

# Praying for a Recession: The Business Cycle and Protestant Religiosity in the United States

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**Abstract:** Some observers believe the business cycle influences religiosity. This possibility is explored in this paper by empirically examining the relationship between macroeconomic conditions and religious participation by U.S. Protestants. The findings of this paper suggest that there is a strong countercyclical component to religious participation in evangelical Protestant denominations while for mainline Protestants there is on balance a procyclical component to religious participation.

**Keywords:** Religiosity, Church Attendance, Business Cycle, Macroeconomic Conditions, Recession, Yield Curve, Protestant Church Growth.

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*"Adrian – you're not trying to tell me that you have personally organized a slide towards recession just to get Christianity back on its feet?" Adrian grinned [and said] "Not quite, no. But I've prayed mighty hard for it, and – well, I'm pretty impressed with the results so far."*  
--A conversation reported in *The Independent* during the 2001 recession.

## **I. Introduction**

The above quote suggests that religiosity is influenced by the business cycle, a view shared by many religious leaders (Vitello, 2008). Despite these anecdotal musings, very few attempts have been made to empirically assess whether the business cycle does, in fact, systematically affect religiosity. There are reasons, however, why changing macroeconomic conditions may influence religiosity. First, the opportunity cost of religiosity may change over the business cycle. Second, religiosity may be influenced by the return to religious social capital formation varying over the business cycle. Third, the need for consumption smoothing over the business cycle may also affect religiosity. From a theoretical perspective, then, there exists the possibility of a cyclical component in religiosity. It is surprising that these theoretical links and the musings of religious leaders have not motivated more empirical analysis, especially since religion continues to be important in many parts of the world and there is no end in sight for the business cycle.<sup>1</sup> This paper attempts to fill this void by providing a broad empirical look at the relationship between the business cycle and U.S. Protestant religiosity. It does so by specifically examining whether the time-intensive form of religiosity, religious participation, is influenced by changing macroeconomic conditions.

A key assumption in this paper is that increased religious participation by U.S. Protestants will be manifested in increased attendance at churches and, in turn, in increased church membership. While increased religious participation could also be manifested in other

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<sup>1</sup>Religion especially is an important part of the world's largest economy, the United States. A 2004 American National Election Survey showed 77 percent of respondents stated religion was an important part of their life. The 2006 General Social Survey showed just about 40 percent of the respondents claiming to attend church on an almost weekly basis, a pattern that has existed at least since the 1930s when polling first started (Iannaccone, 1998).

ways, it should be seen at a minimum in increased church attendance and eventually in increased membership if some of the new attendees formally join the church. A decrease in religious participation would work the other way. With this understanding in mind, the relationship between the business cycle and religious participation by U.S. Protestants is examined in this paper using a variety of measures. First, data from a Pew Research Center survey administered during the U.S. recession in 2001 is used in a probit model to assess the determinants of weekly attendance for both evangelical and mainline Protestants. Second, annual membership data spanning 1968 to 2004 for 14 evangelical Protestant denominations and 11 mainline Protestant denominations are examined in a number of time series regressions to see if they are systematically related to the NBER business cycles dates, the unemployment rate, real GDP, oil prices, real stock prices, and the yield curve spread. Finally, using quarterly data on new members for the period 1950:Q1 through 2006:Q4 for the Seventh-day Adventist (SDA) church—one of the 14 evangelical Protestant denominations—a series of vector autoregressions are run to determine the dynamic relationships between SDA converts and the above macroeconomic variables.

Presaging the conclusions, this paper finds a meaningful cyclical component to religious participation by U.S. Protestants. The cyclical component, however, varies based on the type of Protestant: evangelical Protestant denominations have unequivocally a strong countercyclical component while mainline Protestant denominations on balance have a procyclical component. To the extent, then, increased religious participation is an objective of these denominations, only leaders of evangelical denominations should be praying for a recession.

## II. Motivation and Previous Findings

Formal motivation for the link between changing macroeconomic conditions and religious participation can be found in several strands of the economics of religion literature. The first one comes from the standard economic model of religiosity originally developed by Azzi and Ehrenberg (1975). A key assumption in this model is that religious participation—the time-intensive form of religiosity—and religious giving—the non-time intensive form of religiosity—are substitutes in the production of afterlife consumption.<sup>2</sup> As a result, the model implies that the changing opportunity cost of religious participation over the business cycle will be offset by changes in religious giving. For example, during an economic expansion, individuals may find increased opportunities for higher earnings. If their labor supply decision is by dominated by the substitution effect, then the potential for higher earnings will make religious participation such as church attendance increasingly costly for these individuals. As a result, individuals will substitute out of religious participation and into religious giving and vice versa. This understanding implies there would be, *ceteris paribus*, a countercyclical component to religious participation. Conversely, if the income effect dominated and religious participation is a normal good, then the potential for higher earnings may actually lead to more religious participation and vice versa. A similar response would occur if the economic expansion increased individuals' non-labor income or generated for them a positive wealth effect from higher asset prices. Here, there would be, *ceteris paribus*, a procyclical component to religiosity.

In applying this opportunity cost approach to religious participation by U.S. Protestants, two key empirical findings suggest a distinction should be made between evangelical and mainline Protestants. First, studies have consistently found that evangelicals Protestants

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<sup>2</sup> Gruber (2004) provides empirical evidence to support this assumption.

typically fall into a lower socioeconomic group than mainline Protestants (Pyle, 2006). Second, real wages have been found to be particularly procyclical for low-income, less educated, and less established individuals (Swanson, 2008). Evangelical Protestants, therefore, are likely to face real wages that are more procyclical than their mainline counterparts. Given this possibility and their lower socioeconomic status, it is more likely that the labor-leisure choice faced by evangelical Protestants is dominated by the substitution effect. To the extent there is any procyclicality in the real wages of mainline Protestants, their higher socioeconomic status suggests their labor-leisure choice would not only face a stronger income effect but also a stronger wealth effect. This understanding, therefore, indicates religious participation by evangelical Protestants should have a countercyclical component while mainline Protestants should have a procyclical component.

A second motivation for the relationship between changing macroeconomic conditions and religious participation builds upon the notion that religious participation can lead to social capital formation (Schmidt, 2003). Individuals that participate in a religious organization may find future payoffs in the form of social support and networking opportunities. This investing in social capital, however, may generate different returns based on the characteristics of the religious organization and the stage of the business cycle. For example, individuals may find that attending a church filled with established business owners or wealthy patrons during an economic boom would be good for making business contacts, creating deals, and obtaining customers. In such circumstances, there would be an increased incentive for religious participation. On the other hand, during an economic downturn there would be fewer business opportunities at the church and, thus, less incentive for religious participation. Moreover, at a church with such accomplished parishioners status could be important. If so, there would be a

high social capital consumption cost for being adversely affected by the economic downturn, such as becoming unemployed. This again would reduce the incentive for religious participation during an economic downturn. During an economic boom, though, one could get added social capital formation from achieving high economic status. Here, there would be an added incentive for religious participation. Social capital formation at this church, then, creates the incentives for procyclical religious participation. Conversely, a church comprised of individuals with more modest accomplishments and means would not have as high a return to social capital formation during an economic boom, but also would not have the high social capital consumption cost during an economic downturn. As a result, economically distressed individuals would increase their participation at this church during economic downturns, but decrease it during economic booms. Social capital formation at this church, therefore, creates the incentives for countercyclical religious participation. As applied to the U.S. Protestants, the social capital formation view of religious participation suggests that mainline Protestant denominations, whose parishioners come from a higher socioeconomic background than their evangelical counterparts and are therefore more accomplished and established, would tend to see more of a procyclical component to religious participation in their churches. Evangelical Protestant denominations, on the other hand, would tend to see a more countercyclical component according to this view.

