status and reputation as a Catholic that arguably caused the greatest damage to the Church.

Implications of the Galileo Affair

The Roman Catholic Church had gone to great lengths to assert its authority as the exclusive interpreter of scripture in the West. Moreover, as the protector and disseminator of new ideas, the Church had assumed the responsibility of shaping the worldview of its followers. Unforeseen, however, was the entirely new outlook that Galileo would bring to the Church.

Galileo was very much a product of the Renaissance. He had a thorough knowledge of mathematics, physics, and astronomy, and taught in these areas. Moreover, he was one of a growing class of scientists affiliated with the Church, including Copernicus, Bruno, and Clavius, all of whom were involved in efforts to reform the calendar to better reflect Church holidays and feasting or fasting periods. Although Galileo, unlike those contemporaries, was not a cleric, by all accounts he considered himself a pious Catholic (see Galilei 1957).

Today, Galileo is frequently praised as the father of modern science,²⁸ but it is not surprising that his findings originally met great resistance from the Church. According to the Church, Galileo's discoveries conflicted greatly with the existing doctrine. Using a new, more powerful telescope that he had constructed, which was capable of magnification up to ten times that of the human eye, Galileo shed light on the imperfections in God's universe, exposed objects that had heretofore been unaccounted for, and, above all, provided the empirical evidence that was needed to confirm Copernicus' model of heliocentrism.

²⁸ A title that was reportedly bestowed upon him by Einstein.

Galileo's discoveries include but are not limited to detecting sunspots and irregularities in the earth's moon, discovering the "Medician Stars" (known today as the Galilean moons of Jupiter), and documenting the different phases of Venus. This last observation, which directly contradicted the geocentric view that was supported by the Church (and dated back to Ptolemy in first century), can be summarized as follows: If the earth were in the center of our planetary system, the gibbous and full phases of Venus would indicate that it is located on the far side of the sun rather than between the earth and the sun, as demonstrated by its crescent and new phases. Galileo noted that Venus displays all four phases, which is possible only in a heliocentric system.

Interestingly, attempts were made to incorporate Galileo's findings, suggesting that his observations could not entirely be discounted. For instance, the Tychonic system—developed in the late 16th century by a Lutheran and favored by the Church—proposed a middle ground between the heliocentric and geocentric models. It integrated Galileo's and Copernicus' claims that Venus as well as other planets orbit the sun but still posited that the sun orbits the earth.

The theory of heliocentricity predated Galileo and was known to the Church. However, Galileo was the first to attempt to rationalize the Bible with his own discoveries.²⁹ The original model developed by Copernicus was primarily mathematical and lacked the empirical backing that Galileo provided through his telescopic observations. Furthermore, although Copernicus was a canon, he does not appear to have pressed the Church to incorporate his findings. In contrast, Galileo called into question the scriptural interpretations of the Church. In his defense, in his 1615 *Letter to Madame Christina of Lorraine, Grand Duchess of Tuscany: Concerning the Use of Biblical Quotations in Matters of Science*, Galileo quotes St. Augustine (415 C.E.):

Now keeping always our respect for moderation in grave piety, we ought not to believe anything inadvisedly on a dubious point, lest in favor to our error we conceive a prejudice against something that truth hereafter may reveal to be not contrary in any way to the sacred books of either the Old or the New Testament (Galilei 1957: 175).

This called into question not only the concept of infallibility and the authority of the Church, but also the reputation that the Church had long struggled to build as the one true supplier of a path to salvation.

²⁹ Of course, Galileo was not the last. Charles Darwin faced a similar conundrum with his theory of evolution. By all accounts, Darwin was a religious individual and sought to rationalize his beliefs with science.

The papacy, which had to protect its position as an expert seller in the credence good market for religion,³⁰ responded by making an example of Galileo. He first met with the Inquisition in 1615, at which time he was warned to abandon his support for heliocentrism because it was incompatible with scripture, to which he reportedly agreed. However, after publication in 1632 of his most famous work, *A Dialogue Concerning the Two Chief World Systems*, Galileo was promptly tried as a heretic, forced to recant, and placed under house arrest for the remainder of his days. Even while under house arrest, Galileo continued to publish and reach out to other scientists.

