Wage Differentials in the United States:

Does Religion Matter?

BY

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THESIS

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SVB

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LIST OF ABBREVIATIONS

CP   CONSERVATIVE PROTESTANT

HCEF   HUMAN CAPITAL EARNINGS FUNCTION

IV   INSTRUMENTAL VARIABLE

MP   MAINLINE PROTESTANT

OLS   ORDINARY LEAST SQUARES

PSID   PANEL STUDY OF INCOME DYNAMICS

QR   QUANTILE REGRESSION

S   SUBJECT

SES   SOCIOECONOMIC STATUS

U.S.   UNITED STATES

WM   WHITE MEN

WW   WHITE WOMEN

SUMMARY

This dissertation examines the association between religion and wages for non-Hispanic white men and women in the United States (U.S.).[1] Two aspects of religion were examined: religious affiliation and religious participation, with the latter measured by the frequency of attendance at religious services. First, mean wage rate differentials between religious groups were estimated using the Ordinary Least Squares (OLS). Second, wage rate differentials along the wage rate distribution for each religious group were estimated using the Quantile regression (QR) methodology—a technique that has not been employed in the literature to date, and that uncovers interesting new patterns. Third, the returns to education were examined for three major religious groups: mainline Protestants (MPs), conservative Protestants (CPs) and Catholics. Finally, within religion effects of religious participation on wage rates were examined for MPs, CPs and Catholics. All analyses examined relationships for both non-Hispanic white women (WW) and non-Hispanic white men (WM). Gender differences for each religious group are discussed.

The findings reported in this dissertation are based on analyses of the Panel Study of Income Dynamics (PSID), a longitudinal data set of a representative sample of individuals residing in the U.S. All information used in the analyses is based on the 2005 survey year with the exception of the religious affiliation and participation variables, which are based on the 2003 survey year. The PSID survey collected detailed information about religious affiliation and participation starting with the 2003 wave, which made this research project possible.

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[1] Hispanics were not included in the analyses because of small sample size. All analyses refer to non-Hispanic whites. For an easier read, the "non-Hispanic white" and "white" terms will be used interchangeably throughout the text.

The association between religious affiliation and wage rates was estimated for WW using OLS and QR econometric methodologies. The estimates based on OLS revealed differences in wage rates between religious groups, consistent with previous findings: MPs and Catholics are at the center of the wage rate distribution, CPs, Mormons and the no religion group earn lower hourly wages, and Jews earn higher wage rates. Differences in the association between religious affiliation and wage rates across the wage rate distribution were also estimated using the QR regression method. The sample size allowed these differences to be estimated for MPs, CPs, Catholics and Jews.[2] The QR revealed that the association between religious affiliation and wages along the wage rate distribution displayed varied patterns between religious groups. Generally, the QR estimates showed patterns consistent with the OLS estimates; namely, CP women have lower wages and Jewish women have higher wages across the wage rate distribution. A new finding, revealed by the QR estimates, is that Catholic women have a statistically significant higher wage at the top of the wage distribution; statistical significance was lacking at the mean as shown by the OLS regression estimates.

The association between religious affiliation and wage rates for WM was estimated in a similar fashion using OLS and QR econometric methodologies. These analyses, along with comparisons by gender, represent new contributions to the literature, as earlier research had focused on women only. The OLS estimates showed that the association between religious affiliation and wage rates for WM had similar patterns to those of their female counterparts, with the noteworthy exception of Mormons. Specifically, MP and Catholic white men are at the center of the wage rate distribution, CPs and those not associated with any religious group earn

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[2] The sample for Jews was relatively small; however, because the estimates were highly significant and consistent with previous findings, the Quantile regression estimates were reported.

less, and Jews earn more. Mormon men, however, have higher wages, in contrast to the lower

wages of their female counterparts. Furthermore, the Quantile regression estimates revealed that

the wage disadvantage of CP men is larger at higher wage rates while the wage disadvantage of

CP women is generally uniform along the wage rate distribution.

Unquestionably, there is a strong association between religious affiliation and wage rates

for non-Hispanic whites, both men and women. Wage differentials by religious affiliation

follow similar patterns for both genders for Jews, CPs and the no religion group. However,

gender differences are apparent for Mormons and Catholics. MPs were used as benchmark. The

results in this thesis show the following results, with regard to comparisons by gender:

- *Jews* have higher wages than MPs at the mean as well as along the wage rate distribution. Similar patterns are visible for both Jewish men and women.

- *Conservative* Protestant men and women have lower wages than MPs at the mean as well as along the wage rate distribution. Furthermore, as can be seen from the QR estimates, CP men have a bigger disadvantage at the higher end of the wage rate distribution, compared to their MP counterparts.

- *Catholic* women earn wages that are not statistically different from the wages of their MP counterparts at the mean. However, the QR estimates reveal that Catholic women have a statistically significant higher wages than MPs at the high end of the wage distribution, namely the 7th and 8th deciles. Catholic men, on the other hand, have higher wages at the mean; which is not true across the wage rate distribution. Catholic men have higher wages at the low end of the wage distribution, but this advantage declines as wages increase and it completely disappears at high wages.

- *Mormon* women have lower wages than MP women while Mormon men have higher wages than MP men, based on the OLS regression estimates. [3]

- The *no religion* group has a lower wage than MPs for both WW and WM, based on OLS regression estimates. [4]

The OLS estimates showed larger *returns to education* for WW than WM, consistent with previous findings. Among women, differences in returns to education between CPs, MPs and Catholics cannot be discerned. Among men, CP men have lower rates of return to education than their MP and Catholic counterparts. Along the wage rate distribution, there is a sizeable difference in rates of return to education between men and women at low wages, which almost disappears for MPs and decreases for CPs at high wages. Catholic men and women appear to have similar rates of return to schooling across the wage rate distribution.

