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ARTICLES

BOOK REVIEWS

FREE RIDING, MARKET STRUCTURE, AND CHURCH MEMBER DONATIONS IN SOUTH CAROLINA*

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The research literature on factors influencing member donations to churches is extensive. This paper uses unique data from South Carolina Baptist congregations to confirm much of the research, particularly including the potential for free-riding by members, but also extends that research by exploring the differential effect on donations of competition among *Baptist congregations and* between *Baptist and non-Baptist congregations. We employ hierarchical linear modeling, rarely used in religious research but particularly well suited to the data, some of which is by congregation and some of which is by county. Previous empirical and theoretical work offers contradictory conclusions. We review the theory, clarifying some issues. Our results confirm that free riding increases as congregations grow larger, an effect mitigated by the increasing level of services offered as congregations grow. Importantly, competition between Baptist congregations reduces and competition with non-Baptist congregations increases per member donations.*

The research on factors influencing member donations to churches is extensive. This paper uses unique data from South Carolina Baptists congregations to confirm much of the research, particularly including the potential for free-riding by members. In other words, this paper incorporates as causal factors important internal member characteristics and motivations that are the focus of previous research, especially the potential temptation by members to free-ride on other member contributions. Importantly, it also extends previous research by exploring the differential effect on donations of competition *among* Baptist congregations and competition *between* Baptist and non-Baptist congregations. That is, this paper examines the effects of external market structure and competitive pressure on donations. By focusing on the differential effect of Baptist and non-Baptist competition, we address a largely unexplored issue, acknowledged by Chaves and Gorski, "that there probably is more competition among congregations *within* denominations than there is *across* denominations" (2001:77). As an additional contribution, this paper employs hierarchical linear modeling, rarely used in religious research but particularly well suited to the data, some of which is compiled by congregation and some by county.

A significant body of research shows that member donations to churches are positively affected by such internal factors as member income, intensity of belief, and commitment or involvement in the particular church (Davidson and Pyle 1994; Finke, Bahr, and Scheitle 2006; Hoge 1994; Hoge and Yang 1994). Member donations are also positively affected by internal factors including age, education, doctrinal strictness, conservatism, and congregational stewardship programs including pledge systems (Inskeep 1994; Luidens

and Nemeth 1994; Olson and Perl 2005; Smith and Everson 2008; Zaleski, Zech, and Hoge 1994). This important body of research tends to yield similar statistical results, results also consistent with theory. Researchers have found less common ground exploring the possibility that donations are negatively affected by the number of congregation members—the free rider problem. Given the disagreement, a more detailed examination of the issue is appropriate.

THE FREE RIDER PROBLEM

The effect the number of congregation members has on individual donations is a complex issue, although theory tends to suggest an inverse relationship. The potential for free riding by church members was first analyzed by Wallis (1991). Churches produce products that have public goods characteristics to a greater or lesser extent. Church doctrine itself, for example, typically is a public good that is available without cost or restriction even to non-believers. Church gatherings—Christian or Jewish Saturday or Sunday services, Muslim prayer services—provide collective benefits to all attendees and typically involve no entry fee. For such goods as these, members are tempted to avoid contributing.

Free riding is also a potential problem to the extent church members provide one another valuable services for free. Here an obvious temptation exists for an individual to solicit valuable services from other members but not reciprocate. A free rider can also exploit whatever social network or personal attribute signaling church membership provides, diluting the value to others of those same goods.

The notion that some kinds of organization face free rider problems predates its application to religion, of course. Olson (1965) first raised the issue of public goods produced by groups. Sandler and Tschirhart (1980) and Cornes and Sandler (1986) provide overviews of the literature, which makes the general prediction that total voluntary donations to organizations providing significant public goods will grow as the organization's membership grows, but individual voluntary donations will shrink, holding other factors constant. This same literature suggests a key strategy to mitigate the free rider problem is for the organization to provide unique and valuable private goods jointly with the public good, a strategy most effective when the organization has a monopoly on the private good or when the private good cannot be provided separately from the public good (Sandler 1992).

