

Having Life More Abundantly: Caring for the Body, Mind, and Spirit

Thomas D. Jeitschko

Michigan State University and University of London

Séamus O’Connell

National University of Ireland

Rowena A. Pecchenino

National University of Ireland

Abstract: *Health can be subdivided into three categories: physical, mental, and spiritual. Empirical work establishes spiritual health as a correlate of physical and mental health. The purpose of this paper is to complement these empirical findings with choice-theoretic underpinnings. Thus, to trace the linkages between one’s choices concerning the disposition of one’s income and time and one’s health and well-being, we develop a model comparing differentially spiritual individuals. While subjective well-being is increasing in spirituality, the more spiritual may not be healthier. Those whose faith provides superior ability to cope with stress have better health and subjective well-being. Public policy can provide incentives to reduce the costs of spiritual development, perhaps leading to a healthier populace. JEL: I190, D01, Z12. Key words: spirituality, spiritual capital, sense of coherence, health and well-being, socially referenced preferences, altruism.*

An individual’s health can be subdivided into three categories:
Physical health – well-being of the body
Mental health – cognitive and emotional well-being
Spiritual health – well-being of the spirit.

The first type of health is overseen by the medical practitioner, the internist, the oncologist, the osteopath, the chiropractor, whose concern is with the efficient functioning of the body. The second type of health is overseen by the mental health practitioner, the social worker, the psychiatrist, the psychologist, whose concern is with one’s cognition, of the balance of emotions, of one’s ability to cope with temporal realities. The last type of health is overseen by the priest, the rabbi, the lama, the minister, the imam, the healer, whose concern is with one’s spirituality,

Authors’ Note: *We would like to thank Enda McDonagh, David Madden, Daniel Finn, Finbarr Bradley, Ayman Reda, John Goddeeris, and the seminar participants at the University of Nottingham, Drexel University, Michigan State University, and the 2005 Irish Economic Association Meetings for their comments. All errors are ours alone. email for correspondence: jeitschk@msu.edu; seamus.g.oconnell@may.ie; rowena.pecchenino@nuim.ie.*

2 FAITH & ECONOMICS

with one's relationship with the transcendent, with God, and with one's fellow man.

For the most part, these categories of health are treated as largely separate and distinct. The subdivision of health, while somewhat arbitrary, can be traced to the different perspectives from which health practitioners attempt to heal their patients. The medical doctor looks for a physical cause for poor physical health, perhaps ignoring or feeling ill-equipped to identify psychological or spiritual causes. The psychologist looks for a psychological cause for poor mental health, perhaps ignoring or de-emphasizing potential physical or spiritual causes. The priest looks for a spiritual cause for poor spiritual health, perhaps failing to recognize the physical or psychological sources of distress. Only a holistic approach to health merges all three components and calls upon physical, mental, and spiritual specialists to jointly diagnose and heal the patient. Attempts have been made by the medical profession to do this by bringing the spiritual to bear on the physical and mental: courses on religion, spirituality, and medicine are common in U.S. medical schools (Koenig, McCullough, & Larson, 2001), and pastoral care is provided in many hospitals (Driscoll, 2003). Yet health policy and health insurance have largely eschewed the connections. Mental health coverage is often severely restricted—e.g., the number of covered visits is restricted in ways that physical health coverage is not. And little provision is made for the spirit. Yet—as is amply documented in the existing empirical literature (see section 1)—it is the health of the spirit that has repeatedly been shown to be an important correlate, if not determinant, of the health of the body and the mind. Despite the interest in this connection and the extensive empirical research establishing these connections between health and spirituality, there are few economic analyses and no choice-theoretic examinations of this connection. The purpose of this paper is to begin to fill this gap in order to obtain a conceptual framework in which to consider possible implications of public policy on spirituality and public health.

To trace the linkages between one's choices and one's health and well-being, *the abundance of one's life* (John 10:10), we propose a choice theoretic model that takes the complexities and competing demands of modern life seriously: cultural and sociological demands on one's time and one's income, such as those implicit in meeting a social norm, compete with one's desire for health and well-being. Individuals divide their time among work, leisure, exercise and other healthy activities, and spiritual pursuits. They divide their income among consumption goods, physical and mental health care, donations to support their religious/spiritual community and

its causes, and purchases of goods and services that deepen their spiritual lives.

When deciding how to allocate his time, the individual must recognize that time spent in one way may affect the benefit of spending time in other ways. For example, time spent at work may be stressful, thereby reducing the effectiveness of exercise and other healthy activities, or it may entail health maintaining exercise, reducing the need to devote additional time to health. Time spent in spiritual pursuits—attendance at religious services, in prayer, in meditation—may also have salutary or, perhaps, pathological effects, again reducing, or increasing, the need to spend time in health enhancing activities rather than at leisure.

When allocating one's income, the more goods one consumes the less income that remains to purchase physical and mental health enhancing medical care or to make spiritual health enhancing (altruistic) donations to one's religious/spiritual community. The benefit of such expenditures depends not on the level of spending, but the level relative to one's income—the poor may be more generous than the rich, and thus may reap larger spiritual rewards. But, the benefit of consuming goods may be affected by sociological or cultural imperatives (keeping up with the Joneses) or by psychological factors as a result of stress: comfort food (Dallman et al., 2003) or retail therapy (Black, 2001; Dittmar, 2005).

While spiritual pursuits may affect one's physical and mental health, individuals also invest directly in their spiritual well-being. Individuals differ in their ability or self-assessed need to achieve spiritual well-being as a result of extrinsic and intrinsic differences in their spirituality, and their place in their spiritual community. The relationship itself may exhibit increasing, constant, or decreasing returns. However, one's spirituality must vie with the mundane. To spend more time in meditation or prayer, for example, one gives up time spent at leisure or in physical and mental health enhancing activities. One therefore compares marginal benefits across alternative uses of one's time. That is, one must balance the competing demands of body, mind, and soul given one's limited resources. In this paper we explore just how one does this given the internal and external forces at work.

The paper proceeds as follows. Section 1 contains a somewhat eclectic literature review. Its purpose is to show the breadth of research on the links between spirituality and health. In section 2 the model is presented. The main results are derived and discussed in section 3. In section 4 we examine whether there is a role for public policy in promoting the link between spiritual health and physical/mental health. Section 5 concludes.

4 FAITH & ECONOMICS

1 Review of the Literature

Since the seminal early work by Grossman (Grossman, 1972a; 1972b; 2000) there is a large and rapidly growing literature in economics that addresses the determinants of healthy lives. Economists have also examined the economic effects of religion and religious observance (see, e.g., the extensive survey by Iannaccone, 1998). However, there is little in the economics literature to date that addresses the connections between religion or spirituality and health.¹ This is particularly surprising since health economists have in fact extensively examined the connections between health, on the one hand, and, for example, income, education, occupation, age, sex, marital status, or ethnicity, on the other. Indeed, empirical research has progressed quite far in addressing these connections, to such a degree that specific quantifiable policy prescriptions can be suggested (see, e.g., Fuchs, 2004).

In contrast to economic research, many other disciplines, among them medicine, psychology, sociology, and religious studies, have examined the relationship between spirituality or religiosity and physical and mental health. The most comprehensive review of the literature on religion and both physical and mental health is found in Koenig et al. (2001) in which over 1,600 studies are systematically reviewed. An historical time line relating religion, science, and medicine is provided which is followed by a brief history of thought on the salutary and deleterious effects of religion on health. Thereafter the literature is reviewed. The 1,600 studies in their sample examine the relationship between religion and physical health (both generally and specifically), between religion and mental health, between religion and the use of healthcare, and between religion and the provision of healthcare. They conclude that, while the studies reviewed vary in rigor and scientific merit, the preponderance of the evidence suggests that faith, somehow defined, is salutary: religiosity, spirituality, pastoral care, etc., lead to better physical and mental health outcomes.

Acclaimed medical sociologist Aaron Antonovsky (1979; 1987) reversed the focus of most medical investigation to determine what makes people well rather than what makes people sick. He links wellness to a *sense of coherence*, “a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (1) the stimuli deriving from one’s internal and external environments in the course of living are structured, predictable, and explicable; (2) the resources are available to one to meet the demands posed by these stimuli; and (3) these demands are challenges, worthy of investment and engagement” (Antonovsky, 1987, p. 19). One’s religious beliefs, spirituality, or faith

may provide this sense of coherence, thereby providing the individual with the means to navigate successfully through life.

Other sociologists and psychologists have looked more directly at the relationship between health or well-being, as externally or subjectively measured, and religion. Meta-analyses, such as Powell, Shahabi, and Thoresen (2003), and reviews of the epidemiological literature, such as Miller and Thoresen (2003), find positive linkages between religious practice and health. Kark et al. (1996) found that Jews living on religious kibbutzim lived longer and were healthier than their secular counterparts. The main difference between these two groups' lives was religious observance.