Previous research has only examined the possibility of non-linearities in the effects of *religious participation* on wages for the case of Jewish men (Chiswick and Huang, 2008). In this study, these effects were examined for MPs, CPs and Catholics for both men and women. OLS regression estimates revealed non-linear effects of religious participation on wage rates for MP men and women, and for Catholic men, similar to non-linear patterns found for Jewish men in earlier research (Chiswick and Huang, 2008). Religious participation does not have a statistically significant effect on wages for CP men or women, neither at the mean nor along the wage rate distribution. The effect of religious attendance on wages is different for Catholic men and women. The adverse effect of very high attendance at religious services is apparent for

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[3] Note that the Mormon sample is small; however, in spite of the small sample size, reasonable statistical significance of the estimates is observed. Because of the small sample size limitation; this group was excluded from the QR runs.

[4] Note that the no religion group is a heterogeneous group comprised of atheists, agnostics and unaffiliated and the results should be interpreted with caution.

Catholic men, similar to their MP counterparts; namely, attendance at religious services more often than weekly has a negative effect on wages compared to weekly attendance at religious services. A different pattern of the effect of religious participation on wages emerges for Catholic women; namely, lapsed Catholic women (i.e. those with zero attendance at religious services), have higher wages than their counterparts with weekly attendance at religious services, and the QR analysis shows that this difference is especially pronounced at high wages.

This dissertation contributes to the limited literature that examines the effect of religion on wage rates in a number of ways. First, while most previous studies have focused on examining the relationship between religion and wages for white women age 27–44, this thesis explored this relationship for both white men and women age 27–64. Second, the association between religion and wage rates was examined not only at the mean using OLS regressions but also along the wage rate distribution using the Quantile regression methodology. Third, a more recent data set was used for this dissertation than was used in previous studies. Fourth, estimates along the wage rate distribution were estimated for the first time for all relationships examined— the differentials in wages and returns to education among religious groups as well as the within religion effects of participation in religious services on wages. Lastly, the effects of religious participation on wages were examined for MPs, CPs and Catholics at the mean as well as along the wage rate distribution for both white men and white women, while previous studies have examined these effects only at the mean. In addition, this study used a specification which allowed for the possibility that the effects of very high levels of participation in religious services on wage rates may be adverse.

1. INTRODUCTION AND THE ECONOMICS OF RELIGION

1.1.   <u>Introduction</u>

Religion has played a major role in shaping the views and values of the American people since the beginning of the Colonial period, and has continued to play an important role in American public life (Pew Research Center, 2008). In fact, 83% of Americans belong to some type of religious group (Pew Research Center, 2007). Ample research has shown that religious affiliation and participation have significant effects on socioeconomic outcomes such as educational attainment (Chiswick, 1988; Lehrer, 2011); family decisions including entry into cohabitation and formal marriage, divorce, fertility and female labor supply (Lehrer, 2009); and wealth accumulation (Keister, 2005, 2011, 2012).

Limited research has been conducted on the influence of religion on wages specifically, but the existing research indicates that there is indeed a connection between the two. Lehrer (2010) has examined differences in the effects of religious affiliation on wage rates for non-Hispanic white women, 27 to 44 years old; a more restricted age group than is examined in this dissertation. Using data from the 1995 National Survey of Family Growth (NSFG), Lehrer (2010) found that wage differentials between religious groups are similar to the educational attainment differentials between these groups. The author found that mainline Protestants (MPs) and Catholics are at the center of the wage rate distribution, conservative Protestants (CPs) and the no religion group earn less, and Jews earn more. Lehrer (2010) concluded that substantial wage rate differentials between religious groups exist even after controlling for education and labor market experience, which are major determinants of wage rates.

Researchers have also recognized that gender and race play an important role in labor markets, and that wage rates differ across groups based on these factors. Large earning

differentials by race (Altonji and Blank 1999) and gender (Garcia, et al., 2001; Sakellariou, 2004) have been documented. Furthermore, it has been shown that the effects of religious affiliation on other socioeconomic outcomes, such as educational attainment, vary by race and gender (Lehrer, 2006). Additional studies have indicated systematic differences across religious groups in other economic and demographic variables (Ellison and Sherkat, 1995; Fitzgerald & Glass, 2008; Ellison & Hummer, 2010). Because of the complex interactions between religion, gender, and race, it is important to conduct separate analyses by gender and race.

Two main dimensions of religion are studied in this thesis: (1) religious affiliation: an individual's membership in a given religious group and (2) religious participation: how frequently an individual attends religious services. Lehrer (2010) suggested that "religious affiliation as an adult should be more relevant than affiliation during childhood" when studying the connection between religion and wages through mechanisms other than investment in schooling (Lehrer, 2010, p. 190). Religious *participation*, however, may be affected by two-way causality problems when measured at the time of the survey, as noted by Lehrer (2010). For example, high-wage individuals place a high value on time and therefore may choose to attend religious services less frequently. The issue of endogeneity remains a limitation; however, to help address it, this dissertation's analyses are based on Panel Study of Income Dynamics (PSID) data for religious affiliation and participation that were measured in 2003—two years prior the survey year of 2005. Use of childhood affiliation diminishes, but does not entirely eliminate, endogeneity problems[5] because childhood religion is correlated with many unobserved variables.

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[5] Endogeneity problems are commonly addressed by using Instrumental Variable (IV) methods or estimating simultaneous equation models; however, data limitations make these approaches unfeasible.

Earlier research has noted that there is a high correlation between childhood and adult religious affiliation (Keister, 2005, p.163)[6].