As well as providing valuable private goods jointly with collective religious goods, churches have at one time or another pursued several other strategies to mitigate the free rider problem. One oft-used technique is establishment: the church is funded by the state through involuntary taxation. In some nations, formerly in Scandinavian nations for example, established church membership was automatic at birth. While assuring financial security, established churches often suffer from low levels of member commitment, free riding in another guise, as Adam Smith (1979 [1784]) first noted about England's established church. Hamberg and Pettersson (1994) confirm the result for contemporary Sweden, although this result is not without challenge (Bruce 2000).

Church doctrine itself often addresses the potential for free riding with coercion. That is, church doctrine mandates donations of time or money to the church or on behalf of the church. These behavior standards are enforced by a method unique to religion: reward or punishment in the afterlife. What is more, monitoring is perfect. God is watching each member all the time. The key disadvantage to this strategy is that enforcement is only effective at reducing free riding by those who believe in that portion of the church's doctrine.

Of course, another strategy is simply to exclude free riders. Wallis (1991), for example, suggests that what he terms "exclusive" churches pursue this strategy, while "inclusive" churches accept the burden of free riders. Exclusion as a strategy is not without problems. Free riders must be identified, not always an easy task, especially for larger churches, and especially while at the same time avoiding excluding "cheap riders," those who make positive but modest contributions. A related strategy would be for a church to employ multiple smaller congregations, within which free riders can more easily be identified, implying a possible limit on the optimal size of congregations within a denomination.

In a seminal paper, Iannaccone (1992) describes how the strategies of sacrifice and stigma can reduce the free rider problem. Here members are required to engage in some costly behavior, behavior that is unusual and unique to the church's members. An example of the latter is a requirement that members dress in unique clothing. Sacrifice and stigma serve as both selection devices and signaling devices. The high cost (sacrifice and stigma) of membership discourages free riders, and the unusual behavior singles out members for easy identification by members and non-members in the larger community. While sacrifice and stigma are effective, they tend to work best for smaller groups, such as cults. The high cost of membership tends to limit membership potential. In addition, if membership increases sufficiently, unusual behavior or dress ceases to stigmatize.

Regardless of the strategy churches might employ to reduce free riding, the weight of theory still suggests the degree of a free-rider problem will be inversely related to the number of church members. However, at least two factors mitigate the negative effect of free riders on a larger church's ability to prosper financially. First, larger churches might have lower per member cost because of economies of scale (Stonebraker 1993). If so, free riders are a less significant burden for larger churches. Second, the larger number of members might in itself be valuable. Each member gains from others' membership. Iannaccone (1992) terms this effect "participatory crowding." More generally, this is an example of a network externality, a concept Liebowitz and Margolis review (1994). Because an increase in the value of a collective good increases the tendency of individuals to provide support for the collective good, larger churches might expect more support from members to the extent membership creates a network externality.

In summary, a review of the theory of the free rider problem as it relates to churches yields mixed results. Churches face a free rider problem to the extent church goods are purely collective. However, churches have available several tools to reduce free riding, including jointly providing unique valuable non-collective products, establishment, coercion, and sacrifice and stigma. In addition, the free rider problem is potentially mitigated by economies of scale and by the presence of a network externality in membership.

Perhaps not surprisingly, the empirical research on the subject offers mixed results. In support of the free rider problem, Hoge *et al.* (1996) find a weak inverse relationship between denomination size and donations per member. They also note that members of local congregations tend not to make donations to their associated national churches and national church initiatives. Similarly Zaleski and Zech (1992) find that larger congregations receive lower per-member donations. By contrast, Lipford (1995) finds no evidence of a free rider effect on member donations based on extensive data from three Protestant denominations, although these results are not free of criticism (Tullock 1996; Zaleski and Zech 1996).

RELIGIOUS COMPETITION

Economists and sociologists of religion have for some time studied the relationship between religious market structure and measures of church membership and intensity of belief. Two major competing lines of argument have emerged. The first follows from the sociology literature on secularization, arguing that increases in denominational variety or pluralism fracture the religious landscape and weaken churches (Breault 1989a, 1989b). By contrast, the "rational choice" or "supply-side" model of religion argues that unregulated competing churches are compelled by market forces to mobilize their members, members who are motivated by preferences for religious goods that are similar in significant ways to ordinary goods (Stark and Finke 2000). To prosper in a competing religious market, churches must evangelize and offer a mix of religious products that appeal to members. Consequently, a pluralistic religious environment generates higher levels of commitment from a larger total number of members than occurs in a monopolistic religious market.