One might wonder why Galileo's punishment was not more severe when other people had been executed for lesser crimes. Furthermore, why was Copernicus, the true originator of heliocentrism, never tried? One reason might be that Copernicus' seminal work on the theory, *De Revolutionibus Orbium Coelestium* ("On the Revolutions of the Heavenly Spheres," a collection of six books), was not published until the year of his death, 1543. In addition, Copernicus' books were "too mathematical" for most people to comprehend, such that only someone "technically proficient in astronomy" could understand them (Kuhn 1969: 123–124).³¹ Moreover, Galileo probably was more widely known and appears to have been well respected. During his lifetime, he chaired the departments of mathematics at two eminent universities (in Padua and Pisa). We may surmise that Galileo's punishment was not more harsh because the Church deemed any additional action against him to be counterproductive to its aims. Perhaps the Church was aware that such a move could fuel greater opposition within (if not beyond) the scientific community in the turbulent era following the Reformation.³²

One of the most interesting statements attributed to Galileo is "*Eppur si muove*," which can be roughly translated as "And yet it moves."³³ Galileo allegedly uttered these words, referring to the movement of the earth, under his breath after he was convicted by the Inquisition. This incident was reported in 1757, over 100 years after Galileo's death, by Giuseppe Baretta, an Italian-born English literary critic. Whether or not the quotation is accurate, it speaks volumes about the attitudes of the day. It conveys Galileo's defiance in the face of the fearsome and powerful Inquisition of the Catholic Church and grants him a "last laugh." In retrospect, it is a sign of the inevitable advancement of science and of the perspective with which society viewed the Galileo affair only a century later.

³⁰ Here, the papacy refers specifically to Pope Urban VIII, who, before ascending to the papal throne, had been a patron of Galileo and supported much of Galileo's work. It is not surprising that his perspective changed once he was at the helm of the Church.

³¹ We can speculate whether this complexity was deliberate. It is at least coincidental.

³² The Church was then embroiled in the Thirty Years' War (1618–1648), which began as a religious conflict between Protestants and Catholics and encompassed much of northern Europe.

³³ I would like to thank my colleague Professor Animesh Ghoshal for bringing this to my attention.

Clearly, the Catholic Church was not prepared for the Galileo affair. His revelations paved the way for an entirely new worldview as well as a new interpretation of scripture. The Church could neither fully censor Galileo's findings (because other people were free to make the same observations) nor support them when it was apparent that they did not derive from Church teachings. Worst of all, this proved a lack of foresight on the part of the authority on salvation.³⁴ The survival of the Catholic Church as an expert seller therefore demanded that the Church reexamine its approach in the market for religion. As a consequence, the Church has since recognized the need to take a proactive role in gaining an informational advantage, particularly in the area of science.

THE CHURCH EMBRACES SCIENCE

Since the Galileo affair, the Roman Catholic Church has radically altered its approach toward science—astronomy in particular. It is possible that the Church is simply mending an old rift. Forgiveness is a key tenet of Christianity, after all. However, I contend that the negative reputational impact of the Galileo affair and the Church's determination to boost its reputation explain this change in attitude.³⁵

Major changes began to appear only two centuries after Galileo's conviction when, according to the Vatican, the papacy established its first observatory, the Observatory of the Roman College (1774–1878), followed by the founding of the Observatory of the Capitol (1827–1870) and the *Specula Vaticana* (1789–1821). Since 1891, the Vatican Observatory has been based in Castel Gandolfo in Italy.

Further advances in space exploration have accelerated the Church's interest in astronomy.³⁶ In the 1980s, the Church established the Vatican Observatory Research Group (VORG), which is according to the Vatican, "one of the world's largest and most modern centers for observational astronomy" (Vatican City State 2012). Located in Tucson, Arizona, in the United States, the VORG works closely with the Steward Observatory at the University of Arizona. In addition, the group publishes a journal dedicated to research related to the work of Galileo and Copernicus. In 2009, in its boldest move yet, the Vatican hosted an astrobiology conference exploring the possibility of life on other planets, perhaps even intelligent

³⁴ The Church's credibility, particularly in terms of papal infallibility, has yet to recover. Sociologist Andrew Greeley provides evidence of a continued struggle and noted in 1990 that only about 25 percent of American Catholics accept papal infallibility.

³⁵ This may also be due to the need for product differentiation. The Catholic Church no longer has a monopoly on the dissemination of information. However, its reputation continues to depend on its knowledge of the divine (i.e., a path to salvation). Because multiple paths now exist, the Church must distinguish itself from other providers in what may now be considered a monopolistically competitive marketplace. However, why the Roman Catholic Church has chosen to specialize particularly in the field of astronomy might be best answered by my explanation.

³⁶ The fact that the average Catholic today is better educated in the sciences may also play a role.

life (David 2009).³⁷ In 2010, astronomers announced the results of observations collected over the last decade: the discovery of Gliese 581 g, an earth-like planet that is theoretically capable of harboring life. In late 2011, NASA confirmed Kepler-22b as a near-earth-size, habitable-zone planet (Johnson 2011). NASA has indicated that there may be as many as ten candidates in total.