Motivated by the findings of Lehrer (2010) and the unique suitability of the PSID data, survey year 2005, this dissertation has focused specifically on the effects of religious affiliation and participation on wage rates that are beyond those of education and labor market experiences. Parallel analyses by gender are performed throughout this study. Because of limitations of sample size, the sample is restricted to a single race: non-Hispanic whites.

The dissertation is organized in the following manner. In the rest of this Chapter, the relatively new economics of religion field is described, and the rationale that has led researchers to expect that religious affiliation should have a significant effect on economic outcomes is discussed. Chapter 2 reviews the theory and literature of the determinants of wage rates including the role of religious affiliation and participation. Chapter 3 reviews the literature of the effects of religious affiliation and participation on other socioeconomic outcomes. Chapter 4 presents the theoretical framework, the empirical methodology, and model specification used in this study. Chapter 5 describes the data, variable construction, and sample selection processes. Chapter 6 presents the empirical findings based on Ordinary Least Squares (OLS). Chapter 7 examines the influence of religious affiliation along the wage rate distribution employing the Quantile regression (QR) methodology. Chapter 8 examines the returns to education by religious affiliation and gender for MPs, CPs and Catholics. Chapter 9 examines the within religion

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[6] As reported by Keister (2005, p.163), the correlation between childhood religious affiliation and the same adult religious affiliation is 0.87 for Jews and 0.77 for Catholics. Although the correlations for MPs and CPs are not reported, the correlations for the larger denominations within these religious groups are reported; i.e., 0.76 for Baptists, 0.65 for Episcopalians and 0.71 for Lutherans.

effects of religious participation on wage rates. Chapter 10 concludes with a discussion, contributions to the broader field of labor economics and directions for future research.

1.2. <u>The Economics of Religion</u>

What is religion? And why is it expected that religion would influence demographic and socioeconomic outcomes? The Foreword to Lehrer (2009), written by Barry Chiswick, describes religion as having "…many dimensions, including spirituality, community or social aspects, and, for some denominations, the 'after-life' for themselves or their loved ones. Regardless of dimension, religion is clearly an economic good" (Lehrer, 2009, p. xix). Religious involvement is costly in terms of both money and time. Barry Chiswick notes that people are willing to incur these expenditures because they perceive that there will be benefits greater than the costs.

These relative costs and benefits are judged in the context of religious education, which is an important part of a child's upbringing. Children accumulate religious human capital— "…skills, knowledge, memories, sensations…" specific to a particular religion—and this accumulation continues into adulthood (Chiswick, 2010, p. 11). The religious human capital has an effect on the "perceived costs and benefits of various interrelated decisions that people make over the life cycle" as noted by Lehrer (2004a, p.707), including education, marriage, divorce, fertility and female employment. In addition, religious affiliation is important for married couples because it is a "complementary trait within marriage"; i.e., religion can affect many activities that husband and wife do together, such as raising children (Lehrer, 2004a, p.708). To the extent that different religions promote different gender roles in the marriage relationship, differing socioeconomic outcomes are expected by gender.

Furthermore, congregants within each religion differ in terms of their religiosity, which "encompasses such dimensions as commitment to the religion, the strength of religious beliefs,

and participation in religious activities" (Lehrer, 2004b, p.205). Religiosity affects economic outcomes in part because the effects of religion are more pronounced for those who are highly religious. For example, the CP faith tends to discourage investments in secular schooling, and this influence should be more evident among those with a stronger commitment to the CP faith (Lehrer, 2011). In addition, some participation in religious activities has been found to be associated with beneficial consequences for many outcomes related to physical and mental health, such as lower probability of substance abuse and juvenile delinquency, lower smoking rates, delayed sexual debut, delayed entry into cohabitation (Donahue and Benson 1995; Strawbridge, Cohen, Shema, and Kaplan, 1997; Bearman and Bruckner, 2001; Lehrer 2004a; Gruber & Hungerman, 2008) and higher level of happiness (Cohen-Zada and Sander, 2008).

Chiswick notes that "the Economics of Religion seeks to ask and answer two fundamental questions: (1) how do economic incentives and institutions influence the style and practice of religion (denomination) and religiosity (the intensity of religious practice)? (2) How do religion and religiosity influence economic and demographic behaviors?" (Lehrer, 2009, p. xix). The analyses in this dissertation are intended to expand our understanding pertaining to the second question; specifically, the focus is on examining the role religion plays in influencing wage rates.

2. DETERMINANTS OF WAGE RATES AND THE ROLE OF RELIGION

The literature that examines the determinants of wage rates is briefly reviewed in this Chapter. As is well known, an individual's education and labor market experience have a strong influence on wage rates. These factors are discussed first, followed by the influence of school quality. Next, the influence of family background and individual characteristics on wage rates is discussed. Finally, the roles religious affiliation and participation play in determining wage rates are discussed. Research on the religion–wages relationship is very limited and this study aims at filling this gap in the literature.

2.1. Education and Labor Market Experience

Economic theory suggests that human capital and skills acquired through education and on-the-job training are important determinants of wage rates (Mincer, 1974). Indeed, U.S. data show that average earnings of full time workers rise with the level of education (Ehrenberg and Smith, 1997; Card and Krueger, 1996).[7] Moreover, the most rapid increase in wages happens early in an individual's working life, reflecting the accumulation of on-the-job training, and levels off later in life (Ehrenberg and Smith, 1997). It is well known, however, that two individuals will often earn different wages even with the same level of education, the same labor market experience, and the same demographic characteristics. Returns to education are discussed in much greater detail in Chapter 8.