When subjective well-being is the measure of health, Ellison (1991) finds that strong religious faith leads to higher levels of life satisfaction and happiness, and a greater ability to deal effectively with traumatic life events. Cohen (2002) finds that spirituality is positively related to happiness or life satisfaction. Swinyard, Kau, and Phua (2000) examine whether materialism or religiousness is the better road to happiness, finding for the latter.² Even studies not specifically examining the religion/health linkage report on it. In David Snowdon's epidemiological study of the School Sisters of Notre Dame (2001) which investigated the causes of Alzheimer's disease, he chose to study the members of a religious order because of the similarities of their lives. He asserts, however, that their spirituality improved their health.

The discipline of psychology has been divided about the effects of religion on mental health almost from its inception. Freud (1907) clearly thought religious practice harmful and likened it to obsessive behavior, while Jung (1933) found religious belief to be a key to psychological healing and recovery. Van der Horst (1955) echoes Jung. For him, one cannot hope to improve the mental health of an individual without knowing the state of his soul. Recent work, such as the survey by George, Larson, Koenig, and McCullough (2000) and Hackney and Sanders's (2003) meta-analysis, while being more empirical and less philosophical, tend to favor Jung's view rather than Freud's.³

What almost all of these studies have in common is their empirical nature. They seek a relationship between health or well-being and spirituality or religious faith. Generally one is found and it is positive. Yet, what is missing from this literature is an analysis of the choices individuals make over the disposition of their resources of time and money into spiritual and temporal uses. An hour in prayer or meditation is an hour not spent in health enhancing activities, at leisure, or at work. A dollar donated

6 FAITH & ECONOMICS

to the church, synagogue, or mosque is a dollar not spent on consumption goods or medical care. How these choices are made, the forces that affect these choices, and the trade-offs they entail, are the concerns this paper addresses.

2 The Model

We model the choices of a (possibly spiritual) individual. While there is no universally agreed upon definition of spirituality (Marmion, 1998), we understand spirituality to mean “the experience of consciously striving to integrate one’s life in terms not of isolation and self-absorption but of self-transcendence toward the ultimate value one perceives” (Schneiders, 1986, p. 266). Thus, spirituality is not, specifically, religious in nature. However, since there is a strong connection between religion and spirituality and an empirical connection between religion and health,⁴ we will examine this perspective in some detail. Following the above definition, spirituality for the religious individual is developed and enhanced within a community of which the individual is a member.⁵ For the nonreligious individual spiritual needs may be fulfilled by membership in a civic or social organization or other formal or informal community or group, or the community component of spirituality may be significantly attenuated with spirituality being an essentially private matter.

If the individual is a member of a faith/spiritual community, he pursues his spirituality both alone and in communal, often religious, practice. He contributes to the community in terms of time spent in spiritual pursuits, some of which are community rather than privately focused, and in terms of donations or tithes.⁶ The individual may benefit from membership in the community in terms of a sense of coherence that gives him the means to effectively cope with the complexities of life. This sense of coherence has both internal and external components such that his faith/spiritual perspective provides him a framework within which to understand and successfully navigate his life, and his faith/spiritual community provides implicit and explicit benefits of membership, from a sense of belonging, to presence in prayer inherent in communal religious practice, to pastoral care, to economic support in times of need to assist him.⁷ In this paper we do not model the explicit interaction between the individual and the community. Rather, we suggest where the effects of the community on the individual will be realized in terms of parameter values. In a companion piece (DeLeire, Jeitschko, O’Connell, & Pecchenino, 2007) we model both the community and the individuals that comprise it.

2.1 Agent Utility

Economic thought has traditionally defined an agent's preferences over things that are more or less readily measurable—the consumption of material goods and leisure time. However, as our interest is how one's choices affect one's health and how this interacts with one's spirituality,⁸ we let an individual's well-being be defined by the function

$$(1) \quad U(c, t^\ell, \chi, h).$$

Here U is a conventional utility function whose domain includes material consumption, c , and leisure, t^ℓ , and—in order to address our main concern—an individual's spirituality χ and health h .

One approach to modeling agent behavior and the implications of the trade-offs that agents face in this setting is to consider a general functional form on utility, the determinants of health and the determinants of spirituality, with only assumptions on the signs of first and second derivatives as well as the cross-partial derivatives of interest (and, where needed, assumptions concerning relative magnitudes of these derivatives). However, a difficulty inherent in such a general approach is that it must convincingly capture the complex interaction of the agent's choices concerning the allocation of time and money and how these impact spirituality and health—feeding back into overall utility. While one would hope that such a general approach would yield general insights, a concern is that this approach runs the risk of lending itself to imposing desired insights through what may ultimately be *ad hoc* assumptions of which the plausibility is hard to demonstrate.

In contrast, our approach in this paper is to make use of common functional forms—a standard Stone-Geary type utility function, a standard Cobb-Douglas function for spirituality, and a linear function for the generation of health, all of which we motivate and detail below—and then derive what results flow from these functional forms. This approach makes clear, given the standard modeling assumptions used in economics, what is required in order to establish a direct positive link between spirituality and health (defined narrowly). In contrast, assuming signs on cross-partials allows one to readily establish such connections, although without giving much insight into the explicit tradeoffs between spiritual endeavors and other endeavors that agents make. We believe that, given our explicit approach, it becomes clearer what the connection is between investments of time and effort that could be spent otherwise and the benefits obtained in terms of health, which are otherwise not obvious.

8 FAITH & ECONOMICS

Agent Spirituality: What constitutes spirituality enhancing activities and behaviors? Scripture can provide some direction.^{9,10} For example, Christians are commanded to love God and neighbor (Mark 12:28–31). One loves God through prayers (the Lord’s Prayer is an example), in doing God’s will, in loving one’s neighbor by acts of charity (Luke 10:29–37), and by sharing one’s spiritual and material gifts with one’s community (1 Cor. 12:24b–26). In the setting of this model one’s preference for spirituality is a primitive and thus inherent in the individual—the individual has a preference for a spiritual life (Matt. 5:21–6:1 or 6:6), and takes choices/actions to achieve that outcome. The strength of that preference is reflected in the parameters that determine spirituality, χ , and in some of the other parameters of the utility function, U , which allows us to make comparisons across individuals who are identical up to the centrality/intensity of their faith/spirituality in guiding their lives.

Thus, we assume that spirituality χ is enhanced by time spent in spiritual pursuits t^s and donations or tithes \bar{s} made to one’s faith community. That is, $\chi = \chi(t^s, \bar{s})$, where $\chi_1 \geq 0$, $\chi_2 \geq 0$, $\chi_{12} > 0$. Thus, spirituality is increasing in investments of time and money, perhaps at an increasing rate, or potentially at a decreasing rate. Implicitly, in conventional analysis, spirituality χ is assumed to be a constant with spiritual time subsumed into leisure and spiritual expenditures subsumed into consumption.

The individual components of the model can be understood in the following way. Even when strongly motivated to find spiritual fulfillment, one must nurture one’s spirituality. Living out one’s faith takes both time (in prayer [Matt. 6:5–8; Luke 18: 3–5], in religious observance [Deut. 10:12–22], in charitable activities [Matt. 6:1–4; Luke 10:30–37], etc.), and money (in donations to support the community [Acts 2:44–45], and to support one’s spiritual life [Mark 10:17–22]). How much money depends on what one has (Luke 21:1–4; Lev. 27:30–32), thus the value of one’s donation is taken relative to one’s income, as in the story of the Widow’s mite (Mark 12:43b–44).¹¹ The more one gives and gives altruistically to benefit the community (Col. 3:14)—the common good rather than oneself—the better one’s spiritual well-being, *ceteris paribus*. Thus, the mechanism by which money spent to support one’s spiritual life is money invested in one’s spiritual community. These funds maintain the community, and through collective funding, the community supports the individual’s spiritual development. A similar mechanism is at work with regard to time spent in spiritual pursuits.¹²

To be able to model how individuals with different intrinsic benefits from spirituality (via, for example, their memberships in a spiritual

community) differ in terms of health, it is important to be able to sort individuals along this dimension. Moreover, we wish to capture that neither time nor money alone are adequate to achieve spiritual wellness. Thus, to derive closed form solutions which allow us to trace specific paths by which spirituality can affect health, and thereby provide a theoretical underpinning for various empirical results, we let

$$(2) \quad \chi(t^s, \bar{s}) = (1+t^s)^{g_1} (1+\bar{s})^{g_2}, \quad g_1 \geq 0, \quad g_2 \geq 0,$$

with t^s (time spent in spiritual pursuits) being measured in absolute time, in contrast to \bar{s} (i.e., tithing) which is measured relative to the individual's overall income.