A third motivation for the relationship between changing macroeconomic conditions and religious participation is that religious participation may serve to smooth consumption over the business cycle. During an economic downturn individuals may become unemployed or find their earnings fall. In order to prevent these developments from disrupting their consumption flows, they may turn to their faith community for both real consumption needs such as food and

clothing as well as intangible consumption needs such as a sense of certainty and divine guidance in a job search. To the extent churches provide such consumption smoothing over the business cycle, there should be a countercyclical component to religious participation. As applied to U.S. Protestants, it is important to note that not all Protestant denominations can provide the same level of consumption smoothing. Mainline Protestant denominations typically place less emphasis on absolute truths than their evangelical counterparts. They, therefore, are not able to create the same sense of certainty or appeal to an all powerful God who is able to provide jobs. As a result, individuals who find their need for intangible consumption smoothing dominates their need for real consumption smoothing may opt to join an evangelical Protestant denomination rather a mainline one during an economic downturn. Conversely, these same individuals may find a mainline Protestant denomination more appealing than an evangelical one during an economic upturn when the need for certainty and employment are less pressing concerns. The consumption smoothing approach to religious participation, then, indicates mainline Protestant denominations would tend to see more of a procyclical component to religious participation in their churches while evangelical Protestants would tend to see more of a countercyclical component.

Interestingly, all three formal motivations suggest that if economic distress causes individuals to increase their religious participation they are more likely to do so in an evangelical Protestant church. Conversely, if an economic boom causes individuals to increase their religious participation they are more likely to do so in a mainline Protestant church. A priori, then, economic theory suggests that evangelical Protestant churches should benefit most from recessions while mainline Protestant churches should benefit most from economic booms. These predictions find support in the limited empirical work that has been done on this issue. Sales

(1972) looks at the effect of ‘economic threat’ on annual conversion rates in eight denominations over the years 1920-1939. Using annual per capita disposable personal income as a measure of economic conditions, Sales finds the conversion rates for ‘authoritarian’ or more conservative denominations to be countercyclical while for more liberal denominations they are procyclical. He explains these patterns by arguing that more conservative denominations are psychologically appealing during economic downturns for the sense of security they bring. Conversely, the ‘non-authoritarian’ or more liberal denominations resonate better during economic upturns for the flexibility they provide.<sup>3</sup> McCann (1999) similarly looks at membership growth rates in ‘authoritarian’ and ‘non-authoritarian’ denominations for the decades 1955-1964, 1965-1974, and 1975-1984. Like Sales (1972), he finds that membership in the conservative denominations respond more to threatening times, including economic ones, while membership in liberal denominations respond more to less threatening times. Although both Sales (1972) and McCann (1999) support the formal motivations laid out above, the former study is limited to an early 20<sup>th</sup> century period while the latter one uses decadal averages over only three decades. More recently, Chen (2008) finds the Indonesian economic crisis of 1997-1998 spurred increased study of the Koran and increased attendance at Islamic school. He also finds that those individuals who became more religious had less of a drop in their consumption. Chen concludes from these results that increased religious participation provided for them an ex-post form of social insurance that helped to smooth their consumption. Although Chen results do show that changing macroeconomic conditions can influence religious participation, his findings fail to span an entire business cycle. Surprisingly, Sales (1972), McCann (1999), and Chen (2008) are the only studies that have directly examined the link between the business cycle and religious

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<sup>3</sup> One example Sales (1972) provides of these differences is that authoritarian denominations “stress the unimaginable might (and potential punitiveness) of God, while others view the Divine more as a friend and helper” (p. 422).

participation. While there have been studies showing that religious participation can provide partial insurance for real consumption and happiness against income shocks (Dehejia et al., 2007) and can also serve as a buffer against stressful life events (Ellison, 1991; Smith et al., 2003) none of them show macroeconomic downturns lead directly to increased religious participation.

The lack of conclusive evidence on this question is surprising for several reasons. First, many religious leaders have surmised for some time that changing macroeconomic conditions influence religious participations (Vitello, 2008). Second, religion continues to be important in many parts of the world and business cycles continue to run their course. Third, there are formal motivations for why the business cycle should influence religious participation. In the sections that follow, this paper takes a broad empirical look at this issue by analyzing three separate sets of data. By looking at three different data sources, this paper is able to shed some light empirically in a more conclusive manner on the link between changing macroeconomic conditions and religious participation.

### **III. Weekly Attendance at Religious Services during the 2001 Recession**

The Pew Research Center conducted a survey in mid-November 2001 in the United States. The survey had a nationwide sample of 1500 adults and covered a number of issues, including the public's attitude toward religion. As can be seen in Figure 1, this survey followed a steep increase in the unemployment rate and occurred near the end of the NBER-dated 2001 recession. The timing of the survey, then, makes it ideal for studying the relationship between economic conditions and religiosity.

**[Insert Figure 1 around here]**

The measure of religiosity used here is based on the survey question that asks how regularly the respondents attend religious services. Specifically, a dummy variable equal to one is created for all those respondents who indicated they attend religious services at least once a week. All other respondents receive a zero. This attendance variable is then regressed in a number of probit regressions against a similarly-constructed unemployment dummy variable and other control variables. The probit model, then, is given by

$$P(\textit{Weekly Attendance} = 1) = \Phi(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \beta_{k+1} \textit{Unemployment}), \quad (1)$$

where  $\Phi(\cdot)$  denotes the standard normal cumulative distribution function and  $X_1, X_2, \dots, X_k$  represent the other control variables. This approach allows the probability of weekly attendance to be estimated conditioned upon the employment status of the respondent. As mentioned before, a key assumption here is that increase religious participation should be manifested in increased religious attendance. A confounding factor in this analysis is the 9-11 terrorist attacks which took place just a few months before the survey. This traumatic event, independent of the 2001 recession, probably caused an increase in religiosity and, if so, could create misleading inferences about the relationship between economic conditions and religiosity. Fortunately, this effect can be teased out in the regression by including a dummy variable for all respondents who answered the following survey question in the affirmative: “As a result of the terrorist attacks, are you attending religious services more or not?”

**[Insert Table 1 around here]**

Table 1 reports the results for these probit regressions.<sup>4</sup> P-values are reported in the brackets. In column (1), weekly attendance is regressed against unemployment status and controlling for the 9-11 effect. This regression is rerun in columns (2) and (3), but now includes

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<sup>4</sup> Due to missing observations for some variables, only 1258 observations could be used in the regressions.

a dummy variable to control for those respondents who indicated they were Protestant. Column (3) also includes age and the following other control variables in binary form (1,0): college education, female, married, white, and high income (income above \$75,000).<sup>5</sup> Iannaccone (1998) shows that these variables are important determinants of religious participation. As a robustness check, column (4) replaces age with a retired dummy variable for those aged 65 and older since this age group tends to be both more religious and unemployed than the average U.S. population (Iannaccone, 1998). In all cases unemployment is positively related to weekly attendance at religious services and is significant. Columns (5), (6), and (7) report regressions where Protestants are separated into an evangelical or other (i.e. mainline) Protestant category using the same control variables as before.<sup>6</sup> Here again, unemployment is positively related to weekly attendance and is statistically significant. Interestingly, evangelical Protestants are positively related to weekly attendance, while other Protestants are negatively related. Given these results, an interesting question is whether there would be any interaction effects among employment status and type of Protestant. Columns (8), (9), and (10) report regressions that test for such interactions. Here, unemployed evangelical Protestants are statistically significant and have a larger coefficient value than the employed evangelical Protestants. For other Protestants the effect of being unemployed on weekly attendance is very small and not significantly different than zero. For employed other Protestants, however, the effect is larger, significant, and negative. This result indicates an asymmetric response for other Protestants: being employed decreases one's probability of attending weekly while being unemployed fails to increase the probability.