2.2. School Quality

School quality may also influence wage rates, in addition to the overall amount of schooling. The empirical evidence of the effect of school quality on earnings is mixed. The

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[7] Data shown in Ehrenberg & Smith (1997, pp. 300) are from the U.S. Bureau of the Census, Money Income of Households, Families and Persons in the United States, Current Population Reports P-60, no. 184, Table 30.

effect of school quality on earnings largely depends on the level at which school quality is examined. While the school quality has been found to have positive effects on earnings later in life when measured as the expenditure per pupil at the primary school level (Card and Krueger, 1996), the effects of school quality on earnings at the college level have not been clearly demonstrated (Long, 2008; Black and Smith, 2004).

Long (2008) used panel data from the National Education Longitudinal Study and estimated this relationship using Ordinary Least Squares (OLS) as well as three alternative methods of estimation, and concluded that the effect of college characteristics on earnings is weak regardless of the estimation technique used. Black and Smith (2004), on the other hand, found that two different estimation techniques generated different results. The authors used OLS and propensity score methodologies to estimate the return to college quality with a different data set. A similar measure of college quality was used; namely, college quality was measured as an index composed of four college qualities: peer quality / selectivity of the college, net tuition, and faculty quality and availability. Black and Smith (2004) estimated this effect for the 1979 cohort of the National Longitudinal Survey of Youth and found that while the OLS regression produced a significant effect of school quality, the propensity score estimation method suggested the effect of college quality on earnings was not statistically significant.

2.3. <u>Family Background</u>

A sizeable body of studies has documented that if measures of parental success such as occupation, education, or income are included in the wage rate function, these variables remain significant even after controlling for an individual's years of education and labor market experiences; a review of this literature is available in Bowles and Gintis (2001).

For example, Mulligan (1999) used the National Longitudinal Study of Youth and found that an estimate of parental income is a statistically significant predictor of the natural logarithm of the hourly wage rate of individuals in 1990 and 1991. The author used the standard earnings model that controls for education, work experience and demographic variables. In addition, the author controlled for a large number of measures of school quality including the Armed Forces Qualification Test (a cognitive test developed to predict vocational success).

One explanation for the effect of family background on an individual's wage rates is that successful parents pass on to their children better genetics in terms of better cognitive abilities and therefore children of more successful parents will generally have higher wage rates, beyond what is associated with higher level of education (Devlin et al., 1997). In addition, successful parents have the monetary ability to provide education of higher quality for their children because they themselves have higher wages.

2.4. Individual Characteristics

Differentials in wages by gender have been studied intensively. A review of this literature is presented in Chapter 8.

Student characteristics that are typically not measured in surveys, such as a student's ambition, can play an important role in determining their earnings in adulthood, as documented by Dale and Krueger (2011). The authors used the College and Beyond (C&B) Survey linked to the Detailed Earnings Records from the Social Security Administration (SSA) to estimate the monetary return to attending an ambitious (i.e., highly selective) college for two cohorts of students: those who entered college in 1976, and those who entered in 1989. They estimated regression models controlling for variables measured in the data such as student high school GPA and SAT scores, as well as *ability* as captured by the average SAT score of the colleges to

which students had applied. The authors found that the returns to college selectivity remained large for students who come from less-educated families, measured by their parents' education, as well as for black and Hispanic students. The authors explained these results as reflecting the access to networks that highly selective colleges provide for students from disadvantaged or minority family backgrounds; such networks would not otherwise be available to these students.

A few research articles have examined *physical appearance* as a factor of determining wages. Customers might prefer to deal with better looking individuals in some occupations. The physical attractiveness might improve the worker's ability to engage with coworkers and be more productive in other occupations. To test this hypothesis, Hamermesh and Biddle (1994) estimated a wage rate equation that included a variable on the individual's looks, measured by the interviewers' ratings of the respondents' physical appearance. The authors found that, *ceteris paribus,* wages of individuals with average appearance were higher than wages of individuals with below-average looks; i.e., they found a wage premium for good-looking people.

2.5. <u>Religious Affiliation</u>

Individuals affiliated with various religions differ in two factors that are important to determining their wage rates: their educational attainment and, in the case of women, labor force participation rates. Empirically supported theoretical reasons for these differences have been developed in several studies (Chiswick, 1988; Glass and Jacobs, 2005; Lehrer, 1999; Sherkat, 2000). Thus, differences in wage rates among religious groups are expected and not surprising (Lehrer, 1999; 2010).

Empirical studies that have examined the effect of religious affiliation on wages are limited. Several studies have found that white Jewish men have higher earnings than white men

from other religious groups (Chiswick, 1993; Chiswick, 1999; Steen, 2004). [8] Lehrer (2010) found that the effects of childhood religious affiliation on wages in adulthood mirror the effects on educational attainment distribution for non-Hispanic white women; namely, MPs and Catholics are at the center of the distribution, CPs have lower wage rates, and Jews have higher wage rates. Furthermore, Lehrer (2010) documented that substantial differences in wage rates among religious groups remain after controlling for years of education and labor market experience. The author suggested that the "high wages of Jews may in part reflect a higher level of schooling quality, social capital that is helpful in the labor market, and a tendency to reside in large metropolitan areas" (p. 202). The relatively low wages of CPs, on the other hand, as suggested by Lehrer (2010), may be a consequence in part of the greater asymmetry in the intra-household division of labor—with wives spending more time on household work (Ellison and Bartkowski, 2002). Other studies have suggested several other factors such as disadvantaged social networks (Massengill, 2008; Sherkat, 2010) and occupational choices (Sherkat, 2012; Keister, 2011) that may have a detrimental effect on the wages of CPs. In addition, CPs often view the Bible as the inerrant word of God, and this leads them to view a large accumulation of wealth as undesirable (Keister, 2011).