One's ability to transform time and money into spiritual wellness depends on a multitude of intrinsic and extrinsic factors,¹³ parameterized by the exponents g_1 and g_2 , where g_1 may be interpreted as an index of spirituality and g_2 as an index of the importance of community welfare relative to own material well-being, a measure of altruism.^{14,15} Some may see greater, perhaps even increasing, returns to spiritual activities—there is no reason to presume that time or money spent in spiritual activities exhibits decreasing returns at the margin (Putnam, 2000). Yet some may see very little return.¹⁶

Agent Health: Since spiritual wellness is not independent of physical and mental wellness,¹⁷ individuals also attend to their physical and mental health. The individual's physical and mental health is increased by time spent in health enhancing activities (and thus implicitly not in other activities), such as exercise or counseling, denoted by t^h . Second, health increases in expenditures on medical goods m , such as pharmaceuticals, routine checkups, and counseling services. Lastly, the agent's health is affected by a measure of benefits one receives as a member of a faith community which flow from the community to the individual. Similar to Bednarek, Jeitschko, and Pecchenino (2006), the health production function takes the form of equation 3, specifying the channels through which community membership may benefit the individual, and how time spent in other activities may positively or negatively affect the time specifically dedicated to one's physical and emotional health:

$$(3) \quad h(t^h, m) = \mu m + \gamma(t^h - \sigma^w t^w - \sigma^s t^s),$$

$$\mu, \gamma > 0, \quad \sigma^w \in [0, 1], \quad \sigma^s \in [-1, 1].$$

The benefit one gets per unit of medical care, μ , or per unit of healthy activity, γ , depends on one's ability to cope with stress, to make sense

10 FAITH & ECONOMICS

of a complex universe. This, in turn, may depend on one's religious or spiritual practice or place in a faith/spiritual community.¹⁸ We liken this, as mentioned above, to Antonovsky's sense of coherence, or the spiritual capital one has accumulated in one's community. Spiritual capital or sense of coherence (or what gives you a sense of coherence) depends, among other things, on the resources controlled by one's community, time spent in communal interaction, and the spiritual guidance provided by, institutional strength, moral authority, doctrinal consistency, and stability of one's Church or spiritual foundation.

Time at work and time in spiritual activities affects the time one needs to spend in healthy activities. Time spent in healthy activities may be increased by work-related stress, $\sigma^w t^w$, where σ^w measures the marginal impact of time spent at work on time spent in healthy activities, but may be reduced by time spent in spiritual pursuits, $\sigma^s t^s$, such as prayer (Powell et al., 2003). However, for some, time spent in spiritual activities could be deleterious to their health. This could be the case for one in conflict with the tenets of their faith or having a crisis of faith. For others there is little or no value, either direct or indirect, of spiritual activities. Thus σ^s can be either positive or negative, and measures the marginal impact of time spent in spiritual activities on time in healthy activities.

2.2 Constraints

Having given the agent's objective, we now consider the constraints that the agent faces. There are two types of constraints: standard resource constraints, as well as behavioral constraints that are tied to societal, cultural, and psychological factors. The latter are captured in part by the shape of the utility function. We address these in turn.

Societal, Cultural, and Psychological Constraints: Societal, cultural, and psychological stresses also affect one's ability to enjoy consumption of goods and leisure. This is reflected in the functional form of U .

$$(4) \quad U(c, t^\ell, \chi(t^s, \bar{s}), h(t^h, m)) = (c - \xi(g_1, g_2))^\alpha (t^\ell - \lambda(g_1, g_2))^\beta \chi(t^s, \bar{s}) h(t^h, m)^\nu, \\ 0 < \alpha, \beta, \nu < 1, \quad \alpha + \beta + \nu \leq 1,$$

with χ and h given by equations 2 and 3.

The effects of material consumption and leisure are modeled using socially referenced preferences. That is, individuals look to the consumption and leisure activities of their reference group, perhaps chosen for self-improvement (comparison upward) or self-enhancement (comparison downward) purposes (Falk & Knell, 2004) to evaluate their own well-

being.¹⁹ These social norm or Veblen effects are accounted for by the ξ and λ parameters.²⁰ As a consequence, individuals' choices depend both on their own resources and also on the consumption and leisure activities of their reference group. Thus, let $\xi(g_1, g_2) [\lambda(g_1, g_2)]$ represent socially referenced consumption [leisure]. We assume one's inherent spirituality, as measured in part by g_1 and g_2 , may affect one's ability to cope with perceived social or psychological pressures by providing the individual with the ability to place less emphasis on keeping up with the Joneses and more emphasis on what is truly, existentially, and transcendentally, important.²¹ But, it may be that one's inherent spirituality is powerless against societal demands. In this case ξ and λ will be constants. We examine both cases. Thus, we have

$$\xi(0, x), \xi(y, 0) > 0, \lambda(0, x), \lambda(y, 0) > 0 \text{ for all } x, y, \text{ and } \xi_i \leq 0, \lambda_i \leq 0, i = 1, 2.$$

Resource Constraints: To complete our model, we note that the individual has a single unit of time to allocate. Because individuals generally have little control over their work hours once they take a job, we assume that labor is supplied inelastically at t^w ;²² the remaining time is divided among leisure t^l , health enhancing activities t^h , and spiritual pursuits t^s .

$$(5) \quad 1 = t^l + t^s + t^h + t^w$$

Individuals divide their after tax income, $(1 - \tau)t^w w$, where w is the hourly wage and $\tau \geq 0$ is the tax rate, between consumption goods, c (priced at p^c), health enhancing medical goods, m (priced after tax deduction at $(1 - \tau)p^m$),²³ and spiritual expenditures, such as in-kind donations (food, clothing, professional services), as well as cash donations or tithes, s , (priced after tax deduction at $(1 - \tau)p^s$). The effect of these on one's spirituality are defined relative to income, to be consistent with Mark (12:43b–44) that it is not absolute donations but relative donations that matter:

$$(6) \quad (1 - \tau)t^w w = p^c c + (1 - \tau)p^m m + (1 - \tau)p^s s \Rightarrow \bar{s} = \frac{t^w w - \frac{p^c c}{1 - \tau} - p^m m}{p^s t^w w}.$$

In this analysis we are interested in determining how individuals allocate their resources taking their place in the world as given. In a companion piece (DeLeire et al., 2007), we examine the formation of community and thus look into the source of these benefits.

3 Caring for the Body, Mind, and Spirit

Individuals must choose how to allocate their time and their money among the various uses to maximize their well-being. To solve the

12 FAITH & ECONOMICS

individual's maximization problem, substitute equations 2 through 6 into equation 1 to yield the individual's overall well-being:

$$(7) \quad W = (c - \xi(g_1, g_2))^\alpha (1 - t^s - t^h - t^w - \lambda(g_1, g_2))^\beta (1 + t^s)^{g_1} \left(1 + \frac{t^w w - \frac{p^c c}{1 - \tau} - p^m m}{p^s t^w w} \right)^{g_2} \\ \times (\mu m + \gamma(t^h - \sigma^w t^w + \sigma^s t^s))^v.$$

Maximize equation 7 with respect to t^s , c , m , and t^h . The first-order conditions of the individual's problem with respect to t^s , c , m , and t^h , respectively, are, after some simplification

$$(8) \quad g_1(t^\ell - \lambda(g_1, g_2))h = (1 + t^s)[\beta h - \gamma\sigma^s(t^\ell - \lambda(g_1, g_2))]$$

$$(9) \quad \frac{\frac{p^c}{1 - \tau} g_2}{p^s t^w w} (c - \xi(g_1, g_2)) = \alpha(1 + \bar{s})$$

$$(10) \quad \frac{p^m g_2}{p^s t^w w} h = \mu\nu(1 + \bar{s})$$

$$(11) \quad \beta h = \gamma(t^\ell - \lambda(g_1, g_2)).$$

The individual equates the marginal benefit of time spent in spiritual pursuits to the marginal cost of leisure foregone, equation 8. Notice, the marginal benefit of spiritual time has two components since it provides direct benefits in terms of spiritual well-being and indirect benefits in terms of physical and mental health. In equation 9 he equates the marginal benefit of material consumption to its marginal costs in terms of spiritual expenditures foregone, while in equation 10 he equates the marginal benefit of expenditures on medical care with the marginal cost of spiritual expenditures foregone. Finally, in equation 11 he equates the marginal benefit of time spent in healthy pursuits to the marginal cost of leisure foregone.

Solving the system (see appendix 1) yields the following results, where we denote equilibrium values with an asterisk.

Proposition 1: *Whenever one's spirituality does not serve to protect one from certain (perceived or actual) negative social pressures associated with material consumption and time,*

$$\frac{d\xi}{dg_1} = \frac{d\lambda}{dg_1} = 0,$$

physical and mental health h^ are decreasing, whereas medical expenditures m^* are increasing, in one's spirituality. That is,*

$$\frac{dh^*}{dg_1} < 0 \text{ and } \frac{dm^*}{dg_1} > 0.$$

Moreover, the more important the community is to one's spirituality, the lower one's physical and mental health as well as one's medical expenditures. That is,

$$\frac{dh^*}{dg_i} > 0 \text{ and } \frac{dm^*}{dg_i} < 0 \quad i=1,2$$

The effects of spirituality on health are potentially complex and may work through a number of distinct channels. It is important, however, to note that while those who are most affected by their involvement in their spiritual communities (those with the highest indices of community and spirituality, g_2 and g_1 , respectively) need not also be the healthiest,²⁴ they do have greater subjective well-being than their less altruistic and community oriented peers. These results are consistent with Ferriss (2002) and Ellison (1991) who both show that the more religious, spiritual, and altruistic by our definition are also happier. But, if we exclude the possibility that greater spirituality reduces one's susceptibility to social pressures and norms, that is if we let

$$\frac{d\xi}{dg_1} = \frac{d\lambda}{dg_1} = 0 \quad ,$$

then the more spiritual will be less healthy, and they will spend more on traditional medical care than their less spiritual peers. Greater concern for one's community relative to oneself unambiguously reduces health and medical care expenditure—all else equal: in caring more for others one cares less for oneself. These results contradict an extensive body of empirical research, reviewed in section 1, which suggests that the effects of spirituality on health work through additional channels, such as reducing one's susceptibility to social expectations.