Researchers focus on at least three reasons for the success of a pluralistic religious market: absence of the government regulation that often enforces an inefficient monopoly religious market, evangelistic effort required for success in a competing religious market, and the increased market penetration due to increased religious product variety in a competitive religious market.

The first and second reasons follow Adams Smith's analysis of the established Church of England's failure to motivate members, especially when compared to such "upstart sects" as the Methodists, whose clergy were compelled to be attractive to potential members in order to survive. Sociologists Finke and Stark have published a substantial body of research contrasting regulated monopoly religious markets (established churches) with unregulated competing religious markets (Finke 1997; Finke and Stark 1992). Iannaccone (1991) uses data across Protestant western countries to support this view. Other contributors, especially to the regulation versus competition argument, include Chaves and Cann (1992), Iannaccone, Finke, and Stark (1997), and the aforementioned Hamberg and Pettersson (1994). Iannaccone also contributes an excellent comprehensive review of the literature (1998). In related work, Olson (2008) and Hill and Olson (2009) look at factors affecting small versus large congregations, concluding that the higher turnover in smaller churches means members are more committed to the congregation.

The debate between these various camps has been heated at times, often centering on questions about the reliability of data and interpretation of historical religious behavior (Bruce 1992, 1995a, 1995b, 2000; Chaves and Cann 1992; Hoge 1996; Finke and Stark 1989; Olson and Hadaway 1999; Phillips 1999; Stark and Iannaccone 1994). Sorting through these arguments, even in cases where writers claim to disagree, a consensus emerges that government establishment of a monopoly religion (over time) results in a church much less able to attract committed members than in an unregulated religious market, although Hull and Moran (1999) present an example of successful establishment in colonial New England.

On the other hand, disagreement remains about the role product variety plays in a religious market separate from any government regulation. That is, does religious product variety increase total church membership and commitment? Given that economists have examined market behavior for the last two hundred years, an obvious route to a solution would be to appeal to economic theory and to argue that religious markets are like ordinary markets. If so, we need only examine the economic theory of product variety to predict behavior in religious markets.

Unfortunately, there is no unambiguous answer to this question in the economics literature on product variety. Most of that literature examines issues not relevant here. The pioneering work on product variety by Mead (1974) and Spence (1976), for example, tries to determine whether competitive markets produce the optimal variety of products, not the effect of product variety on total market penetration. Standard texts in industrial organization devote significant time to the study of product differentiation, especially its close relationship to advertising (Waldman and Jensen 2001), but also draw no firm conclusions. Competition can produce valuable product variety, but

> variety is not always a good thing. Wholly apart from the cost savings attainable through longer production runs, there are cases in which standardization serves consumers better than diversity. The adoption of common technical standards for records and compact discs, so that any product can be played on any manufacturer's audio equipment, is one example. (Scherer and Ross 1990).

The possibility consumers prefer some degree of standardization rather than preferring unconstrained product variety is a more recent addition to the economics literature; work by Church and Gandal (1992) and Besen and Farrell (1994) are examples. Here again, the models tend to focus on the optimal degree of product standardization and product variety rather than predicting market penetration. Nevertheless, the notion that in some cases consumers prefer competition among standardized products offers an insight that might be useful in studying religion. As Hull and Bold (1998) show, consumers of religion, like consumers in many ordinary markets, might find religious product variety appealing so long as that variety is constrained within a standardized doctrinal framework such as the Ten Commandments. A classic example in ordinary markets is personal computers, whose sales expanded dramatically only after introduction of the IBM PC's standardized open architecture, which was copied by what became a large number of competing manufacturers.

Even Stark, a proponent of the theory that religious diversity leads to greater total church membership, acknowledges that a monopoly religion can be valuable to individuals in some cases (Stark and Bainbridge 1987:95) and that too much religious diversity can hurt religion in general:

> it seems to me that by the first century the empire had developed *excessive* pluralism— . . . faced with this array, people are likely to have been somewhat overwhelmed by their options and therefore to have been somewhat unwilling to stake very much on any given cult" (Stark 1996:197).

Consistent with this possibility, Hull and Bold (1998) find an inverse relationship between church membership and denominational variety using ecological data from U.S. counties. In apparent contrast, Zaleski and Zech (1995) find a positive relationship between church member donations and denominational variety using data from a number of Protestant and Catholic congregations.