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<sup>5</sup> Other income groupings were also tried, but none were found to be significant.

<sup>6</sup> Respondents were classified as evangelical Protestants if they answered yes to following question: "Would you describe yourself as 'born again' or evangelical Christian, or not?" Respondents were labeled as other Protestants if they answered no to this question but indicated elsewhere they were Protestant.

Table 2 translates these estimates into probabilities. The top row shows the overall probability of weekly attendance for the sample, while the remaining rows report the discrete change in probability of attending from changing the binary variables from 0 to 1. This table shows that the weekly attendance probability increases about 27 to 28 percentage points for unemployed evangelical Protestants while effectively seeing no change for unemployed other Protestants. Relative to their employed counterparts, unemployed evangelical Protestants have a weekly attendance probability that is about 7 to 8 percentage points higher. This difference is a nontrivial given the overall probability of attendance in the sample is approximately 42 percent. Unemployed other Protestants also have a higher probability of weekly attendance than their employed counterparts. In this case, however, the difference exist not because unemployed other Protestants are more likely to attend weekly religious services, but because employed other Protestants are less likely to attend weekly religious services. These results indicate, therefore, that being unemployed, only had meaningful consequences for evangelical Protestants during the 2001 recession in terms of weekly religious attendance. These results also indicate that relative to other Protestants there was a stronger countercyclical effect on religious participation for evangelical Protestants during this time.

These results, however, may not be capturing the full effect of recessions on religious participation. This is because unemployment alone does not fully reflect for all individuals the economic distress that can be created during an economic downturn. For example, some individuals may have become more religious during the 2001 recession not because they had lost their jobs, but because they were fearful they would lose their jobs. Others, such as individuals working in retail sales, may not have had their employment status threatened but may have experienced a financially destabilizing reduction in earnings. The impact of any recession, then,

may be broader than employment status alone would indicate. Still, these results by themselves suggest that there is some countercyclical component to religious participation, particularly for evangelical Protestants.

#### **IV. Membership Growth in Protestant Denominations**

That economic conditions may influence religious participation beyond what is indicated by unemployment status is explored in this section of the paper by examining the relationship between a number of macroeconomic variables and the growth of Protestant denominations. Again, the assumption here is that increased religious participation should lead to higher church attendance and, in turn, to an increase in the number of converts or new members. Changes in denominational membership, then, should reflect to some extent macroeconomic-driven changes in religious participation.<sup>7</sup> To make quantitative measurements of this potential relationship between economic activity and membership, a number of time series regressions were run that regressed current and lagged macroeconomic variables on measures of mainline and evangelical Protestant denominations.

Data for membership in Protestant denominations comes from *The State of Church Giving through 2004*. This annual volume collects membership data on a number of Protestant denominations, but only has a consistent annual series across 25 Protestant denominations that runs from 1968 through 2004. This volume classifies the 25 Protestant denominations into 11 mainline Protestant denominations and 14 evangelical Protestant denominations. This grouping of denominations is adopted here since it is consistent with the standard RELTRAD

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<sup>7</sup> Technically, membership changes can reflect both converts and dropped members, where the latter group consists of individuals removed from membership because of death or defection. Because of dropped members, changes in membership can reflect influences other than changes in religious participation. However, since data on attendance and converts is not available for most Protestant denominations, membership data, which is widely available, it is adopted here as a proxy.

classification system used in the religious studies literature (Steensland et al., 2000).<sup>8</sup> Table 3 shows the list of denominations making up the mainline and evangelical Protestant denominations and Figure 3 shows the trends in membership for these two groups over the sample.

**[Insert Table 3 and Figure 3 around here]**

As seen in Figure 3, membership in the evangelical Protestant denominations consistently increased at an annual average rate of 1.10 percent over the sample. Mainline Protestants, on the other hand, persistently declined over the same time at a rate of -0.94 percent. In terms of absolute membership, evangelical Protestant membership grew from 15.4 million to 23.2 million while mainline Protestant membership fell from 26.1 million to 18.6 million. As a result of these changes, total Protestant membership—the sum of the mainline and evangelical Protestant denomination memberships—in the sample was almost unchanged going from 41.5 million in 1968 to 41.8 million in 2004. These trends in the sample are consistent with those found in other studies that have looked at similar groupings of Protestants (Iannaccone, 1998).

The macroeconomic variables used in the analysis are a NBER recession indicator, the unemployment rate, real gross domestic product (GDP), oil prices, the real S&P500 index, and the yield curve spread. The NBER recession indicator is a dummy variable set equal to one for every NBER-defined recession year. The next two variables provide coincident indicators of economic conditions while the last three variables provide leading indicators of economic activity. For the unemployment rate, both the level and the change are used as a robustness check. Oil prices have spiked prior to most of the post-World War II U.S. recessions while

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<sup>8</sup> One of the denominations in the evangelical grouping, the Seventh-day Adventist church, was not listed in *The State of Church Giving through 2004* volume as an evangelical denomination, but is counted here as one since it listed as one in the RELTRAD classification system. The Seventh-day Adventist church considers itself to be an evangelical Protestant denomination.

movements in stock prices often precede similar movements in broader economic activity.<sup>9</sup> In this context, though, stock prices may also be more than a leading economic indicator, since they can reflect what is happening to an individual's wealth. The yield curve spread—the difference between long-term interest rates and short-term interest rates—in particular has been found to be a good predictor of economic activity. Whenever this measure has turned negative (positive) economic activity has slowed down (picked up) (Estrella, 2005). Here, the yield curve used is the 10-year treasury minus the 1-year treasury. All macroeconomic data except for the real stock prices has been taken from the FRED database at the St. Louis Federal Reserve bank. The real stock prices come from Robert Shiller's home page.<sup>10</sup>

Since the membership data is only available at an annual frequency, all the regressions are estimated using use annual data. The time span of the membership data also limit the sample period for the regressions to the years 1968 to 2004. Except for the unemployment rate and yield curve spread, all variables were turned into growth rates to avoid unit root problems in the analysis that follows. Newey-West standard errors were also estimated for all regressions so that the results are robust to serial correlation. Table 4 reports the descriptive statistics for the membership and macroeconomic variables used in the regressions.

**[Insert Table 4 around here]**

The first set of regressions run were simple univariate ones to determine if there are any systematic relationships between the macroeconomic variables, either in current or lagged form, and the different categories of Protestant membership. Formally, these regressions can be stated as follows:

$$m_t = \beta_0 + \beta_1 x_{t-j} + \varepsilon_t, \quad (2)$$

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<sup>9</sup> See Hamilton (2005) for a discussion on oil and the macroeconomy and Stock and Watson (2003) for a review of the economic forecasting ability of stock prices.

<sup>10</sup> <http://www.econ.yale.edu/~shiller/>.

where  $m$  is membership,  $x$  is a macroeconomic variable,  $t$  is the time period subscript, and  $j = 0, 1$ . The results from these regressions are reported in table 5. The results from the first regression for the mainline and evangelical Protestant groupings shows the NBER recession dummy variable is negatively related to the mainline Protestants, but positively related to evangelical Protestants. These signs imply a procyclical component for the former Protestants and a countercyclical component for the latter Protestants. Significance, however, is only found for the evangelical Protestants. The estimates show that during recessions evangelical Protestant membership grew 1.52 percent a year, a sizeable increase over the 0.98 percent a year growth in the non-recession years. The  $R^2$  also shows that almost 19 percent of the variability in Protestant membership growth can be explained by the NBER Recession dummy. The unemployment rate and its first difference are similarly found to be significant for the evangelical Protestants but not the mainline Protestants. The estimates imply a positive one-standard deviation shock to the contemporaneous unemployment rate or its first difference pushes up the evangelical Protestant membership growth rate by 0.17 percent, while a standard deviation shock to lagged value of the unemployment rate first difference results in an increase of 0.19 percent. These are modest increases given the sample average membership growth rate for this group is 1.1 percent. The real GDP coefficient estimates are found to be negatively related to membership growth for evangelical both contemporaneously and lagged, while negatively related to mainline Protestants contemporaneously and positively with a lag. In neither case, however, is there statistical significance.