2.6. **Religious Participation**

Religious participation is an important part of religiosity that could influence wage rates. The effect of religious participation on wage rates and other socioeconomic outcomes is rather

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[8] Steen uses "Protestants" as reference group, with CPs and MPs lumped into one category. Relevant comparison is impossible as other studies have found significant differences between CPs and MPs in terms of other socioeconomic outcomes. Numerous studies have found that CPs have relatively low educational attainment (Darnell and Sherkat, 1997; Sherkat and Darnell, 1999; Lehrer, 1999), and that CP women with young children have low levels of employment (Lehrer, 1995; Sherkat, 2000; Glass and Jacobs, 2005; Glass and Nath, 2006; Lehrer and Chen, 2012).

complex and multifaceted. On the one hand, some religious participation can enhance the effect of religious affiliation—for some religions this might encourage individuals to seek high wages, and for others this might instead encourage investment in family and religious activities. On the other hand, religious participation can have beneficial effects such as helpful social networks, psychological benefits and the promoting of healthy behaviors that can improve an individual's well-being. Only two studies have examined the link between religious participation and wages. Lehrer (2010) found that, *ceteris paribus*, religious participation had little or no effect on women's wages among Catholics, CPs and MPs. Chiswick and Huang (2008) used a specification that allowed for non-linearities, and found that Jewish men who attended religious services weekly had significantly higher earnings than those who attended religious services less frequently; however, those who attended religious services more often than weekly had lower earnings than those who attended weekly.

These effects are discussed in more detail in Chapter 9, which focuses on the relationship between religious participation and wages.

3. THE ROLE OF RELIGIOUS AFFILIATION IN INFLUENCING OTHER SOCIOECONOMIC OUTCOMES

Although studies on the relationship between religion and wage rates have been limited, researchers have recently shown an increased interest in the importance of religion and its influence on other demographic and socioeconomic outcomes such as education, level of employment, marriage, divorce, family size, wage rates and wealth accumulation. As a result, there have been several reviews of the existing literature about religion and demographics. Iannaccone (1998) reviewed the literature related to the economics of religion, covering the period before 1998. He placed the review in the context of the overall economics of religion literature and emphasized the importance economic theory may play in studying the economics of religion. In his words, "the best prospects for progress in the scientific study of religion rest in the marriage of economic theory and sociological data" (p. 1491).

Lehrer (2004a) offered an extensive review of the literature on the role of religion in human capital investments and presented an analytical framework for studying these relationships. She subsequently updated this literature review and included more recent research findings (Lehrer, 2009; 2011). Keister (2003; 2011; 2012) examined the relationship between religious affiliation and wealth. This section of the dissertation is largely based on these studies. The main research findings are summarized in the following sections of this chapter.

3.1. Educational Attainment

Differences in educational attainment between religious groups have been documented in existing research, although there is more evidence for MPs, CPs, Jews and Catholics than for Mormons and those who are not religiously affiliated. The level of schooling has been shown to be relatively high for Jews (Chiswick, 1993; Lehrer, 1999; 2010) and relatively low for CPs

(Darnell and Sherkat, 1997; Sherkat and Darnell, 1999; Lehrer, 1999). MPs and Catholics are at the center of the educational distribution (Lehrer, 1999). A convergence of non-Hispanic Catholics to the MP pattern has also taken place in other demographic and economic behaviors and outcomes, as highlighted in subsequent sections.

Mormons have emphasized and promoted education from the beginning (Albrecht and Heaton, 1984). The church maintains and manages a system of seminaries and institutes that focus on educating Mormon adolescents and young adults, including the Brigham Young University (Shaefer and Zellner, 2007). Few studies have examined Mormons because of the usually small sample size in most available data sets. The empirical findings about the educational and labor market achievements of Mormon women are somewhat mixed—Keysar and Kosmin (1995) found that Mormon women are at the middle of the educational distribution while Lehrer (2010) reported that Mormon women have wage disadvantage. Empirical findings also suggest that there may be gender differences in the educational achievements. Keister (2011) reported that mothers of Mormon respondents have lower educational attainment, while fathers had an educational level at about the sample mean. Keister (2011) also notes that Mormon leaders have been promoting education more strongly in recent years for both men and women (p. 184).

The findings have also been mixed with regard to the religiously unaffiliated group. [9] Multivariate analyses have generally reported relatively low educational attainment (Lehrer, 2010; Glass and Jacobs, 2005; Keysar and Kosmin, 1995) for the religiously unaffiliated. Other studies have noted that a high percentage of academics report that they are not religiously

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[9] Children who were raised in families with no religious affiliation had no involvement in institutionalized religion (Glenn, 1987). However, it is possible to believe in the supernatural and have personal spiritual experiences outside of religion in the institutional context (Stark and Bainbridge, 1985).

affiliated (Stark et al., 1996; Iannaccone, 1998; Stark and Finke, 2000)—and academics clearly have very high educational attainment levels. The inconsistent findings reflect the fact that there is a high level of heterogeneity within the unaffiliated group; and moreover, there have been changes over time in the composition of this group (Massengill and MacGregor, 2012).

3.2. Family Decisions: Cohabitation and Marriage, Fertility and Female Employment Level

Over the life cycle, individuals make important decisions such as when to marry, whether to cohabit prior to marriage, whether and how many children to have and whether to work or stay out of the labor force to raise their children. Various aspects of the individual's family background, including religion, can influence these decisions. Numerous studies have documented a significant relationship between religious affiliation and the timing of marriage and cohabitation. The probability of early marriage is lowest for Jews; highest for CPs and Mormons; and MPs, Catholics and the unaffiliated are at the center of the distribution (Lehrer, 2004a).