Importantly, however, most of this substantial literature focuses on the relationship between market structure and total membership (or member commitment), not on the relationship between market structure and member giving. While there is doubtless a connection between commitment and giving, the link between market structure and giving is

implied but rarely studied directly. Further, the literature also does not address directly the effect of competition between producers of similar versus dissimilar products.

SOUTH CAROLINA BAPTIST CONGREGATIONS

These questions about free riding and market structure make an available set of data about Baptist churches in South Carolina very useful. The South Carolina Baptist Convention *2001 Annual Report* includes membership and budget data for 1,982 congregations, virtually all of the Baptist congregations in the state. The report also includes for each congregation Sunday school attendance and membership in selected special programs.

Here we can analyze a relatively small, standardized religious market. Baptist churches dominate South Carolina's religious market. Roughly 2,000 of 5,522 congregations, representing well over half of total church members in South Carolina, call themselves Baptist. Most of these are members of the Southern Baptist Convention. Especially important for our purpose, the Southern Baptist Convention is not a centralized organization. Membership in the Convention by congregations is voluntary. Individual congregations have a fair amount of latitude about doctrinal detail and complete latitude about associated programs. In addition, a central authority does not restrict the entry of potential members. Thus, South Carolina's churches compete in an unrestricted religious market with a significant amount of doctrinal standardization across at least the Baptist congregations.

The religious market in South Carolina is not homogeneous across the state, however. Significant variation in Baptist and non-Baptist market share exists across South Caroli-

TABLE 1

Descriptive Statistics for South Carolina Counties

(N = 46)

	Minimum	Maximum	Mean
NUMBER OF BAPTIST CONGREGATIONS	5	176	42.9
NUMBER OF NON-BAPTIST CONGREGATIONS	10	267	75.3
NUMBER OF ALL CONGREGATIONS	18	449	91.7
PERCENT OF BAPTIST CONGREGATIONS	**16.7%**	**64.9%**	**40.2%**
TOTAL ADHERENTS, ALL CONGREGATIONS	2702	217660	75213.2
COUNTY POPULATION IN 2000	9958	379616	146626.2
ADHERENTS PER 1000 POPULATION	**270.5**	**660.6**	**499.4**

na's forty-six counties, for example, as does the extent of church market penetration. As Table 1 shows, Baptist congregations in a county represent a maximum of almost 65% and a minimum of 17% of total county congregations. A maximum of 661 per thousand people and a minimum of 271 people per thousand are members of any church in a county.

Significant variation also exists among Baptist congregations throughout the state. The reported congregation membership varies from 6 to 5,940. Total reported congregation receipts varied from zero to almost seven million dollars. Minimum receipts per member were again zero and maximum receipts per member almost four thousand dollars. The reason why some congregations report zero members or report zero receipts could not be determined. Since this might be a reporting issue, these congregations are omitted from the subsequent regression analysis.

TABLE 2

Descriptive Statistics for South Carolina Baptist Congregations

(N = 1,830)

	Minimum	Maximum	Mean
TOTAL CONGREGATIONS MEMBERS	6	5940	403.1
TOTAL CONGREGATIONS RECEIPTS ($)	0.00	6,739,523.00	259,334.14
RECEIPTS PER MEMBER ($)	0.00	3,986.99	579.78

HIERARCHICAL LINEAR MODEL

The South Carolina annual report data, plus additional data from government sources, allows us to construct a regression equation with congregational donations per member as the dependent variable. Independent variables include total congregation members, enrollment in congregation activities, median per capita personal income in the congregation's county, number of Baptist congregations in the county, and number of non-Baptist congregation's in the county. The coefficient on total congregation members should capture the free-rider effect, and the consensus of research suggests it should be positive. Enrollment in activities is the total of enrollment in five possible congregation official activities: Sunday school, Disciplineship Training classes, Music Ministry, Woman's Missionary Union missions education, and Men's Ministries leadership training. This variable serves as a proxy for valuable associated products provided to a congregation, and its coefficient should be positive, thus at least partially offsetting losses from free riders. Based on previous research, per capita personal income should affect per member donations positively. The number of Baptist and non-Baptist congregations are measures of two types of competition: the number of Baptist congregations measuring competition from similar products and the number of non-Baptist congregations measuring competition from different or "non-standardized" products. Note here that the number of Baptist congregations includes only members of the South Carolina Baptist Convention. Breakaway Baptist congregations are

counted as non-Baptist. This is an artifact of the data, but is consistent to the extent breakaway congregations adopt doctrine significantly different from Convention member congregations. Regardless, since virtually all Baptist congregations are members of the Convention, inclusion or exclusion of breakaways should have little effect on the results.