**[Insert Table 5 around here]**

Real stock prices are found to be negatively related to membership growth for evangelical Protestants, with only the one-year lag being barely significant. A one-standard

deviation lagged real stock price shock increases the membership growth rate of evangelical Protestants by about 0.17 percent. This result is consistent with the findings so far and indicates that a booming stock market should reduce the religious participation of evangelical Protestants and vice versa. For mainline Protestants, however, the estimates show the relationship is reversed: a booming stock market should increase religious participation. Here, a one standard deviation real to the one-year lagged stock price pushes up the current mainline protestant membership growth rate by 0.21 percent, a non-trivial amount since the sample average membership growth rate for mainline Protestants is -0.94 percent. Moreover, the relationship is statistically significant and  $R^2$  on lagged real stock prices is 23.25 percent.

One way to make sense of these differing responses to the stock market is that, as noted earlier, mainline Protestants typically are in a higher socioeconomic status than evangelical Protestants. This fact has several implications. First, mainline Protestants are more likely than evangelical Protestants to have a larger percent of their wealth invested in the stock market. They are, therefore, more likely to have a strong wealth effect, the tendency for individuals to supply less labor and spend more if their perceived wealth increases. Given that religious participation is normal good, a booming stock market should lead, *ceteris paribus*, to more religious participation for mainline Protestants. This possibility finds support in Cheng and French (2000) who show that the labor supply response to a stock market-generated wealth effect can be large. Second, since evangelical Protestants have comparatively less of their wealth in stocks, the stock market for them is more of a leading economic indicator. Thus, a booming stock market for them foretells of the increased opportunity costs of religious participation.

Spot oil prices are found to be positively related to membership growth rates for both Protestant groupings, but are only significant with the evangelical Protestants. For evangelicals,

then, an increase in oil prices leads to an increase in membership growth. More precisely, a one standard deviation shock to oil prices modestly pushes up the membership growth rate by 0.19 percent. By far, though, the best explainer of variability in membership growth for the evangelicals Protestants is the lagged yield curve spread. For them, the lagged yield curve spread explains almost 23 percent of the variability. A one standard deviation shock to the spread decreases the evangelical Protestant membership growth rate by 0.33 percent. The yield curve spread is also significant for the mainline Protestants, though it explains far less variability and leads to only a 0.14 percent decline following a standard deviation shock. The signs of the yield curve spread coefficients are negative for both Protestant groupings. This means a large positive spread, which usually indicates a growing economy, is associated with lower religious participation. The yield curve spread, then, points to a statistically significant countercyclical component for both evangelicals and mainline Protestant denominations.

Table 5 also reports how the macroeconomic variables are related to total Protestants—the sum of the evangelical and mainline Protestants. In all cases, the signs on the estimated coefficients show a countercyclical relationship between the macroeconomic variables and the growth of total Protestant membership. However, in only three cases were the results significant: the unemployment rate, the current and lagged spot oil price, and lagged yield curve spread. Interestingly, the yield curve spread provides the most explanatory power with a  $R^2$  of 22.35 percent.

Collectively, the results from table 5 can be summarized as follows. Religious participation in the evangelical Protestant denominations appear to be particularly sensitive in a countercyclical manner to macroeconomic conditions as indicated by both the NBER recession dummy and the broad number of macroeconomic variables that were found to be significant.

The mainline Protestants, however, were not significantly related to any of the macroeconomic variables other than stock prices and the yield curve spread. The yield curve spread indicates they have a countercyclical component while the stock prices pointed to a procyclical component. The  $R^2$  for these two variables indicates only the procyclical component to be strong. The larger  $R^2$  for the procyclical component and the negative sign on the NBER recession dummy, though not significant, suggest that on balance the mainline Protestant denominations tend to have a procyclical component in their religious participation. These results are consistent with the formal motivations laid out section two.

A second set of regressions run were done to get a better sense of the overall amount of variability in religious participation for the Protestant denominations that can be attributed to macroeconomic conditions. This time, a number of multivariate regressions were run using these same macroeconomic variables. Formally, these regressions can be represented as follows:

$$m_t = \beta_0 + \beta_1 x_{1,t} + \beta_2 x_{1,t-1} + \beta_3 x_{2,t} + \beta_4 x_{2,t-1} + \dots + \beta_k x_{i,t} + \beta_{k+1} x_{i,t-1} + \varepsilon_t, \quad (3)$$

where  $x_{1,t}, x_{1,t-1}, \dots, x_{i,t}, x_{i,t-1}$  are the macroeconomic variables in current and lagged form. Table 6 reports the best fitting model in terms of explained variability to emerge from this exercise for each Protestant grouping. These results indicate a sizable amount of variability in the membership growth rate can be explained by macroeconomic variables: the  $R^2$  for evangelical Protestants is 37.74 percent, for mainline Protestants it is 45.58 percent, and for total Protestants it is 45.36 percent. These results imply that religious participation for mainline Protestants is slightly more cyclical than for evangelical Protestants. Most of the explained variance—about 30 percent—for the mainline Protestants comes from the current and lagged real stock price, indicating, again, that on balance they have a procyclical component. The evangelical Protestants, on the other hand, have an unequivocal countercyclical component.

**[Insert Table 6 around here]**

## **V. Seventh-day Adventist Converts**

The previous section showed that relative to mainline Protestants, religious participation by evangelical Protestants has a strong countercyclical component. One question that was not addressed in this analysis is exactly how the countercyclical component plays out over time. A challenge in tackling this question is that most denominations publish data at an annual frequency. Such low-frequency data does not lend itself to the type of dynamic analysis that could answer how the countercyclical component plays out over time. Fortunately, one of the evangelical Protestant denominations, the Seventh-day Adventist (SDA) church, does collect quarterly data on converts, those individuals who formally join the church. The Secretariat of the North American Division of the SDA church collects and disseminates the conversion data for the United States in quarterly statistical reports.<sup>11</sup> For the SDA church, converts include individuals who join the church through baptism or through profession of faith. Again, the assumption here is that increased religious participation will lead to higher church attendance and, in turn, to more converts. Data on converts for the period 1950:Q1 through 2006:Q4 were collected and seasonally adjusted to create the time series seen in Figure 3.<sup>12</sup>

**[Insert Figure 3 around here]**

A vector autoregression (VAR) was then used to estimate the dynamic relationship between the macroeconomic variables and SDA converts. In a VAR there are  $n$  variables, each treated as a dependent variable in an equation with an equal number of its own lags and the lags of all the other variables entering its equation as explanatory variables. Each variable, then, in the VAR is considered endogenous or determined within the system of equations. Unexplained

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<sup>11</sup> The data also includes Canadian converts, but they are only 4.5% of the total converts on average since 1950. The quarterly statistical reports can be found at <http://www.nadadventist.org/sec/>.