Cohabitation rates are related to the timing of marriage. CPs enter marriage earlier but are less likely to cohabit (Fitzgerald and Glass, 2008; Glass and Jacobs, 2005; Lehrer, 2004a; Uecker and Stokes, 2009). Cohabitation rates are highest for the non-religiously affiliated group and lowest for Mormons (Lehrer, 2004a). While Jews enter their first marriage later (Lehrer, 2004a), there have been mixed results in the literature regarding their likelihood to cohabit. While some studies have found that Jews have high rates of cohabitation (Lehrer, 2000; Willis and Michael, 1994), other studies have found that the rates of cohabitation for Jews are not significantly different from the rates of cohabitation of their MP counterparts (Lehrer, 2004a).[10]

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[10]Small sample size may be the reason of the low statistical significance in this study (Lehrer, 2004a).

Female employment levels also vary across religious groups, reflecting differences in norms regarding the intra-family division of labor. For example, although there is heterogeneity among CP denominations, CP groups "generally provide psychological rewards and institutionalized moral support to women who stay home with their young children" (Lehrer, 2009, p. 179). Consistent with these incentives, studies have documented a relatively low labor supply of CP women with young children (Lehrer, 1995; Sherkat, 2000; Glass and Jacobs, 2005; Glass and Nath, 2006; Lehrer and Chen, 2012). Female employment for Mormons has also been found to be relatively low (Heaton and Cornwall, 1989). Jewish women also have low employment when young children are present, but at other stages of their life cycle their employment level is high (Chiswick 1986; Hartman and Hartman, 1996). Research that has examined the role of religion in labor force participation for men is limited perhaps because "it is unusual for prime-aged men to depart from a pattern of full time work" (Lehrer, 2009, p. 221).

Religious groups also differ in fertility, in part because some religions provide "psychological and social rewards to couples who have many children, in the form of approval, social status, and blessings" (Lehrer, 2004a, p. 711). The higher fertility rates of Mormons (Heaton, 1986; Lehrer, 1996) may be due to these incentives (Stark and Finke, 2000). Similarly, the Catholic Church "embodies strong pronatalist ideologies that raise the perceived benefits of having an additional child" (Lehrer, 2004a, p. 711); in addition, the Catholic Church prohibits "artificial" forms of contraception and abortion (Sander, 1995) that may increase the fertility rates. Recently, however, the Catholic Church has weakened. There has been a decline of the birth rate in Catholic families (Goldscheider and Mosher, 1991), and non-Hispanic Catholics have converged to the MP patterns in various socioeconomic and demographic behaviors and outcomes (Lehrer, 2004a) including fertility (Lehrer, 1996).

Higher fertility rates have also been documented for CPs, by a small margin compared to MPs (Lehrer, 1996). Jews, consistent with other economic and demographic outcomes, are at the other end of the distribution, with low fertility rates (Della Pergola, 1980; Mosher and Hendershot, 1984). Judaism, however, does not encourage small family size. The economic literature has therefore discussed the higher price of having an extra child because of the higher rates of urbanization and female educational levels of Jews (Lehrer, 2004a) and the substitution of quality measured by expenditure per child versus quantity of children (Chiswick, 1988; Lehrer, 2004a) as possible explanations for low fertility rates among non-Orthodox Jews.

Lehrer (2004a) also discussed the importance of the husband's religious affiliation and religious intermarriage in the fertility and female employment decisions. Studies of intra- and inter-faith unions have found that Catholic and Mormon women who marry outside their religion have significantly lower fertility, compared to their counterparts in homogamous marriages (with partners who belong to the same religious group) (Lehrer, 1996). In addition, among married CP women with young children, those in homogamous unions were less likely to participate in the labor force compared to similar women in heterogamous marriages (Lehrer, 1995).

3.3. <u>Marital Stability and Marriage Dissolution</u>

The religious compatibility of marital partners plays a major role in marital stability. Becker (1973) developed a model showing that positive assortative mating is optimal for traits that are complementary in the context of marriage. Religion is such a trait because it affects many activities that husband and wife do jointly, including the raising of their children. Religiously heterogamous marriages are thus expected to be less stable, other factors held constant.

Building on Becker's (1973) theory, Lehrer and Chiswick (1993) used the 1987–88 National Survey of Families and Households to examine differences in divorce rates between religiously homogamous and heterogamous couples. They found that heterogamous marriages were characterized by a higher probability of marriage dissolution than homogamous marriages. The authors also discussed how the magnitude of the destabilizing impact of religious heterogamy varies with the degree of divergence between the two partners' religious doctrines.

To the extent that possible marriage dissolution affects labor force participation rates, religious intermarriage would have an indirect effect on wages; however, examination of this phenomenon is outside the scope of this dissertation.

3.4. <u>Wealth Accumulation</u>

Religious affiliation affects wealth indirectly through its impact on education, fertility, marriage, female employment and social networks (Keister, 2005). Through valuable social contacts, religion may provide tools that can develop an individual's saving and investment strategies (Keister, 2005). The disadvantaged social networks of CPs can have the opposite influence (Sherkat, 2010; 2012). Religious affiliation can also affect wealth accumulation directly by "identifying valuable goals, by providing a set of competencies that direct strategies of action" (Keister, 2003, p. 175; Keister, 2011). Empirical research has documented that Jews are at the highest end of the wealth accumulation distribution, while CPs are at the lowest. MPs and Catholics are at the center, and not significantly different from each other (Keister, 2003). These patterns mirror the differentials among religious groups in education as discussed in Chapter 3, Section 3.1.

4. THEORY AND METHODOLOGY

Religion may affect wage rates through two pathways: *indirectly* through education, labor market experiences and other additional effects such as religious social capital and social networks that may have different effects on wages; and *directly* through differences in religious teachings that pertain to wages and financial success. This chapter presents the theoretical reasons for indirect and direct effects of religion on wages, followed by a discussion about the empirical methodology and the model specification used in this study.