Thus the Catholic Church appears to have made a transition from being a censor to once again being a patron of science. Given the Church's role as an expert seller in a credence good market, this is a predictable outcome. Moreover, the change was inevitable. Advances in mass communication have made it increasingly difficult to control the transmission of information; censorship is no longer as simple as banning a book. Therefore new discoveries that might contradict Church teachings would receive wide coverage and call into question the Church's authority.

By positioning itself at the forefront of the astronomical field, the Church has gained the crucial advantage of foresight. Foresight strengthens the idea of infallibility and gives the Church an opportunity to prepare a new interpretation of scientific discoveries that is in line with scripture.³⁸ Obviously, such an advantage was lacking when Copernicus' ideas first took hold.

It is important to recognize that the Galileo affair did not end with his denunciation. Its effects have been long lasting and evidently continue to influence the Vatican's actions. It has taken the Catholic Church hundreds of years to begin to repair the damage to its reputation, and it is clear that the Church does not intend to be caught off guard in the future.

CONCLUSIONS

My objective in this article is to emphasize the importance of seller reputation in a credence market, wherein there exists the potential for fraudulent behavior, by applying credence good theory to the nontraditional market for religion. During the Galileo affair, the Roman Catholic Church assumed the role of an expert seller as a guide to eternal salvation. The Church's actions in the affair illustrate precisely the significance of reputation to the Church and offer an economic explanation for a major event in history.

³⁷ This conference, a Study Week on Astrobiology, held on November 6–10, 2009, in Vatican City, was hosted by the Pontifical Academy of Sciences.

³⁸ Realistically, not all policies advanced by the Church appear to "embrace" science as fully as the term would imply. For example, in a 2008 interview with the Vatican newspaper *L'Osservatore Romano*, Archbishop Girotti warned against genetic manipulation (Gori 2008). The archbishop noted, as the basis for his argument, that its "outcome is difficult to predict and control." As expected, the Church remains cautious in areas in which it has little expertise.

As is implied by the theory, we discover that the Church will respond in cases in which its reputation is threatened. This is a predictable response for a credence good provider, particularly when faced with competition from other expert sellers. In the market for religion, the Catholic Church was only beginning to grasp the competitive effects of the Protestant movement at the time of the Galileo affair. Having directly challenged the unique authority of the Church to interpret Scripture, Galileo was promptly discredited. But as Ely and Välimäki (2003) point out, efforts to preserve or improve one's reputation can backfire, resulting in a bad reputation. The Galileo affair offers empirical evidence in support of this hypothesis. Surely the attention that Galileo's observations received even after his condemnation must have weighed heavily on the Church's reputation as the sole authority on scripture. Consequently, the Church reversed its attitude on astronomy. Although this shift is perhaps startling to many people today, it is not so remarkable when it is analyzed within the context of credence good theory. Rather, it demonstrates a conscious effort on the part of the Church to distance itself from its previous actions and to redeem its reputation.

More recently, the Church appears to be taking steps to prevent similar hazards in the future. Such actions suggest that the Roman Catholic Church is truly a dynamic institution and that its ability to adapt has been its greatest source of longevity.³⁹ Its ardent involvement in issues at the forefront of the astronomical field demonstrates that the Church has learned the value of foresight as a credence good provider and wants to be better prepared to carry out its role as an interpreter of scripture. From a strategic perspective, we might infer from this that the Church is buying time to prepare its response as new information is released. At the least, the Church stands to gain a considerable informational advantage. This is perhaps the greatest lesson that the Church has learned from the Galileo affair.

Of course, numerous factors beyond those discussed here may affect an expert seller's reputation. The recent pedophilia scandals within the Catholic Church are a case in point. When we consider this in combination with the Church's advances in astronomy, it is certainly possible that the net reputational effect is negative. For example, after evidence of sexual abuse of children by Catholic priests was uncovered in the United States in 2002, a Gallup survey found that the percentage of American Catholics "rating the honesty and ethics of clergy as high" had dropped by 14 points—from 64 percent to 50 percent—when compared with the results from the same survey conducted five years earlier (Jones 2002). This decline in ratings was steeper than that among Protestant respondents or overall respondents. Jones notes that in the early 1990s, after similar revelations of sexual abuse by Catholic priests, the overall ratings of the ethics and honesty of clergy

³⁹The extensive use of doctrinal innovations since the Middle Ages further supports this claim.

also showed a downward trend.⁴⁰ As agents of their denominations, clergy directly represent the denomination in their interactions with other members. Therefore the behavior of Catholic priests and the extent to which Church members view this behavior to be honest or ethical may be said to affect the reputation of the Church. The Gallup survey results suggest that among American Catholics, the reputation of the Church has suffered from the sexual abuse scandals. Reputation depends on the sum total of a credence good provider's actions, and until the Church adequately addresses the issue of pedophilia in the eyes of the public, its positive efforts in other areas might be in vain.