<sup>12</sup> Seasonal adjustments were made with the ARIMA X-11 method.

variation or shocks to variables, however, can arise from outside the system of equations and are captured by the residuals in each estimated equation. The VAR is useful in this context because it can show how a shock to a macroeconomic variable can affect SDA converts over time. Specifically, it can show whether SDA converts respond in a countercyclical, acyclical, or procyclical manner to a macroeconomic shock. In this VAR, additional restrictions are imposed on the model so that converts cannot influence the macroeconomic variables. Consequently, macroeconomic shocks are allowed influence converts, but not vice versa. Formally, this approach starts with an autoregressive structural model of the form

$$A_0 y_t = A_1 y_{t-1} + \dots + A_p y_{t-p} + u_t, \quad (4)$$

where  $y_t$  is a  $n \times 1$  vector of endogenous variables,  $A_0, \dots, A_p$  are  $n \times n$  structural parameters matrices and  $u_t$  is a  $n \times 1$  vector of uncorrelated structural shocks that are assume to be multivariate normal with mean zero and unit variance. In this paper, the vector of endogenous is defined as follows:  $y_t = (gdp_t, unem_t, stock_t, oil_t, spread_t, conv_t)'$  where  $gdp_t$  is real GDP,  $unem_t$  is the unemployment rate,  $stock_t$  is the real S&P 500 index,  $oil_t$  is the spot oil price,  $spread_t$  is the yield curve spread, and  $conv_t$  is converts. The structural autoregressive model can be transformed into a structural moving average form so that the relationship between the endogenous variables and the structural shocks can be defined. The structural moving average model can be shown to be

$$\begin{aligned} y_t &= (D_0 + D_1 L + D_2 L^2 + \dots) u_t \\ &= D(L) u_t, \end{aligned} \quad (5)$$

where  $D_0 = A_0^{-1}$ ,  $D_i = (A_0^{-1} A_i) A_0^{-1}$ ,  $L$  denotes the lag operator, and  $i = 1, \dots, p$ .<sup>13</sup> The coefficient

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<sup>13</sup>  $L^k y_t = y_{t-k}$

matrices in  $D(L)$  represent the dynamic multipliers of the structural shocks. As it stands, (5) is still a structural model and cannot be estimated directly. Rather, a reduced form version must be estimated and then identifying restrictions imposed to recover the structural model. The reduced form moving average can be expressed as follows:

$$y_t = (I + C_1L + C_2L^2 + \dots)\varepsilon_t$$

$$y_t = C(L)\varepsilon_t. \quad (6)$$

There is a mapping between the reduced-form parameters in (6) and the structural parameters in (5) since  $\varepsilon_t = D_0u_t$ ,  $C(L) = D(L)D_0^{-1}$  and  $E\varepsilon_t\varepsilon_t' = \Sigma = D_0D_0'$ . However, this mapping is not unique as an infinite number of values of  $D_0$  can satisfy  $\Sigma = D_0D_0'$ . Consequently, even though the reduced form parameters  $C(L)$  and  $\Sigma$  are directly estimable, identifying restrictions need to be imposed to recover the structural shocks. The identification scheme adopted here is to use the standard Choleski decomposition of  $\Sigma$  which restricts  $D_0$  to be lower triangular and thus orthogonalizes the shocks into an ordering that follows the variable ordering in the  $y_t$  vector.<sup>14</sup> In addition zero restrictions are placed on the structural matrices and on the Choleski decomposition so that the religiosity variables do not affect the macroeconomic variables.

The macroeconomic variables that were used in Section IV are used here in the VAR and come from the same sources. Now, however, the data are at a quarterly frequency. Also as before, all the macroeconomic variables, except for the yield curve spread and the unemployment rate are transformed into growth rates for the VAR. The unemployment rate, though, is first differenced. Standard unit root test indicate these transformations are sufficient

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<sup>14</sup> The empirical results that follow do not fundamentally change if the ordering of the variables change. The only notable difference is that the statistical significance of the conversion impulse response function becomes stronger for oil and unemployment. For more on VARs see Enders (2004).

for stationarity in the time series. Table 7 reports the summary statistics for these quarterly variables.

**[Insert Table 7 around here]**

After estimating the above model, cumulative impulse response functions (IRFs) can be created to show how a shock to a variable plays out dynamically on all the variables in the VAR. Here, each variable is given a positive one-unit shock. Since all variables are in percent form, this shock amounts to a 1 percentage point increase. Cumulative IRFs are accompanied by Monte Carlo-generated two standard error bands to provide a measure of precision for the estimates. The standard error bands are indicated by the dashed lines. Figure 3 shows the cumulative IRFs of the SDA conversion growth rate to each of the macroeconomic shocks as well as a shock to itself.

**[Inset Figure 4 around here]**

The first graph in Figure 4 reports the effect on converts from a positive 1 percent shock to the real GDP growth rate. This graph indicates there is a decline in the convert growth rate that becomes statistically significant 5 quarters out. At this the point the convert growth rate has fallen 1.46 percentage points, a meaningful amount given the average quarterly growth rate is 0.38 percent. The following graph shows an even more striking response: a one percentage point increase in the unemployment rate leads to statistically significant 6.61 percentage point increase in the convert growth rate by the fourth quarter. In both cases, though, the effect of the macroeconomic shocks is eliminated by the sixth quarter. The next two graphs report the IRFs for shocks to real stock price and spot oil prices. These graphs show there is no statistically significant response in the convert growth to these shocks. The next graph shows a very significant conversion response to the yield curve spread shock. Here, a one percentage point

increase in the yield curve spread—which as noted earlier typically forecasts an improvement in economic activity and, thus, should lead to a decline in religious participation—leads to a highly significant decline that begins in earnest about 6 quarters out and persists. The convert growth rate declines permanently about 6 percentage points. It is interesting that both here and in the previous section that the yield curve spread is found to be so strongly associated with movements in religious participation. Since in both cases the yield curve spread association is strongest with a lead of a year or more, these results reinforce the view that yield curve spread is a great predictor of future economic activity. Together, these responses weave an interesting story: a positive yield curve shock is a leading indicator of future economic activity by 1.5 years at which time real GDP would presumably increase and unemployment decline. In turn, these improved economic conditions would then drive down the number of converts until it reached a trough about a year later. Since this is a linear model the results also hold vice versa. These results show, then, that religious participation in the SDA church is driven, in part, by a countercyclical component. These results also provide two interesting policy implications for SDA church: first, the church should be monitoring the yield curve spread and second, it should see a noticeable change in converts about 1 year after a macroeconomic shock.

While the IRFs indicate that religious participation in the SDA church is sensitive to economic shocks in a countercyclical fashion, they do not reveal how important economic shocks are in explaining the overall variation of SDA religious participation. One way to measure the importance of economic shocks is to do a historical decomposition of the forecast variance for the convert growth rate over the sample. A historical decomposition consists of several steps. First, the estimated VAR is used to forecast the convert growth rate. Second, the difference between the forecast and the actual path of the convert growth rate can be attributed to

the accumulated effect of various shocks using the estimated VAR. Finally, the importance of a specific shock can be determined by comparing its accumulated effect on the convert growth rate to the sum of the accumulated effects from all of the shocks. This last step is formally stated as follows:

$$Relative\ Importance\ of\ Economic\ Shocks = \frac{|effect^{economic}|}{|effect^{economic}| + |effect^{non-economic}|},$$

where the double bars represent the absolute value,  $effect^{economic}$  is the accumulated effect of all economic shocks, and  $effect^{non-economic}$  is the accumulated effect of all non-economic shocks.