Corollary: *Physical and mental health increase and medical expenditures decrease with the level of spirituality,*

$$\frac{dh^*}{dg_i} > 0 \text{ and } \frac{dm^*}{dg_i} < 0 \quad i=1,2 \quad ,$$

whenever one's spirituality provides sufficient protection (see appendix) from certain (perceived or actual) negative social pressures associated with material consumption and time.

14 FAITH & ECONOMICS

The effects of greater spirituality on the choice to seek medical care and on one's physical and mental health are indirect. If these indirect effects on an individual's resource allocation choices are adequately strong, they increase an individual's resistance to social pressures, the need to keep up with the Joneses (Blanchflower & Oswald, 2004), freeing both income and time for other, perhaps health enhancing, uses. But, should there be a crisis in one's spiritual organization or church such as the pedophilia scandal in the Catholic Church or the threat of schism in the Anglican Communion, then the moral authority of the Church may be undermined, which has an impact upon the Church's ability to act as a spiritual guide. This feeds back to affect the spiritual health of community members, thereby undermining their subjective well-being. As a result, their willingness to devote time and money to the community may decline (Post, 2003; *Economist*, 2005). Yet faith communities often survive as their members can see beyond the failings of their leaders as, indeed, they are instructed to do (Matt. 23:2–3).

Proposition 2: *Health increases while medical expenditures decrease with γ , the marginal benefit of time spent in healthy activities. But, while health increases with μ , the marginal benefit of health expenditures, medical expenditures rise (fall) at low (high) levels of income,*

$$\frac{dh^*}{d\gamma} > 0, \frac{dm^*}{d\gamma} < 0$$

$$\frac{dh^*}{d\mu} > 0 \text{ and } \exists \hat{w} \ni \frac{dm^*}{d\mu} < (>) 0 \quad \forall w > (<) \hat{w}.$$

The more religious, usually defined as the more observant, have repeatedly been shown to be healthier. This health benefit of spirituality may work through an indirect community channel via one's spiritual capital or sense of coherence, which is developed in community and depends on one's fellow community members as well as oneself.²⁵ Thus, if we compare two individuals who are identical except one has a stronger sense of coherence or more spiritual capital, a more secure place in the community or the implicit or explicit support of the community (George et al., 2000; Powell et al., 2003), or stronger faith (Ellison, 1991; DeVido, 2003; Goldhaber, 2003), developed through one's life but modeled as an endowment in our static model, that is, higher μ or γ , then the former will be healthier, both broadly and narrowly defined.²⁶ Further, those with higher γ , or higher μ , if of adequate means, those less susceptible to the slings and arrows of everyday life, will also spend less on medical care and less time in purely healthy activities, opting instead for more spiritual activities, while still

enjoying better health. These are the healthy individuals to whom Koenig et al. (2001, p. 4) refer, those devout in religious belief and practice, who will be both more resistant to health problems and respond more positively to treatments, and so will be less likely to require expensive interventions to cure them. To the extent that this spiritual capital or sense of coherence is a function of one's communal religious practice, and distinct from social capital resulting from membership and participation in nonreligious groups and activities, those whose spirituality is nurtured in a non-religious setting do not have this resource to draw upon. This is consistent with Putnam (2000) who finds that the health benefits of time spent in civic and social groups reach an interior maximum while the health benefits of time spent in religious practice is increasing over the entire range.

4 Is There a Role for Public Policy?

While it is impossible to conduct a full policy analysis within the framework of this model, it is possible to reveal some of the consequences of public policies on religious organizations and their members.

A major public policy concern today is the rising cost of health care. This cost increase may be manifested in a number of ways: higher prices of medical services, higher costs of providing health insurance which lead to reduced insurance provision and higher costs to individuals in terms of prices and reduction of access (which is equivalent to a higher price), lower hourly wages as firms replace salary with benefits. Thus, the price of medical care to the individual can rise even as the cost of procedures has declined. We examine this case.

Proposition 3: *An increase in the cost of medical care to the individual, p^m , trivially reduces health but also reduces time spent in spiritual activities*

$$\frac{dh^*}{dp^m} < 0, \frac{dt^{s*}}{dp^m} < 0.$$

Moreover, at low (high) levels of income spiritual donations rise (fall) with the cost of medical care

$$\exists \hat{w} \ni \frac{d\bar{s}^*}{dp^m} > (<) 0 \quad \forall w < (>) \hat{w}.$$

The increase in the cost of medical care causes individuals to substitute away from the relatively more expensive medical care into the now relatively cheaper consumption goods and spiritual expenditures. But, since real income is now lower, demand for all goods is reduced: spiritual

16 FAITH & ECONOMICS

expenditures fall and less is spent directly on health. A decrease in time spent in spiritual pursuits reduces the strength of the community. This may cause γ or μ to fall, leading to a secondary negative effect which magnifies the initial effect (proposition 2).

However, the price change entails both income and substitution effects. For low income individuals the latter dominate the former. These individuals, now made poorer by the increase in the cost of medical care, increase their donations relative to their income, the solace provided by helping others offsetting, in part, their lessened ability to help themselves.

Since income and substitution effects affect the wealthy differently from the poor, one must be concerned about the aggregate effects on religious community resources, the subsequent effects on γ or μ and thereby on community member health (proposition 2).

As health care costs have risen, firms have reduced the insurance coverage provided for their workers, thereby generating a discrete jump in costs for these workers. The government has had to (or will have to) increase taxes or fees to pay for its healthcare programs, such as Medicare and Medicaid, or it too will have to reduce coverage. Workers, thus, have been doubly hit by higher costs of medical care as a result of reduced insurance coverage and lower after tax wages as a result of higher taxes to fund Medicare and Medicaid, the second effect working in the same direction as the first. Medicaid and, to a lesser extent, Medicare are redistributive programs from the relatively rich to the relatively poor. The effects of these redistributions can, unintentionally, reduce spiritual capital investment.

Proposition 4: *Redistributive social welfare programs may crowd out spiritual capital investment and thereby reduce agent health.*

$$\frac{dx}{d\tau} < 0 \text{ and } \frac{dx}{dw} > 0 \text{ for } x = t^*, h^*$$

$$\frac{d\bar{s}^*}{d\tau} < 0 \text{ and } \exists \hat{w} \ni \frac{d\bar{s}^*}{dw} > (<)0 \quad \forall w > (<)\hat{w}.$$

A higher tax rate reduces one's disposable income, and this negative income effect is dominant when allocating one's resources of both time and money. Time is reallocated toward healthy activities and away from spiritual pursuits, and since one's income is lower, expenditures on all goods, including donations to one's spiritual community, fall. Thus, if taxes on the relatively wealthy increase to pay for improvements in social welfare programs such as Medicaid and Medicare, for the relatively poor (a

lowering of the poor's medical care costs and, possibly, taxes, or increasing their income via transfers), all else equal, donations to churches by the relatively rich (proposition 4) will fall (via the income effect) and those by the relatively poor (propositions 3 and 4) may fall, and the spiritual time spent by the relatively rich will also fall (via the substitution effect).

As relatively rich individuals reduce their time and monetary resources spent on religious activity due to more expensive health care or higher taxes to pay for medical care programs for the poor, resources are extracted from religious communities in terms of both time and money. Additional resources are drained as a result of the broader social programs. As the resources controlled by the community, as well as time spent interacting with one's fellow community members, fall, the individual's spiritual capital and his sense of coherence will be adversely affected thereby reducing γ and μ . These indirect effects all lead to reductions in individuals' health (proposition 2). Thus, to the extent that religious communities are called upon to fill the breach left by ever higher health care costs, as they have in some instances, e.g., in response to the 1996 Welfare Reform legislation (Hungerman, 2004), their ability to do so may be impeded.

The state could ameliorate the effects of the increase in health care costs by directly increasing the resources available to churches by reducing the price of spiritual goods, p^s , via increasing the tax deductibility of donations to charitable organizations,²⁷ such as one's faith community, while holding the income tax rate fixed. Or if pastoral care makes the provision of health care more efficient, thereby lowering p^m , the government could subsidize this care. Or the costs of spiritual goods or time spent in spiritual activities could be lessened by improving access to religious services by restricting other activities, such as work or shopping, on the Sabbath(s). But, in terms of relative price effects, it may be the market rather than the state that is most powerful since, as a result of technological improvements, the price of many consumption and medical goods have been in secular decline, thereby increasing the relative price of spiritual goods. The net effect is an increase in the material over the spiritual, a standard trajectory of most, although not all, wealthy societies.²⁸

Proposition 5: *The lower is the price of the spiritual relative to the material, the higher relative donations to one's church or spiritual organization are,*

$$\frac{d\bar{s}^*}{dp^s}, \frac{d\bar{s}^*}{dp^m}, \frac{d\bar{s}^*}{dp^c} < 0.$$

18 FAITH & ECONOMICS

Propositions 3–5 establish how public policy can intentionally affect individuals' choices concerning spiritual investment, either in oneself or in one's community. Public policy also, intentionally or not, can have mitigating or negative effects. For example, tax financed funding for and staffing of religious organizations (as is found in many European countries) can crowd out individual donations of both money and time, reducing the communal benefits of religious practice, as suggested by Iannaccone, Finke, and Stark (1997) and Stark and Finke (2000), and consistent with proposition 4.