4.1. Theoretical Framework[11]

4.1.1. Indirect Effects of Religion on Wages

4.1.1.1. Through Education

The human capital model developed by Becker and Chiswick (1966) has been used in analyzing the various channels through which religion may influence educational decisions (Chiswick, 1988; Lehrer, 1999). This model describes the optimal decision individuals make regarding their investment in schooling, and one of its main purposes is to provide a way to test hypotheses about why certain groups have especially high or low schooling levels. This model is described by the supply of funds for education and the demand for education. The supply of investment funds for schooling, or the supply curve, represents the relationship between schooling on the horizontal axis and the marginal interest cost of funds on the vertical axis. The supply curve is drawn with a positive slope assuming that additional funds for education are increasingly more expensive as more schooling investments are undertaken. The demand curve, on the other hand, represents the marginal rate of return derived from each additional dollar

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[11] This thesis focuses on examining specifically the labor market wage rate differentials between religious groups. Home production of course also has value which is not examined in this thesis.

invested in schooling. It has a negative slope because as an individual acquires more schooling, the cost in terms of forgone earnings increases. The individual makes the optimal decision of financing the optimal level of schooling by setting the marginal interest cost of funds equal to the marginal rate of return (see Figure 1).

In the context of this study, this framework can be useful to test competing hypotheses about why some religious groups have high levels of schooling while other religious groups have low levels of schooling. When the rate of return to education is estimated, this model sheds light on whether demand or supply forces are more important in explaining the observed differences in educational attainment across religious groups.

Figure 1. Supply and demand of funds for investment in schooling. Equilibrium level of schooling is E_o where marginal interest cost of funds is equal to marginal rate of return.
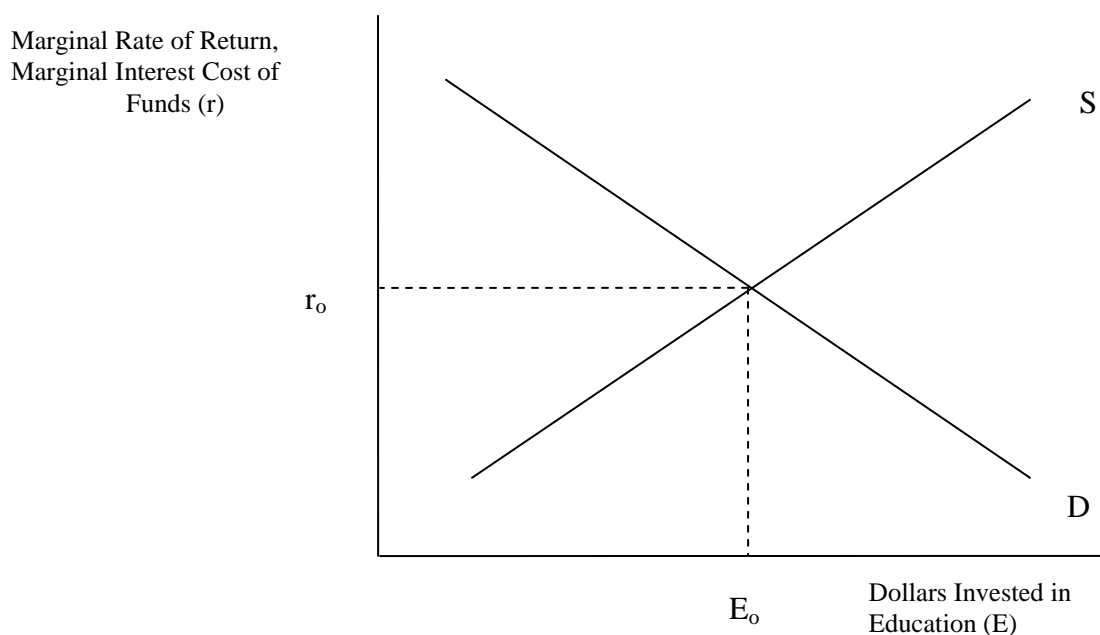
Sources: Becker and Chiswick (1966); Chiswick (1988); Lehrer (1999).

A number of factors may affect the position of the supply and the demand curves. The supply curve would be farther to the right if more funds were supplied for the same interest cost of funds. Individuals with access to cheaper sources of funds would therefore have a supply curve farther to the right. For example, wealthier individuals who can finance schooling on their own would have a supply curve that is farther to the right compared to those who borrow funds for education (Lehrer, 1999).

The demand curve would be higher or farther to the right for those with greater innate ability or those with higher human capital acquired at home; i.e., those who were raised in a family with greater focus on quality of children, and also for those with access to schooling of a higher quality.

The optimal investment in education is determined by the relative position of the supply and demand curves. Religion may influence the relative positions of the supply and demand curves based on cultural differences between religious groups, and may therefore lead to differences in educational attainment and returns to education between these groups. Differences in the position of these curves for Jews (Lehrer, 2010; 1999; Chiswick, 1988); CPs and Catholics (Lehrer, 2010; 1999); and Mormons and the no religion group (Lehrer, 2010) have been discussed relative to MPs in previous studies and are briefly summarized in the following sections.

Jews

The curves for both the supply of funds and the demand for education of Jews may be to the right of those of their MP counterparts. The supply of funds for education of Jews may be to the right of the supply of other religious groups because of the diaspora hypothesis (Chiswick, 1988). For historical reasons, Jews have often felt insecure in their place of residence, preferring

to invest in capital that is more easily transferable—such as human capital. This implies that the curve for the supply of funds for education of Jews is to the right of the curve for their MP counterparts. This effect implies higher education, but also a lower equilibrium rate of return to education.