**[Insert Table 8 around here]**

Table 8 reports the relative importance of economic shocks on convert growth rate for the period 1960:1 – 2006:4. This table shows that economic shocks explain 34.37 percent of the forecast variability for the entire period. This amount varies by decade. For example, economic shocks explain as little as 21.73 percent of the forecast error in the 1960s and as much as 41.88 percent in the 1970s. The relative importance of macroeconomic shocks also varies by whether or not there is a NBER-defined recession: during recession years economic shocks explain 42.06 percent while in non-recession years they explain 32.85 percent. The key insight from the historical decomposition is that on average about a third of the forecast error in converts can be explained by economic shocks. This amount is in line with the results from Section IV that similarly showed just over a third of the variation in the membership growth of evangelical Protestants can be explained by macroeconomic variables. That so much of the VAR forecast error can be explained by economic shocks in a countercyclical manner means the business cycle is consequential to religious participation in the SDA church.

## **VI. Conclusions**

This paper has found evidence that there is a cyclical component to the religious participation for U.S. Protestants. Evangelical Protestants, in particular, were found to be responsive to downturns in the business cycle. The 2001 Pew Survey showed that being unemployed was an important determinant of weekly attendance during the 2001 recession for evangelical Protestants. More generally, during recessions for the years 1968-2004 evangelical denominations grew on average 1.52 percent annually, a significant pick up from the 0.98 percent growth rate in non-recession years. Evangelical Protestant membership growth was also found for these years to be systematically related to the unemployment rate, oil prices, real stock prices, and the yield curve spread. Just over a third of the variation in their membership growth rate could be attributed to changes in these macroeconomic indicators. The results for the analysis on the SDA converts, one of the evangelical Protestant denominations, indicate that the countercyclical component of converts lasts for about 1.5 years after a macroeconomic shock and that the yield curve spread does a good job predicting this change. To the extent, then, leaders of evangelical denominations want to increase their membership they should be closely following the yield curve spread and praying for a recession.

The growth of mainline Protestant denominations was also found to be responsive to economic conditions. Just under half of the variation in the growth of mainline Protestant denominations could be attributed to changes in macroeconomic indicators. The response of mainline Protestant denominations to the business cycle, however, was less countercyclical than the evangelical Protestants and even had a procyclical component to it. Stock market booms, in particular, were found to be associated with a non-trivial pickup in the membership growth rates of mainline Protestant denominations. Mainline Protestants on balance appear to have a

procyclical component in their membership growth rate. Mainline Protestants, then, should not be praying for a recession.

These findings confirm what economic theory indicates should be the case: economic distress that causes individuals to increase their religious participation should do so in an evangelical Protestant church while an economic boom that causes individuals to increase their religious participation should do so in a mainline Protestant church. That both Protestant groupings were found to empirically fit these predictions indicates macroeconomic conditions are an important determinant of religious participation for U.S. Protestants. An interesting extension of this study would be to see whether these results hold in other countries as well as in other faith communities. Finally, another interesting extension would be to see what happens to financial giving over the business cycle.

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**Table 1**  
**Weekly Attendance Regressions**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	-0.394 (0.000)	-0.542 (0.000)	-0.982 (0.000)	-0.729 (0.000)	-0.528 (0.000)	-1.001 (0.000)	-0.759 (0.000)	-0.398 (0.000)	-0.897 (0.000)	-0.656 (0.000)
Unemployed	0.306 (0.000)	0.263 (0.001)	0.167 (0.059)	0.183 (0.046)	0.244 (0.002)	0.171 (0.058)	0.173 (0.064)	--	--	--
Attend More Because of Sept. 11	0.653 (0.000)	0.655 (0.000)	0.660 (0.000)	0.649 (0.000)	0.591 (0.000)	0.611 (0.000)	0.600 (0.000)	0.592 (0.000)	0.609 (0.000)	0.599 (0.000)
Protestant	--	0.305 (0.000)	0.261 (0.001)	0.271 (0.001)	--	--	--	--	--	--
Evangelical	--	--	--	--	0.689 (0.000)	0.659 (0.000)	0.671 (0.000)	--	--	--
Other Protestant	--	--	--	--	-0.112 (0.229)	-0.174 (0.068)	-0.175 (0.068)	--	--	--
Employed Evangelical	--	--	--	--	--	--	--	0.509 (0.000)	0.491 (0.000)	0.499 (0.000)
Unemployed Evangelical	--	--	--	--	--	--	--	0.766 (0.000)	0.691 (0.000)	0.715 (0.000)
Employed Other Protestant	--	--	--	--	--	--	--	-0.322 (0.003)	-0.357 (0.001)	-0.353 (0.002)
Unemployed Other Protestant	--	--	--	--	--	--	--	0.145 (0.284)	0.026 (0.859)	0.021 (0.890)
College	--	--	0.118 (0.153)	0.121 (0.145)	--	0.194 (0.022)	0.196 (0.021)	--	0.167 (0.048)	0.170 (0.044)
Female	--	--	0.130 (0.082)	0.150 (0.044)	--	0.098 (0.198)	0.118 (0.121)	--	0.129 (0.087)	0.149 (0.047)
Married	--	--	0.360 (0.000)	0.405 (0.000)	--	0.345 (0.000)	0.390 (0.000)	--	0.364 (0.000)	0.409 (0.000)
White	--	--	-0.243 (0.014)	-0.225 (0.022)	--	-0.209 (0.036)	-0.194 (0.051)	--	-0.221 (0.002)	-0.206 (0.037)
High Income	--	--	0.081 (0.377)	0.095 (0.300)	--	0.116 (0.214)	0.132 (0.159)	--	0.114 (0.218)	0.130 (0.163)
Age	--	--	0.008 (0.001)	--	--	0.008 (0.002)	--	--	0.008 (0.002)	--
Retired	--	--	--	0.280 (0.019)	--	--	0.303 (0.013)	--	--	0.298 (0.012)
Number of Observations	1258	1258	1258	1258	1258	1258	1258	1258	1258	1258
LR pvalue	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Psuedo R2	0.033	0.043	0.070	0.071	0.079	0.110	0.108	0.068	0.101	0.099

**Pvalue in brackets.**

**Table 2**  
**Discrete Change in Predicted Probability of Weekly Attendance**  
**(Dummy Variable  $\Delta$  from 0 to 1; Other Variables at Mean)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Overall Probability of Attendance</b>	<b>42.01%</b>	<b>41.90%</b>	<b>41.55%</b>	<b>41.60%</b>	<b>41.79%</b>	<b>41.43%</b>	<b>41.46%</b>	<b>41.83%</b>	<b>41.44%</b>	<b>41.47%</b>
Unemployed	12.04%	10.34%	6.56%	7.16%	9.58%	6.70%	6.77%			
Employed Evangelical								20.10%	19.37%	19.71%
Unemployed Evangelical								29.70%	27.00%	27.88%
Employed Other Protestant								-12.16%	-13.40%	-13.26%
Unemployed Other Protestant								0.057%	0.01%	0.01%

**Table 3**

**Mainline Protestant Denominations**

American Baptist Churches in the USA  
 Christian Church (Disciples of Christ)  
 Church of the Brethren  
 The Episcopal Church  
 Evangelical Lutheran Church in America  
 Friend United Meeting  
 Moravian Church in American, Northern Prov.  
 Presbyterian Church (USA)  
 Reformed Church in America  
 United Church of Christ  
 The United Methodist Church

**Evangelical Protestant Denominations**

Assemblies of God  
 Baptist General Conference  
 Brethren in Christ Church  
 Christian and Missionary Alliance  
 Church of God (Cleveland, TN)  
 Church of the Nazarene  
 Conservative Congregational Christian Conference  
 Evangelical Congregational Church  
 Free Methodist Church of North America  
 General Association of General Baptists  
 Lutheran Church-Missouri Synod  
 Salvation Army  
 Seventh-day Adventist Church  
 Southern Baptist Convention