Because of potential reporting issues, we exclude congregations with fewer than twenty-five members and congregations with zero total donations. Additional observations have missing data, leaving 1,770 observations in the sample.

Although seventeen hundred or so congregations are represented in the regression data, most of the independent variables are by county, and South Carolina only has forty-six counties, reducing the real variation in the independent variables. That is, some of the data are hierarchical: donations depend in part on county characteristics, which in turn are influenced by several county-level independent variables.

Hierarchical linear modeling (HLM), also labeled multi-level analysis, is an extension of ordinary least squares regression analysis. Hierarchical linear modeling allows variation in a dependent variable to be analyzed at multiple hierarchical levels, rather than in a single level as with ordinary least squares. Like ordinary least squares, in HLM, a dependent variable is influenced by several independent variables. However, unlike ordinarily least squares, some observations of the dependent variable share a common value for two or more of the independent variables. These observations of the dependent variable are grouped; they are part of a hierarchy. For the South Carolina data, donations are influenced by income, for example, but income is only available by county. Thus some of the observations of per member donations share a common value for income, since they come from a given county. HLM overcomes the fact that such hierarchical data violates the requirement in ordinary least squares that error terms be independent.

In this paper, the hierarchical model takes the following form:

$$
\begin{aligned}
Y_{ic} = {} & \beta_0 + \beta_1 \text{ Total Congregation Members (level one, congregation variable)} \\
& + \beta_2 \text{ Activity Enrollment (level one, congregation variable)} \\
& + \beta_3 \text{ Personal Income (level two, county variable)} \\
& + \beta_4 \text{ Baptist Congregations (level two, county variable)} \\
& + \beta_5 \text{ Non-Baptist Congregations (level two, county variable)} \\
& + b_{0i} + \varepsilon_{ic}
\end{aligned}
$$

Where:

- Y_{ic} is donations per member in county i and congregation c
- β_0 is the overall average intercept
- β is a slope coefficients on an independent variable
- b_{0i} is the intercept for the equation on county i
- ε_{ic} is the error for county i and congregation c

Note: $b_{0i} \sim N(0,\sigma^2_{b0i})$ and $\varepsilon_{ic} \sim N(0,\sigma^2)$

The coefficients on the independent variables in this hierarchical model have the same interpretation as in ordinary least squares. Because some of the independent variables are hierarchical, the slope terms are calculated across congregations and also by county. In

other words, the model calculates least squares regression estimates for the independent variables within each county where the slopes terms or coefficients are assumed to be identical across counties. The model then calculates a separate intercept term (b_{0i}) for each county's regression. Imagine a set of parallel regression lines, one for each county, where the intercept for each county differs because of the level two county variables. β_0 is the overall average intercept for all counties. The reasoning is quite similar to that used when dummy variables are included in ordinary least squares regressions. The coefficients on dummy variables cause the regression line to shift up or down. Table 3 summarizes the results.

TABLE 3

Hierarchical Regression Analysis of Per Member Donations

(N = 1,770, excludes congregations with fewer than twenty-five members and zero donations)

	Unstandardized Coefficients	t	Sig.
Constant	344.4	4.51	.000
ACTIVITY ENROLLMENT	0.26	12.49	.000
PERSONAL INCOME	0.008	2.09	.042
TOTAL CONGREGATION MEMBERS	**-.227**	**-7.82**	**.000**
BAPTIST CONGREGATIONS	**-.907**	**-2.83**	**.011**
NON-BAPTIST CONGREGATIONS	**0.816**	**2.78**	**.009**
Dependent Variable: PER MEMBER GIVING			

The regression results are in part expected and in part intriguing. As should be expected, congregation members donate more to congregations with larger enrollments in special programs. Members of congregations with such programs donate 26¢ for each person enrolled in those programs. Also expected, increases in member income lead to increases in donations, albeit modest ones. Members donate about a penny more for every dollar increase in county personal income per capita.