5 Conclusion

We present a model of choice in which an individual divides his time between work, leisure, healthy activities, and spiritual activities, and divides his income between material consumption, physical and mental health care, and gifts/donations to his spiritual community. The competing demands on the individual's time and money so central to modern life are made explicit. The individual balances the costs and benefits of the various uses of his time and his money to maximize his well-being.

We find that the subjective well-being of the more spiritual will be higher, but they may not be healthier than their peers, while those whose spirituality and whose membership in a spiritual community provides a stronger ability to cope with stress and illness will have both higher levels of health and subjective well-being. To the extent that it is specifically religious faith that allows one to withstand the uncompensated pressures and demands of society, then the religious will have higher levels of health and subjective well-being than their non-religious peers.

These positive health effects of religious faith and their external benefits in terms of lower health care needs and usage are potentially amenable to exploitation by public policy. The current policies of tax deductibility of donations to one's church, increased accessibility via tax exempt status of churches as well as restrictions on work and commerce on Sabbath and holy days, all can indirectly foster church attendance and charitable giving, leading to greater spirituality and better health outcomes. But the state can crowd out the church. A reduction in the price of health care for the poor funded by higher taxes on the rich may reduce donations to faith communities as well as time spent in spiritual pursuits. The government's social programs inadvertently increase the relative cost of membership in a faith community, thereby reducing the community's ability to fulfill its mission, either to its own or the wider community. Similar forces work on

non-religious charitable and civic organizations in which individuals find spiritual fulfillment. While our analysis is partial equilibrium in nature, so long as faith and other charitable organizations are more efficient at providing social services, either directly or as a result of positive spillovers from communal practice, the lost revenue from tax breaks could more than pay for themselves in terms of improved health and, thus, lower health care usage.

Thus, while faith, spirituality, and religious devotion, as well as civic engagement, cannot be mandated by the state, they can be facilitated or impeded by it. It is necessary, therefore, for churches, and other religious and spiritual communities as well as civic organizations to articulate clearly the nature and worth of their missions and the mechanisms by which religious practice and altruism foster health of the body and mind as well as the spirit.

Appendix 1

For convenience, we rewrite the model in full. Let an individual's well-being be defined by the composite function

$$(1) \quad U(c, t^\ell, \chi(t^s, \bar{s}), h(t^h, m))$$

where

$$(2) \quad \chi(t^s, \bar{s}) = (1+t^s)^{g_1} (1+\bar{s})^{g_2}, \quad g_1 \geq 0, \quad g_2 \geq 0, \quad a_1 \geq 1, \quad a_2 \geq 1,$$

$$(3) \quad h = \mu m + \gamma(t^h - \sigma^w t^w - \sigma^s t^s), \quad \mu, \gamma > 0, \quad \sigma^w \in [0, 1], \quad \sigma^s \in [-1, 1].$$

$$(4) \quad U(c, t^\ell, \chi(t^s, \bar{s}), h(t^h, m)) = (c - \xi(g_1, g_2))^\alpha (t^\ell - \lambda(g_1, g_2))^\beta \chi(t^s, \bar{s}) h(t^h, m)^\nu$$

$$\alpha + \beta + \nu \leq 1, \quad 0 < \alpha, \beta, \nu < 1, \quad \xi(0, x), \xi(y, 0) > 0, \quad \lambda(0, x), \lambda(y, 0) > 0 \text{ for all } x, y,$$

$$\text{and } \xi_i \leq 0, \lambda_i \leq 0, i = 1, 2.$$

$$(5) \quad 1 = t^\ell + t^s + t^h + t^w$$

$$(6) \quad \bar{s} = \frac{t^w w - \frac{p^c c}{1-\tau} - p^m m}{p^s t^w w} \quad \text{where } t^w w = \frac{p^c c}{1-\tau} + p^m m + p^s s$$

The individual agent chooses t^s , c , m , and t^h to maximize

20 FAITH & ECONOMICS

$$(7) \quad W = (c - \xi(g_1, g_2))^\alpha (1 - t^s - t^h - t^w - \lambda(g_1, g_2))^\beta (1 + t^s)^{g_1} \left(1 + \frac{t^w w - p^c c - p^m m}{p^s t^w w} \right)^{g_2} \\ \times (\mu m + \gamma(t^h - \sigma^w t^w + \sigma^s t^s))^v.$$

which defines the individual's subjective well-being. The first-order conditions of the individual's problem with respect to t^s , c , m , and t^h , respectively, are,

$$(8) \quad g_1(t^\ell - \lambda_0)h - (1 + t^s)[\beta h - \gamma\sigma^s(t^\ell - \lambda_0)] = 0$$

$$(9) \quad -\frac{p^c}{p^s t^w w} g_2 (c - \xi_0) + \alpha(1 + \bar{s}) = 0$$

$$(10) \quad -\frac{p^m g_2}{p^s t^w w} h + \mu\nu(1 + \bar{s}) = 0$$

$$(11) \quad -\beta h + \gamma(t^\ell - \lambda(g)) = 0.$$

Combine equations 8 and 11 to derive the definition of t^s

$$(12) \quad t^s = \frac{g_1}{g_1 + \beta(1 - \sigma^s)} (1 - t^h - t^w - \lambda_0) - \frac{\beta(1 - \sigma^s)}{g_1 + \beta(1 - \sigma^s)}.$$

Combine equations 12 and 5 to derive the definition of t^l

$$(13) \quad t^\ell = \frac{\beta(1 - \sigma^s)}{g_1 + \beta(1 - \sigma^s)} (1 - t^h - t^w) + \frac{g_1 \lambda_0 + \beta(1 - \sigma^s)}{g_1 + \beta(1 - \sigma^s)}.$$

Combine 10, 11, and 13 to yield

$$(14) \quad m = \frac{2t^w w - \frac{p^c c}{1 - \tau}}{p^m} - \frac{g_2 \gamma(1 - \sigma^s)[2 - t^h - t^w - \lambda_0]}{\mu[g_1 + \beta(1 - \sigma^s)]}.$$

Combine 9 and 10 to derive the definition of c ,

$$(15) \quad c = \frac{p^m}{p^c} \frac{\alpha \gamma}{\mu} \frac{(1 - \sigma^s)}{g_1 + \beta(1 - \sigma^s)} [2 - t^h - t^w - \lambda_0] + \xi_0 \\ 1 - \tau$$

Combine 14 and 15 to define m

$$(16) \quad m = \frac{2t^w w - \frac{P^c}{1-\tau} \xi()}{p^m} - \frac{\gamma(1-\sigma^s)(\alpha + g_2)[2-t^h - t^w - \lambda()]}{\mu[g_1 + \beta(1-\sigma^s)]}$$

Combine 3, 12, and 16 to derive the definition of h

$$(17) \quad h = \mu \left[\frac{2t^w w - \frac{P^c}{1-\tau} \xi()}{p^m} \right] + \gamma(t^h - \sigma^w t^w) + \frac{(1-t^h - t^w - \lambda())\gamma[g_1\sigma^s - (\alpha + g_2)(1-\sigma^s)]}{g_1 + \beta(1-\sigma^s)} - \frac{\gamma(1-\sigma^s)[(\alpha + g_2) + \sigma^s \beta]}{g_1 + \beta(1-\sigma^s)}$$

Combine 6, 15 and 16 to define \bar{s}

$$(18) \quad \bar{s} = \frac{p^m g_2 \gamma(1-\sigma^s)(1-t^h - t^w - \lambda())}{\mu p^s t^w w [g_1 + \beta(1-\sigma^s)]} - 1$$

Finally, combine 11, 13 and 17 to implicitly define t^h

$$(19) \quad -\mu \left[\frac{2t^w w - \frac{P^c}{1-\tau} \xi()}{p^m} \right] - \gamma(t^h - \sigma^w t^w) - \frac{(1-t^h - t^w - \lambda())\gamma[g_1\sigma^s - (g_2 + \alpha + \nu)(1-\sigma^s)]}{g_1 + \beta(1-\sigma^s)} + \frac{(1-\sigma^s)\gamma(g_2 + \alpha + \nu) + \sigma^s \beta}{g_1 + \beta(1-\sigma^s)} = 0.$$

Appendix 2

Total differentiation of equation 19 and the various definitions of the endogenous variables yields the following results under the following assumption on parameter values:

A1. $t^h - \sigma^w t^w > 0$. Work time is not so large as to force desired time in healthy activities negative.