**Table 4**

<b>Variables (Annual Frequency)</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Mainline Protestants	-0.0094	0.0047	-0.0202	0.0006
Evangelical Protestants	0.0114	0.0059	-0.0024	0.0224
Total Protestants	0.0005	0.0034	-0.0079	0.0078
Unemployment Rate	6.1611	1.4285	3.5000	9.7000
$\Delta$ Unemployment Rate	0.0528	0.9614	-2.1000	2.9000
Real GDP Growth Rate	0.0298	0.0197	-0.0195	0.0694
Real S&P500 Growth Rate	0.0343	0.1649	-0.3247	0.2856
Spot Oil Price Growth Rate	0.1037	0.3154	-0.4709	1.3674
Yield Curve Spread (10y-1y)	1.4248	1.2509	-1.0301	3.4983

**Table 5**  
**Univariate Regressions**

Variables	Mainline Protestants		Evangelical Protestants		Total Protestants	
	Coeff.	(Pvalue)	Coeff.	(Pvalue)	Coeff.	(Pvalue)
<b>NBER Recession Dummy</b>	-0.0007	(0.684)	0.0054	(0.001)	0.0013	(0.265)
Intercept	-0.0092	(0.000)	0.0098	(0.000)	0.0001	(0.917)
R <sup>2</sup>	0.44%		18.76%		3.44%	
<b>Unemployment Rate<sub>t</sub></b>	0.0003	(0.674)	0.0012	(0.060)	0.0007	(0.066)
Intercept	-0.0114	(0.053)	0.0039	(0.418)	-0.0040	(0.150)
R <sup>2</sup>	1.02%		8.88%		9.68%	
<b>Unemployment Rate<sub>t-1</sub></b>	0.0000	(0.933)	0.0010	(0.387)	0.0002	(0.622)
Intercept	-0.0090	(0.046)	0.0080	(0.131)	0.0084	(0.000)
R <sup>2</sup>	0.03%		1.88%		0.46%	
<b>Δ Unemployment Rate<sub>t</sub></b>	0.0000	(0.954)	0.0018	(0.010)	0.0006	(0.238)
Intercept	-0.0094	(0.000)	0.0114	(0.000)	0.0004	(0.720)
R <sup>2</sup>	0.00%		8.33%		3.26%	
<b>Δ Unemployment Rate<sub>t-1</sub></b>	-0.0008	(0.209)	0.002	(0.032)	0.0001	(0.768)
Intercept	-0.0090	(0.000)	0.0112	(0.000)	0.0006	(0.253)
R <sup>2</sup>	3.49%		8.34%		0.16%	
<b>Real GDP Growth Rate<sub>t</sub></b>	-0.0153	(0.612)	-0.0505	(0.190)	-0.0303	(0.260)
Intercept	-0.0089	(0.000)	0.0128	(0.000)	0.0014	(0.163)
R <sup>2</sup>	0.42%		2.92%		3.16%	
<b>Real GDP Growth Rate<sub>t-1</sub></b>	0.0270	(0.336)	-0.0505	(0.190)	-0.0093	(0.619)
Intercept	-0.0099	(0.000)	0.0128	(0.000)	0.0009	(0.329)
R <sup>2</sup>	1.55%		2.92%		0.33%	
<b>Real S&amp;P500 Growth Rate<sub>t</sub></b>	0.0072	(0.075)	-0.0059	(0.310)	0.0027	(0.325)
Intercept	-0.0096	(0.000)	0.0116	(0.000)	0.0004	(0.545)
R <sup>2</sup>	6.51%		2.72%		1.72%	
<b>Real S&amp;P500 Growth Rate<sub>t-1</sub></b>	0.0127	(0.007)	-0.0100	(0.107)	0.0036	(0.333)
Intercept	-0.0094	(0.000)	0.0116	(0.000)	0.0005	(0.368)
R <sup>2</sup>	23.25%		7.85%		3.31%	
<b>Spot Oil Price Growth Rate<sub>t</sub></b>	0.0011	(0.374)	0.0059	(0.002)	0.0029	(0.004)
Intercept	-0.0095	(0.000)	0.0108	(0.000)	0.0002	(0.767)
R <sup>2</sup>	0.53%		10.01%		7.39%	
<b>Spot Oil Price Growth Rate<sub>t-1</sub></b>	0.0006	(0.609)	0.0046	(0.017)	0.0018	(0.045)
Intercept	-0.0091	(0.000)	0.0109	(0.000)	0.0005	0.432
R <sup>2</sup>	0.20%		6.14%		3.28%	
<b>Yield Curve Spread: 10yr-1yr<sub>t</sub></b>	-0.0001	0.86	-0.0018	(0.023)	-0.0004	(0.438)
Intercept	-0.0092	(0.000)	0.0132	(0.000)	0.0009	(0.302)
R <sup>2</sup>	0.08%		10.84%		1.65%	
<b>Yield Curve Spread: 10yr-yr<sub>t-1</sub></b>	-0.0011	(0.053)	-0.0026	(0.000)	-0.0014	(0.001)
Intercept	-0.0080	(0.000)	0.0138	(0.000)	0.0020	(0.001)
R <sup>2</sup>	0.08%		22.66%		22.35%	

**Table 6****Explaining Membership Variability**

<b>Variables</b>	<b>Mainline Protestants</b>	<b>Evangelical Protestants</b>	<b>Total Protestants</b>
Intercept	-0.009 (0.000)	0.007 (0.119)	-0.004 (0.038)
Unemployment Rate <sub>t</sub>			0.001 (0.001)
Unemployment Rate <sub>t-1</sub>		0.001 (0.069)	
Real S&P500 Growth Rate <sub>t</sub>	0.008 (0.023)		0.007 (0.027)
Real S&P500 Growth Rate <sub>t-1</sub>	0.015 (0.000)	-0.008 (0.020)	0.006 (0.010)
Spot Oil Price Growth Rate <sub>t</sub>			0.002 (0.059)
Spot Oil Price Growth Rate <sub>t-1</sub>	0.003 (0.029)		
Yield Curve Spread: 10yr-1yr <sub>t-1</sub>	-0.001 (0.001)	-0.003 (0.000)	-0.001 (0.000)
Number of Observations	35	35	35
R <sup>2</sup>	45.58%	37.74%	45.36%
Adj. R <sup>2</sup>	38.32%	31.71%	35.94%
F pvalue	0.0000	0.0048	0.0000

Pvalue in brackets.

**Table 7**

<b>Variables (Quartely Frequency)</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Convert Growth Rate	0.3820	8.7496	-23.6792	31.5014
Δ Unemployment Rate	0.0084	0.3991	-1.1000	1.6000
Real GDP Growth Rate	0.7890	0.9204	-2.7552	3.8657
Real Stock Price Growth Rate	0.9075	6.0484	-23.1970	18.1040
Spot Oil Price Growth Rate	1.4660	11.0998	-54.0618	85.2587
Yield Curve Spread (10y-1y)	0.8024	1.0250	-1.9400	3.2000