The regression results support the presence of a free rider problem. As the number of members increases, donations per member fall. Each new member reduces per member donations by about 23¢. This result is consistent with Finke's (1994) overview of changes in the Southern Baptist Convention in recent years. However, since relatively large congregations remain viable, congregations might be experiencing economies of scale and so

have lower costs per member. Larger congregations also have more and larger additional programs, increasing the value of a large congregation to its members. Large congregations might also benefit from network externalities. The data do not allow us to distinguish these possible effects.

The intriguing results are for the effect of additional congregations on donations to a given denomination. As the number of other Baptist congregations in a county increases, donations per member to a given Baptist congregation fall. By contrast, as the number of non-Baptist congregations in a county increases, donations to a given Baptist congregation rise. Taking these results at face value, we would conclude that an increase in Baptist competition reduces member commitment and an increase in non-Baptist competition increases Baptist member commitment.

The problem with explaining variations in donations by variations in member commitment is that it lacks any connection to economic theory other than ascribing changes in member behavior to changes in tastes and preferences. At least as a starting point, we prefer to make the assumption that people's underlying preferences do not change. People's behavior changes, but does so because of a change in external circumstances, not because of a change in underlying preferences.

But if individual preferences are not changing, what explains the regression results? The second result, that non-Baptist congregations increase Baptist per-member donations, is easily explained. Consider a community that adds a second congregation different from the first existing congregation, representing a different denomination. The second congregation will attract some members of the first congregation and some individuals who were not members of any congregation. The members who leave the first congregation will be those least committed to it. As a result, the average level of religious commitment of the remaining members of the first congregation will increase even though the level of commitment of each member has not changed. What sort of members will the second denomination attract? It will first attract those individuals who find the first congregation to be least attractive and the second congregation most attractive. Combined, average measured level of religious commitment in the community with two congregations will be higher than average commitment in a community with one congregation, even though underlying individual preferences have not changed. Research by Stoll and Petersen (2008) is consistent here as is work by Olson (2008) and Hill and Olson (2009). Obviously an additional necessary (and reasonable) assumption to deal with our South Carolina data is that member commitment and donations are positively correlated.

What about the effect of additional Baptist congregations on member donations? What seems reasonable to us is that non-Baptist congregations compete mainly by such product characteristics as doctrine, rather than mainly by price. By contrast, Baptist congregations, given they have such similar doctrinal characteristics, mainly compete by price (especially since entry is not restricted). That is, they attract members by making membership easier. If so, an increase in the number of Baptist congregations will result in lower per member donations. This would explain the first regression result.

Another possible explanation is an extension of the free rider problem from one congregation in an area to all congregations in an area. As the number of Baptist congregations increases, the total number of Baptist members increases. Because the total number of Baptist members has increased, the free rider problem causes donations per Baptist member to fall. Again, our data do not allow us to determine the exact effect.

POTENTIAL PROBLEMS

The regression results are not without potential problems. Multicollinearity exists between the number of Baptist and non-Baptist congregations in a county. More populous counties have more of all types of congregations. Multicollinearity might be an issue with other variables as well. However, a review of multicollinearity diagnostics not shown here reveals no critical problems. In addition, the key regression results are robust to different selections of independent variables. Results also were not affected when the specification included non-linear regression with membership squared as an independent variable.

As with any regression equation, our choice of independent variables might be questioned. For example, our measure of competition is a simple count of denominations in a county. Might a better measure be some sort of concentration ratio where larger competing churches have a stronger weight in the equation? We believe competition even from very small congregations can be significant and so prefer our measure. In the market for personal computers, for example, Apple surely has a significant effect on the behavior both of Microsoft and the manufacturers of personal computers even though Apple's personal computer market share is only about 5%. In the religious marketplace, surely there are examples of relatively small congregations generating significant attention in a region. Regardless, we ran regressions using a Herfindahl index as a measure of competition and the results did not differ meaningfully from those shown here.

Competition for member donations might come from outside the religious market entirely. Certainly individuals face innumerable alternative uses for income. Our regression equation does not capture this form of competition. A potential, albeit not entirely satisfactory, proxy for non-religious competition might be county population. Population would represent available alternatives to church attendance. However, regression results were unaffected when county population was included and the explanatory value of the equation did not improve.