Proof of Proposition 1:

$$\frac{dh}{dg_1} = -v \left[\frac{\gamma(1-\sigma^s)(2-t^h-t^w-\lambda)}{[g_1+\beta(1-\sigma^s)]} \right] \left[\frac{1}{g_1+g_2+\alpha+\beta+v} \right] < 0$$

$$\frac{dm}{dg_1} = \left[\frac{\gamma(\alpha+g_2)(1-\sigma^s)(2-t^h-t^w-\lambda)}{\mu[g_1+\beta(1-\sigma^s)][g_1+g_2+\alpha+\beta+v]} \right] > 0$$

$$\frac{dh}{dg_2} = -v \left[\frac{\gamma(1-\sigma^s)(2-t^h-t^w-\lambda)}{[g_1+\beta(1-\sigma^s)]} \right] \left[\frac{1}{g_1+g_2+\alpha+\beta+v} \right] < 0$$

$$\frac{dm}{dg_2} = - \left[\frac{\gamma(1-\sigma^s)(2-t^h-t^w-\lambda)}{\mu[g_1+\beta(1-\sigma^s)]} \right] \left[\frac{g_1+\beta+v}{g_1+g_2+\alpha+\beta+v} \right] < 0.$$

Proof of Corollary:

$$\frac{dh}{dg_1} = - \left[\frac{v}{g_1+g_2+\alpha+\beta+v} \right] \left\{ \left[\frac{\gamma(1-\sigma^s)(2-t^h-t^w-\lambda)}{[g_1+\beta(1-\sigma^s)]} \right] + \frac{\mu \frac{p^c}{1-\tau} \xi_1 + \gamma \lambda_1}{p^m} \right\} > 0$$

$$\text{if } \left[\frac{\gamma(1-\sigma^s)(2-t^h-t^w-\lambda)}{[g_1+\beta(1-\sigma^s)]} \right] < - \left[\frac{\mu \frac{p^c}{1-\tau} \xi_1 + \gamma \lambda_1}{p^m} \right],$$

that is, if the indirect effects of greater spirituality on social norms exceed the direct effects on the allocation of resources.

$$\begin{aligned} \frac{dm}{dg_1} &= \left[\frac{\gamma(\alpha+g_2)}{\mu[g_1+\beta(1-\sigma^s)][g_1+g_2+\alpha+\beta+v]} \right] \times \\ &\quad \left[(2-t^h-t^w-\lambda)(1-\sigma^s) + \lambda_1[g_1+\beta(1-\sigma^s)] \right] \\ &\quad - \left[\frac{g_1+\beta+v}{g_1+g_2+\alpha+\beta+v} \frac{\frac{p^c}{1-\tau} \xi_1}{p^m} \right] < 0 \end{aligned}$$

if the indirect effect of greater spirituality on the allocation of time to leisure, λ_1 , is large.

$$\frac{dh}{dg_2} = -\nu \left[\frac{\gamma(1-\sigma^s)(2-t^h-t^w-\lambda)}{g_1+\beta(1-\sigma^s)} \right] \left[\frac{1}{g_1+g_2+\alpha+\beta+\nu} \right] - \left[\frac{\mu p^c \nu \xi_2}{(1-\tau)p^m} + \frac{\mathcal{W}g_1\lambda_2}{g_1+\beta(1-\sigma^s)} \right] \left[\frac{1}{g_1+g_2+\alpha+\beta+\nu} \right] > 0$$

if the indirect effects on the social norms exceed the direct effects on the allocation of resources.

$$\frac{dm}{dg_2} = - \left[\frac{\gamma(1-\sigma^s)(2-t^h-t^w-\lambda)}{\mu[g_1+\beta(1-\sigma^s)]} \right] \left[\frac{g_1+\beta+\nu}{g_1+g_2+\alpha+\beta+\nu} \right] - \frac{p^c \xi_2}{p^m(1-\tau)} \left[\frac{g_1+\beta+\nu}{g_1+g_2+\alpha+\beta+\nu} \right] + \frac{(\alpha+g_2)\lambda_2}{\mu[g_1+g_2+\alpha+\beta+\nu]} < 0$$

unless the indirect effect of greater spirituality on the allocation of resources to consumption is very strong, ξ_2 large.

Proof of Proposition 2:

$$\frac{dh}{d\mu} = \nu \frac{[2t^w w - \frac{p^c}{1-\tau} \xi]}{p^m [g_1 + g_2 + \alpha + \beta + \nu]} > 0$$

$$\frac{dh}{d\gamma} = \nu \left[\frac{t^h - \sigma^w t^w + (2-t^h-t^w-\lambda) - \sigma^s}{g_1 + g_2 + \alpha + \beta + \nu} \right] > 0$$

$$\frac{dm}{d\mu} = \frac{\gamma(1-\sigma^s)(\alpha+g_2)}{\mu[g_1+\beta(1-\sigma^s)]} \left[\frac{(2-t^h-t^w-\lambda)}{\mu} - \frac{[2t^w w - \frac{p^c}{1-\tau} \xi][g_1+\beta(1-\sigma^s)]}{\gamma p^m (1-\sigma^s)(g_1+g_2+\alpha+\beta+\nu)} \right] < 0$$

if the substitution effect exceeds the income effect via a lower effective price of health.

$$\frac{dm}{d\gamma} = - \frac{\alpha+g_2}{\mu[g_1+g_2+\alpha+\beta+\nu]} [(2-t^w-\lambda) - \sigma^s - \sigma^w t^w] < 0$$

Proof of Proposition 3:

$$\frac{dh}{dp^m} = -\frac{\mu\nu[2t^w w - \frac{P^c}{1-\tau}\xi]}{(p^m)^2[g_1 + g_2 + \alpha + \beta + \nu]} < 0$$

$$\frac{dt^s}{dp^m} = -\frac{\mu g_1[2t^w w - \frac{P^c}{1-\tau}\xi]}{(p^m)^2 \gamma(1-\sigma^s)[g_1 + g_2 + \alpha + \beta + \nu]} < 0$$

$$\frac{d\bar{s}}{dp^m} = -\frac{\gamma(1-\sigma^s)g_2}{p^s t^w [g_1 + \beta(1-\sigma^s)]} \left[\frac{[2t^w w - \frac{P^c}{1-\tau}\xi][g_1 + \beta(1-\sigma^s)]}{p^m \gamma(1-\sigma^s)(g_1 + g_2 + \alpha + \beta + \nu)} - \frac{2-t^h - t^w - \lambda}{\mu} \right]$$

The term in brackets is negative for w small and positive for w large and strictly increasing in w . Thus,

$$\exists \hat{w} \ni \frac{d\bar{s}}{dp^m} > (<)0 \quad \forall w < (>)\hat{w}.$$

Proof of Proposition 4:

$$\frac{d\bar{s}}{dw} = -\frac{p^m g_2 \gamma(1-\sigma^s)}{\mu p^s t^w [g_1 + \beta(1-\sigma^s)]} \times \left[\frac{p^m \gamma(g_1 + g_2 + \alpha + \beta + \nu)(1-\sigma^s)(1-t^h - t^w - \lambda) - 2\mu t^w w (g_1 + \beta(1-\sigma^s))}{w p^m \gamma(g_1 + g_2 + \alpha + \beta + \nu)(1-\sigma^s)} \right]$$

The term in brackets is positive for w small and negative for w large and strictly decreasing in w . Thus,

$$\exists \hat{w} \ni \frac{d\bar{s}}{dw} > (<)0 \quad \forall w > (<)\hat{w}.$$

$$\frac{dt^s}{dw} = \frac{2\mu t^w g_1}{\gamma[g_1 + g_2 + \alpha + \beta + \nu]p^m} > 0$$

$$\frac{dh}{dw} = \frac{2\mu t^w \nu}{[g_1 + g_2 + \alpha + \beta + \nu]p^m} > 0$$

$$\frac{d\bar{s}}{d\tau} = -\frac{p^m g_2 p^c \xi}{p^s t^w (1-\tau)^2} \frac{1}{g_1 + g_2 + \alpha + \beta + \nu} < 0$$

$$\frac{dt^s}{d\tau} = -\frac{\mu p^c \xi g_1}{p^m \gamma (1-\tau)^2} \frac{1}{[g_1 + g_2 + \alpha + \beta + \nu](1-\sigma^s)} < 0$$

$$\frac{dh}{d\tau} = -\frac{\mu p^c \xi}{(1-\tau)^2 p^m} \frac{\beta + \nu}{g_1 + g_2 + \alpha + \beta + \nu} < 0$$

Proof of Proposition 5:

$$\frac{d\bar{s}}{dp^s} = -\frac{p^m g_2 \gamma (1-\sigma^s) (1-t^h - t^w - \lambda)}{\mu (p^s)^2 t^w w [g_1 + \beta(1-\sigma^s)]} < 0$$

$$\frac{d\bar{s}}{dp^c} = -\frac{g_2 \gamma \xi}{p^m (1-\tau) p^s t^w w [g_1 + g_2 + \alpha + \beta + \nu]} < 0$$

$$\frac{d\bar{s}}{dp^m} = -\frac{\gamma (1-\sigma^s) g_2}{p^s t^w w [g_1 + \beta(1-\sigma^s)]} \left[\frac{[2t^w w - \frac{p^c}{1-\tau} \xi] [g_1 + \beta(1-\sigma^s)]}{p^m \gamma (1-\sigma^s) (g_1 + g_2 + \alpha + \beta + \nu)} - \frac{2-t^h - t^w - \lambda}{\mu} \right] < 0$$

if the negative income effect exceeds the positive substitution effect.