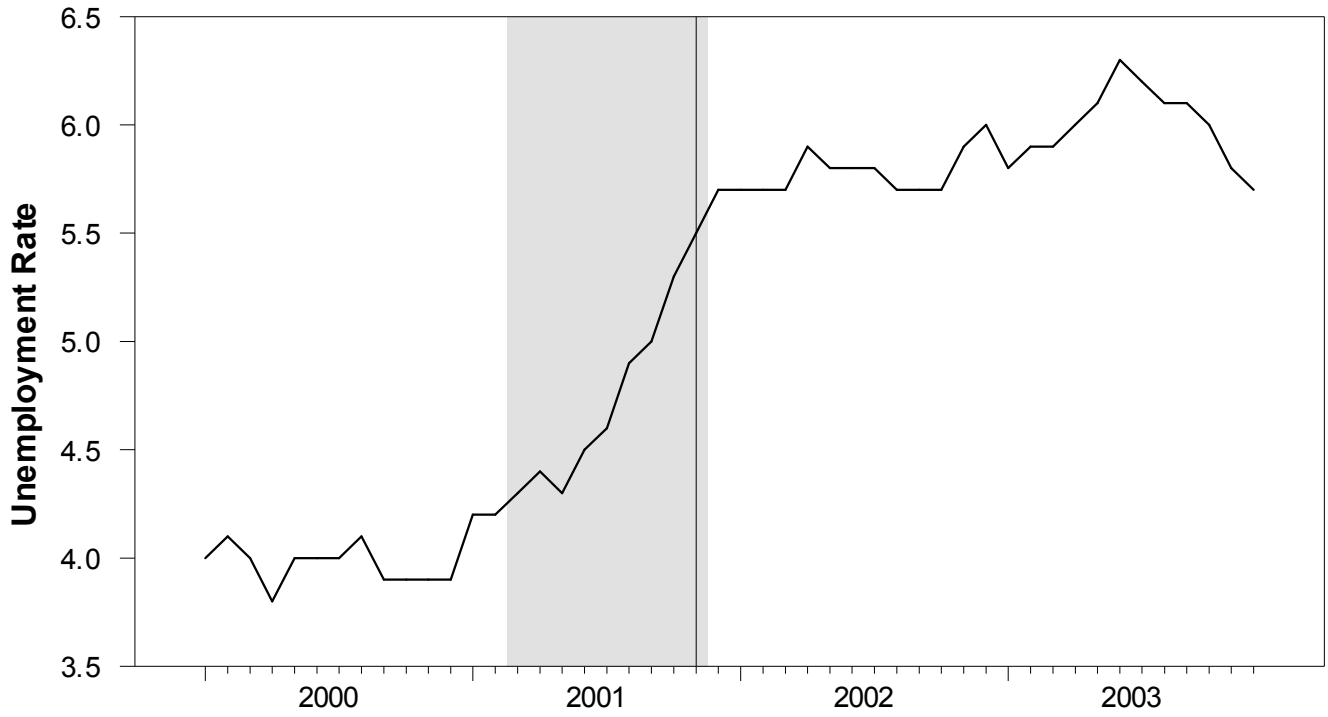
**Table 8**

**The Importance of Economic Shocks for SDA Converts**

<b>Periods</b>	<b>% of All Shocks Creating Forecast Errors</b>
1960s	21.73%
1970s	41.88%
1980s	35.53%
1990s	33.35%
2000s	41.50%
All Decades	34.37%
Recession	42.06%
Non Recession	32.85%

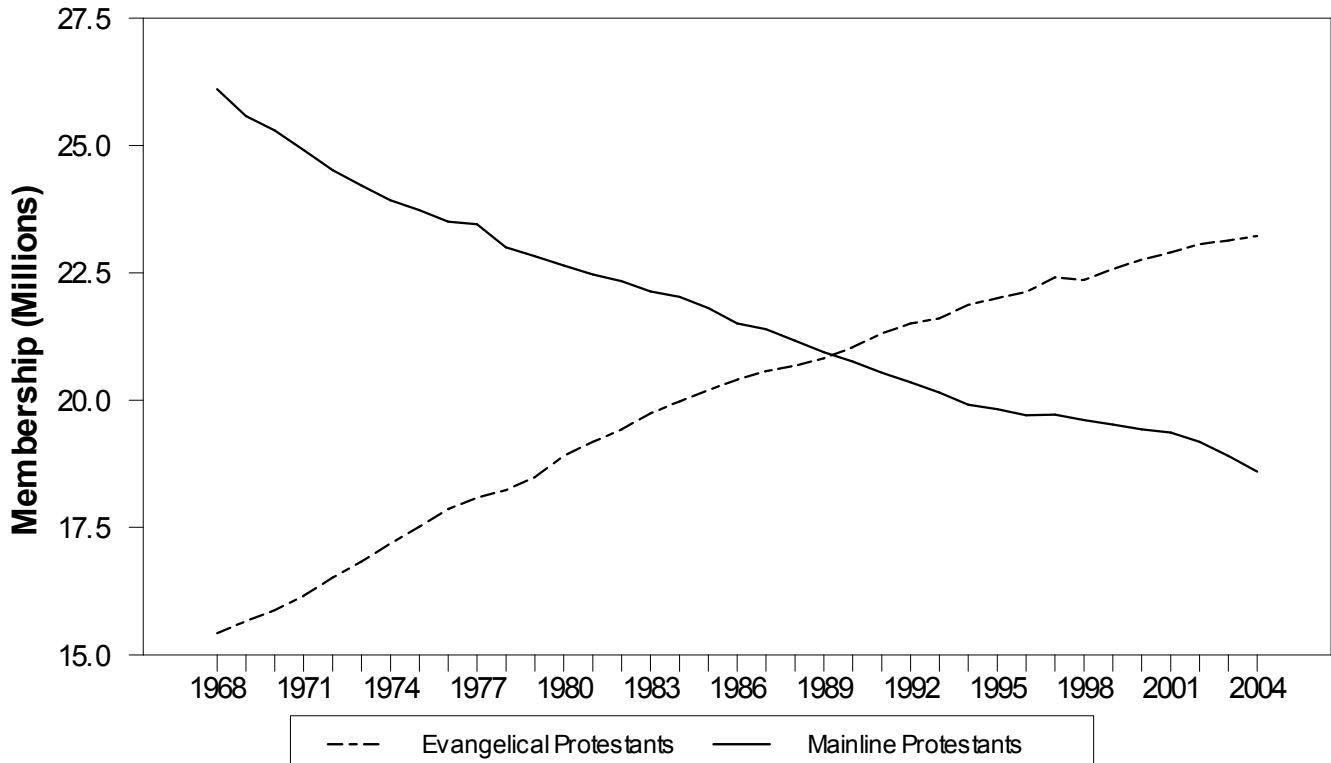
**Figure 1**

**The Unemployment Rate, the 2001 Recession, and the 2001 Pew Survey**  
(Shaded Area = NBER Recession, Vertical Line = Pew Survey)

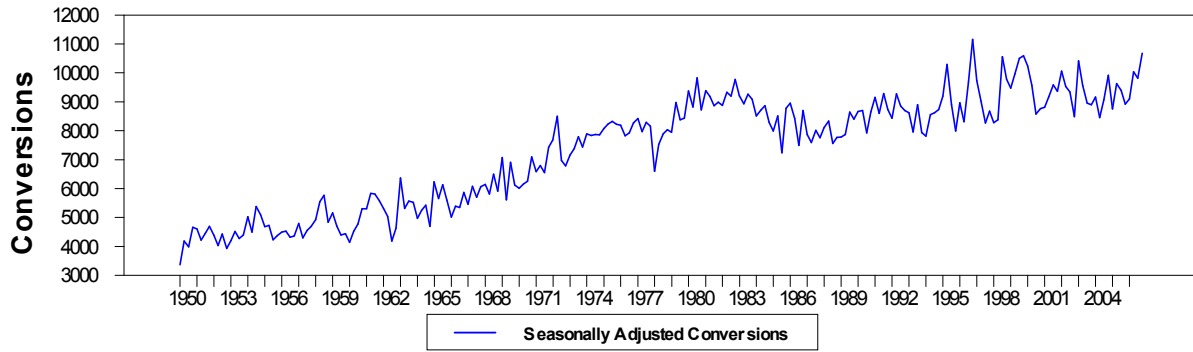


**Figure 2**

**Trends in the Evangelical and Mainline Protestant Denominations**



**Figure 3**



**Figure 4**

**Conversion Rate Cumulative Response to One Unit Shocks  
(Dotted Line = Two Standard Error Bands)**