An additional potential problem is that the regressions rely in part on county church membership data gathered by the Glenmary Research Center in its *Religious Congregations & Membership in the United States 2000* report. Finke and Scheitle (2005) point out that the Glenmary data underreport both the number of congregations and church membership, particularly for historically African-American congregations. By including these congregations, they suggest total church membership in South Carolina is actually close to 66% rather than Glenmary's 48% estimate. Finke and Scheilt calculate adjustment factors for each state and suggest these could be used to make adjustments for each county's total membership. They do not suggest a technique to adjust the number of Baptist and non-Baptist *congregations*, however. Further, it is not clear to what extent the presence of historically African-American congregations affects behavior of members of congregations in the South Carolina Baptist Convention, who historically have been white.

Ordinary least squares regression results typically include a measure of explanatory value of the entire equation, such as the adjusted R-Square statistic, and a measure of the statistical significance of the equation, such as the equation's F statistic. One way to evaluate the hierarchical regression in this situation is to compare estimates of covariance from the full model with estimates of the covariance from a null version of the model where county is the only independent variable. These calculations are derived using data from Table 4.

TABLE 4: ESTIMATES OF COVARIANCE PARAMETERS, FULL AND NULL MODELS

Full Hierarchical Model:
All Independent Variables Including County

Parameter	Estimate	Standard Error
Residual	121410.8	4116.850776
Intercept Variance	28.222914	593.853996

Null Hierarchical Model:
County is only Independent Variable

Parameter	Estimate	Standard Error
Residual	134176.9	4557.042705
Intercept Variance	3306.686504	1512.888504

We can use variance estimates of the intercepts above to calculate the usefulness of the full model county intercept terms as follows:

(1 - (28.222914/3306.686504)) = 0.9915.

The full model explains about 99% of the between county variation (variation in intercept terms between county regressions). Although this seems impressive, additional analysis reveals there is little variation in the county intercept terms. Looking at the null model variance estimates and comparing intercept variance to total variance (the sum of residual and intercept variance) yields the following:

3306.686504/(3306.686504+134176.9) = 0.024

Thus only about 2.4% of the total variability is between counties when there are no predictors in the model. In other words, county intercept terms are not very different from one another. The full hierarchical model explains a large portion of the variation between county intercept terms, but county intercept terms vary little.

We can use the variance estimates of the residuals from the above table to calculate the usefulness of the full model regression slope coefficients as follows:

(1 - (121410.8/134176.9)) = 0.095

The full model explains about 9.5% of the within county variation. This is similar in concept to the R^2 in an ordinary least squares regression. The full model explains only a modest portion of the variation between congregations in counties, although the portion explained is statistically significant. As an aside, ordinary least squares regression with these data yielded very similar results.

CONCLUSION

Our unique set of data on eighteen hundred South Carolina Baptist congregations allows us to explore two issues: the importance of "free riding" in church membership and the roll of competition from Baptist and non-Baptist congregations in member donations. Previous empirical and theoretical work offers contradictory conclusions. We review the theory, clarifying some issues. Our empirical work is based on membership and donation data for the eighteen hundred Baptist congregations in the state. Results suggest free riding increases as congregations grow larger, an effect mitigated by the increasing level of services offered as congregations grow. Competition between Baptist congregations reduces per member donations, an appropriate conclusion if Baptist congregations compete by price. Competition with non-Baptist congregations increases per member donations, logical to the extent less-committed Baptist members are more likely to defect to the non-Baptist competitors.

NOTE

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APPENDIX
VARIABLE DESCRIPTIONS

PER MEMBER GIVING:	Total church receipts divided by total members. Calculated from *SCBC Annual.*
TOTAL MEMBERS:	Total number of members listed on membership roles. Includes members who no longer reside in the area. Source is *SCBC Annual.*
CHURCH ACTIVITY ENROLLMENT:	Total of enrollment in five possible congregation official activities: Sunday School, Disciplineship Training classes, Music Ministry, Woman's Missionary Union missions education, and Men's Ministries leadership training. Calculated from *SCBC Annual.*
PERSONAL INCOME:	Per capita median personal income by county. Source is *BEA.*
BAPTIST CONGREGATIONS:	Number of Baptist congregations in the county. Calculated from *SCBC Annual Report.*
NON-BAPTIST CONGREGATIONS:	Number of non-Baptist congregations in the county. Calculated from *Glenmary.*

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