Endnotes

- 1 Notably, Gruber (2005) attempts to empirically trace a relationship between religiosity and overall well-being.
- 2 In their study of subjective well-being, economists Blanchflower and Oswald (2004) find that being religious increases one’s happiness, but choose not to include the religiosity variable in their preferred regressions as it did not affect other coefficients. Oswald (1997) examines what makes people unhappy, but again chooses not to use religious practice as a control.
- 3 While psychologists have long recognized a positive or negative interdependency between spiritual and mental health, they regularly see them as distinct.

26 FAITH & ECONOMICS

- 4 Since much of the empirical work on health and spirituality has used religious practice as an indicator of spirituality, we will also use religion as a basis for spirituality while recognizing that it is not the only one.
- 5 For example, for a Christian “this [spiritual] experience is neither received nor lived in isolation. Christian life in the Spirit takes place in an ecclesial context; hence... Christian spirituality is that of a group, whether the family, the parish, or specialized groups giving rise to various schools or traditions of spirituality” (Marmion, p. 18).
- 6 Clearly, a member of a faith community may choose to dedicate time, but not money, or money but not time, or both time and money to his community as part of his spiritual development. What is important for our purposes is that the individual defines himself as a member of a community; the strengths of those bonds are determined by both the actions of the individual toward the community and the community toward the individual. These bonds are subsumed in the parameters of the model.
- 7 The benefits of group membership, often referred to as social capital—“an instantiated informal norm that promotes cooperation between two or more individuals” (Fukuyama, 1999, p.1)—come from the reduction in transactions costs so common objectives can be more easily achieved. Here the common objective is spiritual, and communal (ritual) practice may provide an easier way to achieve one’s spiritual goals. Or the common objective could be a civic goal where the spiritual benefits are derived indirectly from group membership.
- 8 While preferences over spirituality as well as health may be endogenous, to examine this would require a specifically dynamic model. In this model we are interested in examining the pathways through which spirituality can improve health and well-being. Pecchenino (2008) examines preference change and spiritual growth as a result of life changing events, such as the Damascene conversion of St. Paul.
- 9 To place our analysis in a single specifically religious framework, our modeling choices concerning spirituality are informed by Christian theology and scripture. Similar analyses can be conducted using other theological or spiritual traditions. Specifically, the spirituality function in this paper has its basis in a Christian moral theology with scriptural references used for motivational purposes. Similar functions can be developed using Jewish, Islamic, or other religious ethical and moral reasoning as a basis. It might also be noted that within Christianity, different Christian traditions approach moral theology and ethical reasoning with differing emphases which may sometimes be seen as different moral theologies.

- 10 From a theological perspective spirituality is not distinct from other aspects of life. Instead, human living is examined not only from the standpoint of what it is in itself, but also from the perspective of what God has “created” human life to be, of how God “envisions” authentic and fulfilled human life. Consequently, well-being from the perspective of theology, specifically character ethics (Frankena, 1973), can be defined more by determining whether an individual is living a virtuous life, where virtue is seen as how one’s actions will influence the type of person one wishes to become. In this setting, one’s motives, one’s reasons for taking an action, for living in a particular way, may be more important than the resources expended and consumed in terms of well-being achieved.
- 11 Consistent with this story, we make the connection between the act of giving (either of oneself, time, or money) being valued relative to what one has rather than how much it increases what the recipient obtains.
- 12 Although time spent at work may have a positive spill-over effect on one’s spirituality, we do not model this potential transmission channel.
- 13 For example, some attend religious services or are members of charitable organizations, or make donations to religious or other charitable organizations not to improve their spiritual well-being but rather to make business contacts and thereby improve their material well-being. Thus, their expenditures of time and money may have little effect on their spirituality and are better considered part of their work or leisure time and their consumption expenditures.
- 14 These indexes could be positively related to the spiritual guidance and sense of coherence provided by membership in a religious community via ritual and the clergy. The quality of this guidance will depend on the religion’s doctrinal stability, moral authority, etc.
- 15 These indices are similar in concept to the Systems of Belief Inventory (Holland et al., 1998) or components thereof, and to related indices or components thereof, such as the Spirituality Index of Well-being (Daaleman, Frey, Wallace, & Studentski, 2002).
- 16 We have chosen to model spirituality very simply although our Scriptural motivations suggest a more nuanced idea of what leads to spiritual fulfillment. Thus, it is possible that for low levels of spiritual activity the return is negative and only through perseverance will one achieve positive returns from his efforts. See *Interior Castle* (St. Teresa of Avila, 1972) and *The Cloud of Unknowing* (Anonymous, 1996), where the difficulties of spiritual growth through contemplative prayer are explained. Or, it may be the case that spiritual returns are increasing

at levels of time and donations below \hat{t}^s, \bar{s} and decreasing thereafter, suggesting that the spiritual cannot fully supplant the material: having an abundant life also requires physical well-being in the here and now. Analyzing these extensions is straightforward and our results continue to hold for interior equilibrium configurations.

- 17 The anonymous author of the *Cloud of Unknowing* warns his pupils that “this work [contemplative prayer] demands a relaxed, healthy, and vigorous disposition of both body and spirit.” (Anonymous, 1996, p. 101).
- 18 Members of religious communities, such as the Trappists and Benedictines, have been shown to have lower mortality risk than the general population (de Gouw, Westendorp, Kunst, Mackenbach, & Vandenbroucke, 1995). Further, empirical studies show that communal aspects of religious observance are critical to one’s health and longevity. See for example, Powell et al. (2003). Yet, as Kark et al. (1996) show, community without religion is not enough.
- 19 See de Graaf (2003), Hochschild (1997), and Schor (1992).
- 20 That individuals gauge their happiness not by what they have, per se, but rather by how what they have compares with what their peers have, the so-called Veblen effects, have been studied by Bowles and Park (2005), Frey and Stutzer (2002), Clark and Oswald (1998), Sen (1983), and Easterlin (2001), among others, and empirical evidence for social comparison based preferences has been found by Blanchflower and Oswald (2004). See Frank (1997) and Clark and Oswald (1996) for summaries of the empirical literature. We represent the comparison consumption and leisure activities as social norms. Alternatively, we can interpret our well-being function as a utility function defined over own actions, other’s actions, and one’s identity, as described in Akerlof and Kranton (2000). In this interpretation one’s identity depends on one’s religiosity which is one’s assigned or chosen social category, the g ’s are one’s own characteristics relative to the ideal for one’s category, and the μ , γ , λ , and ζ parameters measure the benefit to that identity (the benefit of being a member of a religious community), and so summarize the effects of other’s actions upon you.
- 21 For example, Sherman argues that by “[A]cting on our allegiance to the Lord of the Sabbath, we are both allowed and obliged to say no to those ceaselessly encroaching activities that would rob us of the peace that God’s time grants us.” (Sherman, 2005, p. 50).
- 22 While market labor supply is not inelastic, at the level of the individual the decision usually concerns labor force participation, rather than marginal adjustments to time spent at work, over which individuals have less control (see, e.g., Blundell & Macurdy, 1999, and especially Blundell, Chiappori, Magnac, & Meghir 2007).

- 23 That is, medical goods are nominally priced at p^m , yet, provided these expenditures are tax-deductible, they affect the budget constraint only at a rate of $(1-\tau)p^m$; the same applies to charitable donations p^s .
- 24 It is, perhaps, theologically misleading to say that there are some who are more spiritual than others, rather, there are those who are more receptive to the overture of God, the Word of God in its broadest sense. This is at the heart of the theology of grace as was classically explored by Augustine in his *Confessions*.
- 25 Although we do not endogenize this link, DeLeire et al. (2007) do.
- 26 On this distinction see, e.g., Jacobs (2001).
- 27 This could be accomplished by allowing the poor to deduct their donations to charitable organizations even though they do not itemize, or by giving them a tax credit.
- 28 This market/relative price effect was suggested to us by an anonymous referee.

References

- Akerlof, G. A., & Kranton, R. E. (2000). Economics and identity. *Quarterly Journal of Economics*, 115, 715–753.
- Anonymous. (1996). *The cloud of unknowing* (W. Johnston, Ed.). Garden City, NY: Image Books.
- Antonovsky, A. (1979). *Health, stress, and coping: New perspectives on mental and physical well-being*. San Francisco: Jossey-Bass.
- Antonovsky, A. (1987). *Unraveling the mystery of health: How people manage stress and stay well*. San Francisco: Jossey-Bass.
- Bednarek, H. L., Jeitschko, T. D., & Pecchenino, R. A. (2006). Gluttony and sloth: Symptoms of trouble or signs of bliss—A theory of choice in the presence of behavioral adjustment costs. *Contributions to Economic Analysis & Policy* 5(1).
- Black, D. W. (2001). Compulsive buying disorder: Definition, assessment, epidemiology, and clinical management: Therapy in practice. *CNS Drugs*, 15, 17–27.
- Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics*, 88, 1359–1386.
- Blundell, R. W., Chiappori, P. A., Magnac, T., & Meghir, C. (2007). Collective labor supply: Heterogeneity and non-participation. *Review of Economic Studies*, 74, 417–445.
- Blundell, R. W., & Macurdy, T. (1999). Labor supply: A review of alternative approaches. In O. Ashenfelter & D. Card (Eds.), *Handbook of Labor Economics* (Vol. 3). 1560–1695.
- Bowles, S., & Park, Y. (2005). Emulation, inequality, and work hours: Was Thorsten Veblen right? *Economic Journal* 115, F397–F412.