In conclusion, the importance of reputation to a credence good provider cannot be overstated. Although the Galileo affair remains a sensitive issue for the Church, discrediting Galileo was a strategic and necessary short-term step to protect the Church's position as the long-term provider of a credence good. Recognition of this fact allows us to reconcile the condemnation of Galileo with the Church's subsequent leap into space exploration. Ultimately, they are elements of the same strategy: to ensure the survival of the Roman Catholic Church in a credence good market.

AVENUES FOR FURTHER RESEARCH

Further study on the Catholic Church as a credence good provider is warranted. The existing literature on credence goods focuses primarily on either monopolistic or competitive expert seller markets. Additional analysis of the evolution of the Roman Catholic Church, which began as a monopoly and eventually faced competition after the Protestant Reformation, may provide insight into how credence good providers adapt as industry structure changes. This might also explain changes in pricing policies, including the shift from explicit prices in the Middle Ages to primarily donations today. My suspicion is that donations reduce, if not eliminate, fraudulent behaviors such as overcharging and overtreatment, which are key problems in credence good markets. This might be a fruitful area of research.

Ideally, it would be beneficial to identify more concrete examples of the different types of fraud in religion, including overtreatment, undertreatment, and overcharging. That religion produces a joint product makes this task difficult. For example, are we referring to the product of salvation, as promulgated by the institutional Church, or to the numerous services provided by priests? The latter appear more prone to the various categories of fraud. If efforts to identify fraud are successful, it may be possible for religious organizations to develop policy prescriptions to minimize these problems and to draw more customers (or win

⁴⁰ Separate Catholic and Protestant ratings are not shown for the 1990s.

them back, as the case may be). New strategies are certainly needed, as recent surveys have shown an increasing movement away from organized religions.⁴¹

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⁴¹ The findings of a study conducted in 2008 by the Pew Forum on Religion and Public Life suggest that defection is not caused by rivalry within the religious marketplace but rather is a consequence of the organizational structures themselves (AP News 2008).

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Appendix A: Reputation in a Monopoly Setting

If we consider reputation to be a tool that firms use to distinguish themselves from their competitors, then a monopolist, owing simply to its market structure, would appear to have no need for reputation. The firm earns economic rent regardless.

Why then was the monopolistic medieval Catholic Church keen on establishing a reputation? Perhaps the Church wanted to stimulate further demand for its product or to encourage repeat business. Either would be a sufficient motive. Inducing demand was certainly important to the Christian Church in its early growth phase. However, by the time of the Eastern Schism in 1054, the Roman Catholic franchise had already matured.⁴² It extended fully across Western Europe and, until the discovery of the Americas, was geographically constrained. Therefore further demand from new consumers was not an option.

The more likely incentive then is the desire for repeat business. In credence good markets as well as experience good markets, consumers are unable, at least initially, to judge the quality of a good and have no basis on which to trust the seller. Consequently, firms opt for the simplest way to minimize cost, and consumers are frequently undertreated. In markets for experience goods, competition may eliminate this problem. Consumers will sample the good (i.e., identify its quality) and move to competing sellers if dissatisfied.

Where firms are concerned with repeat business, reputation pays by establishing trust with the consumer and hence consistency in demand. This is true whether or not competition exists. Therefore it makes sense that a monopolist—even in a credence good market—would be interested in reputation building. A reputation essentially serves the same purpose as liability. By removing the incentive to undertreat, a reputation helps to mitigate consumer uncertainty.

⁴² In prior work, I introduced the idea of a life cycle of the Church based on its different phases of growth (Terkun 2010).

Appendix B: Significant Events Leading Up to the Galileo Affair

Dates are from the *Encyclopaedia Britannica Online*, <http://www.britannica.com> (accessed 31 December 2011).

1. Suppression of external threats
 - 1095: The First Crusade
2. Purging of rivals from the religious marketplace
 - c. 1184: Pope Lucius III bans the Waldensian movement.
 - 1209–1229: Pope Innocent III calls for the Albigensian Crusade to suppress the Cathari movement.
 - c. 1230: Pope Gregory IX establishes the Papal Inquisition.
 - 1478: Pope Sixtus IV establishes the Spanish Inquisition.
3. Rising Protestant movement
 - c. 1517: Beginning of the Reformation
 - 1542: Pope Paul III establishes the Roman Inquisition to serve the Papal States.
 - 1618–1648: The Thirty Years' War between Protestants and Catholics
 - 1633: The Roman Inquisition under Pope Urban VIII condemns Galileo as a heretic.