- Clark, A. E., & Oswald, A. J.** (1996). Satisfaction and comparison income. *Journal of Public Economics*, *61*, 359–381.
- Clark, A. E., & Oswald, A. J.** (1998). Comparison-concave utility and following behavior in social and economic settings. *Journal of Public Economics*, *70*, 133–155.
- Cohen, A. B.** (2002). The importance of spirituality in well-being for Jews and Christians. *Journal of Happiness Studies*, *3*, 287–310.
- DeLeire, T., Jeitschko, T. D., O’Connell, S., & Pecchenino, R. A.** (2007). *Love thy neighbor as thyself: Community formation and the Church* (Michigan State University Department of Economics Working Paper). Lansing, MI.
- DeVido, J.** (2003). Contemplative continuity: Conceptions of health and illness in a Trappist abbey. In S. Saved (Ed.), *Religious healing in Boston: Reports from the field*. Boston: Center for the Study of World Religions.
- Daaleman, T. P., Frey, B. B., Wallace, D., & Studenstski, S. A.** (2002). The spirituality index of well-being: Development and testing of a new measure, *Journal of Family Practice*, *51*(11).
- Dallman, M. F., Pecoraro, N., Akana, S. F., la Fleur, S. E., Gomez, F., Houshyar, H., et al.** (2003). Chronic stress and obesity: A new view of “comfort food.” *Proceedings of the National Academy of Sciences of the United States of America*, *100*, 11696–11701.
- Dittmar, H.** (2005). Compulsive buying—a growing concern? An examination of gender, age, and endorsement of materialistic values as predictors. *British Journal of Psychology*, *96*, 467–491.
- Driscoll, J. J.** (2002). And the nominees are...spiritual care, pastoral care. *Vision 12*.
- Driscoll, J. J.** (2003). HIPPA calling the question: Is the chaplain a health care professional? *Vision 13*.
- Easterlin, R. A.** (2001). Income and happiness: Towards a unified theory. *Economic Journal*, *111*, 465–484.
- Economist*. (2005, February 19). Episcopalians at sea: God help them. 30.
- Ellison, C. G.** (1991). Religious involvement and subjective well-being. *Journal of Health and Social Behavior*, *32*, 80–99.
- Falk, A., & Knell, M.** (2004). Choosing the Joneses: Endogenous goals and reference standards. *Scandinavian Journal of Economics*, *106*, 417–35.
- Ferriss, A. L.** (2002). Religion and the quality of life. *Journal of Happiness Studies*, *3*, 199–215.
- Frank, R. H.** (1997). The frame of reference as a public good. *The Economic Journal*, *107*, 1832–1847.
- Frankena, W.** (1973). *Ethics* (2nd Ed.). Englewood Cliffs, N.J.: Prentice Hall.

- Freud, S.** ([1907] 1962). Obsessive acts and religious practices. In *Standard edition of the complete psychological works of Sigmund Freud* (J. Strachey, Ed., Trans.). London: Hogarth Press.
- Frey, B., & Stutzer, A.** (2002). *Happiness & economics: How the economy and institutions affect human well-being*. Princeton: Princeton University Press.
- Fuchs, V. R.** (2004). Reflections on the socio-economic correlates of health. *Journal of Health Economics*, 23, 653–661.
- Fukuyama, F.** (2000). *Social capital and civil society* (IMF Working Paper 00/74). Washington, DC: IMF.
- George, L. K., Larson, D. B., Koenig, H. G., & McCullough, M. E.** (2000). Spirituality and health: What we know, what we need to know. *Journal of Social and Clinical Psychology*, 19, 102–116.
- Goldhaber, M.** (2003). With strength of body and spirit: Perspectives on healing in the Ukrainian community. In S. Saved (Ed.), *Religious healing in Boston: Reports from the field*. Boston: Center for the Study of World Religions.
- De Gouw, H. W. F. M., Westendorp, R. G. J., Kunst, A. E., Mackenbach, J. P., & Vandenbroucke, J. P.** (1995). Decreased mortality among contemplative monks in the Netherlands. *American Journal of Epidemiology*, 141, 771–75.
- De Graff, J.** (Ed.). (2003). *Take back your time: Fighting overwork and time poverty in America*. San Francisco: Berrett-Koehler.
- Grossman, M.** (1972a). On the concept of health capital and the demand for health. *Journal of Political Economy*, 80, 233–255.
- Grossman, M.** (1972b). *The demand for health: A theoretical and empirical investigation*. New York: Columbia University Press.
- Grossman, M.** (2000). The human capital model. In A. J. Culyer & J.P. Newhouse (Eds.), *Handbook of health economics* (Vol. 1A). Amsterdam: Elsevier.
- Gruber, J.** (2005). Religious market structure, religious participation, and outcomes: Is religion good for you? *Advances in Economic Analysis & Policy*, 5.
- Hackney, C. H., & Sanders, G.S.** (2003). Religiosity and mental health: A meta-analysis of recent studies. *Journal for the Scientific Study of Religion*, 42, 43–55.
- Helliwell, J. F., & Putnam, R. D.** (1999). *Education and social capital* (NBER Working Paper 7121). Cambridge, MA.
- Hochschild, A. R.** (1997). *The time bind: When work becomes home and home becomes work*. New York: Henry Holt.
- Holland, J. C., Kash, K. M., Passik, S., Gronert, M. K., Sison, A., Lederberg, M., et al.** (1998). A brief spiritual beliefs inventory for use in quality of life research in life-threatening illness. *Psycho-Oncology*, 7(6), 460–469.

- van der Horst, L.** (1955). Mental health and religion: Whenever man's life is estranged from God in all its manifestation, and develops without religion and morality, there are grave dangers for mental health. *Pastoral Psychology*, 6(1), 15–21.
- Hungerman, D. M.** (2004). *Are church and state substitutes? Evidence from the 1996 Welfare Reform* (Duke University Working Paper). Durham, NC.
- Iannaccone, L. R.** (1998). Introduction to the economics of religion. *Journal of Economic Literature*, 36, 1465–1495.
- Iannaccone, L. R., Finke, R., & Stark, R.** (1997). Deregulating religion: The economics of church and state. *Economic Inquiry*, 35, 350–64.
- Jacobs, C.** (2001). *Macht glaube gesund? Öffentliche vorlesung and der theologischen fakultät Paderborn* (Working Paper). From <http://www.cjacobs.de/>.
- Jung, C.** (1933). *Modern man in search of soul*. New York: Harcourt, Brace, Jovanovich.
- Kark, J. D., Shemi, G., Friedlander, Y., Martin, O., Manor, O., & Blondheim, S. H.** (1996). Does religious observance promote health? Mortality in secular vs. religious kibbutzim in Israel. *American Journal of Public Health*, 86, 341–46.
- Koenig, H. G., McCullough, M. E., & Larson, D. B.** (2001). *Handbook of religion and health*. Oxford: Oxford University Press.
- Marmion, D.** (1998). *The spirituality of everyday faith: A theological investigation of the notion of spirituality in Karl Rahner*. Louvain: Peeters Press.
- Miller, W. R., & Thoresen, C.E.** (2003). Spirituality, religion, and health: An emerging research field. *American Psychologist*, 58, 24–35.
- Oswald, A. J.** (1997). Happiness and economic performance. *Economic Journal*, 107, 1815–31.
- Pecchenino, R. A.** (forthcoming). Becoming: Identity and spirituality, *Journal of Socio-Economics*.
- Post, J. E.** (2003, February 14). The Catholic Church confronts its future. *National Catholic Reporter Online*.
- Powell, L. H., Shahabi, L., & Thoresen, C. E.** (2003). Religion and spirituality: Linkages to physical health. *American Psychologist*, 58, 36–52.
- Putnam, R. D.** (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster.
- St. Augustine** (1961). *Confessions*. London: Penguin Books.
- St. Theresa of Avila** (1972). *Interior castle* (A. Peers, Trans.). Garden City, NY: Image Books.
- Schneiders, S.** (1986). Theology and spirituality: Strangers, rivals, or partners? *Horizons*, 13, 253–74.

- Schor, J. B.** (1992). *The overworked American: The unexpected decline of leisure*. New York: Basic Books.
- Sen, A.** (1983). Poor, relatively speaking. *Oxford Economic Papers, New Series*, 35, 153–169.
- Sherman, R.** (2005). Reclaimed by Sabbath rest. *Interpretation: A Journal of Bible and Theology*, 9, 38–50.
- Snowdon, D.** (2001). *Aging with grace: The nun study and the science of old age*, London: The Fourth Estate.
- Stark, R., & Finke, R.** (2000). *Acts of faith: Explaining the human side of religion*. Berkeley, CA: University of California Press.
- Swinyard, W. R., Kau, A-K., & Phua, H-Y.** (2001). Happiness, materialism, and religious experience in the US and Singapore. *Journal of Happiness Studies*, 2, 13–32. ■