The demand curve for education of Jews may also be to the right of the demand curve for MPs because Jews have lower fertility levels (Della Pergola, 1980; Mosher and Hendershot, 1984) and lower female employment levels when they have young children (Chiswick, 1986; Hartman and Hartman, 1996) than their MP counterparts. Fewer children and lower labor market participation of mothers imply higher investments in child quality, which increases the productivity of formal education and leads to a demand curve that is farther to the right than the demand curves of other religious groups.

The factors affecting the supply of funds for education as well as the demand for education operate simultaneously, and both imply higher educational levels of Jews. However, the equilibrium rate of return to education will depend on the relative magnitude of the two effects. Empirical results show that Jews have higher educational levels compared to MPs (Lehrer, 1999; 2010) and other whites (Chiswick, 1993; Lehrer, 1999); they also have higher rates of return to education (Chiswick, 1988; Meng and Sentance, 1984; Tomes, 1985). The finding that their returns to education are higher has been interpreted by Chiswick (1988) and Lehrer (1999) as suggesting that demand forces are dominant in explaining the high achievement of Jews, as shown in Figure 2.[12]

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[12] Note that for simplicity the supply curves for different groups are drawn as parallel, and similarly the demand curves are drawn as parallel. But differences in elasticity and shape across groups are possible. However, these differences will not affect the main conclusions.

Figure 2. Supply and demand of funds for investment in schooling for Jews relative to the
reference group, mainline Protestants
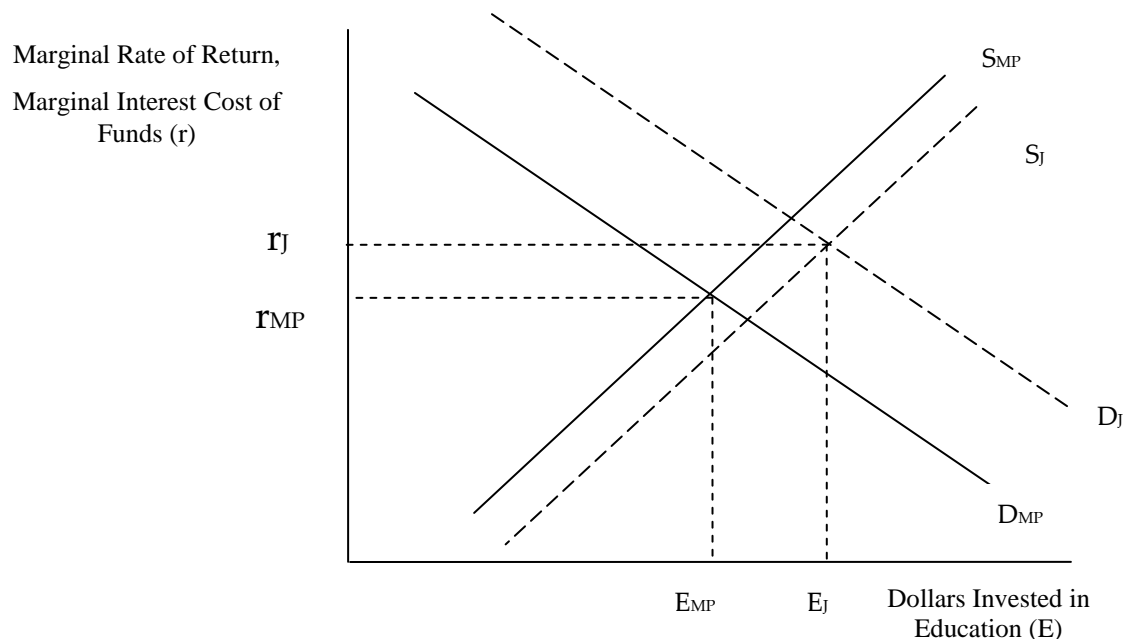
Note: Equilibrium level of schooling for Jews is E_J, which is higher than the equilibrium level of schooling for MPs, E_{MP}. Equilibrium rate of return to schooling for Jews is r_J, which is higher than the rate of return to schooling for MPs, r_{MP}.

Source: Lehrer (1999).

Conservative Protestants

The supply curve for investment in schooling of CPs may be to the left of the supply

curve of MPs due to several reasons. CPs tend to interpret the Bible literally (Darnell and

Sherkat, 1997), which leads to reservations toward the scientific method. In addition, CPs tend

to oppose secular education, and at the same time face limited opportunities to attend religious

educational institutions (Lehrer, 1999). These forces work together and shift the supply of funds

for investment in education further to the left compared to MPs.

Two opposite forces may affect the demand curve for investment in education. On one

hand, CPs have more traditional views regarding the division of labor within the family (Lehrer,

2010, p. 201) and CP women with young children display lower labor force participation rates

(Lehrer, 1995; Sherkat, 2000; Glass and Jacobs, 2005; Glass and Nath, 2006; Lehrer and Chen, 2012) than MPs. This factor may imply greater home investments in child quality during the formative years (Lehrer, 1999). On the other hand, CPs have higher fertility rates (Lehrer, 1996), which may offset this effect (Lehrer, 1999).

Productivity of schooling effects may be the dominant demand force in this population, implying a demand curve positioned farther to the left. CPs' "authoritarian approach to knowledge and [their] rejection of critical inquiry and unconventional modes of thinking" may decrease the productivity of formal schooling (Lehrer, 1999, p. 364). Furthermore, a difference between men and women may be expected in the potential productivity of schooling, because of the traditional intra-family division of labor and the shorter work history of women (Lehrer, 1999).

The supply and demand forces described above both predict that CPs will have lower levels of education, a result that has been found in numerous studies (Sherkat and Darnell, 1999; Sherkat, 2012). Empirically, it is possible to evaluate the relative strength of the demand and supply forces by estimating the rate of return from investment in schooling. Lehrer (1999) estimated that the rate of return to schooling for CPs is not significantly different from the rate of return to schooling for MPs, which suggests that the overall supply and demand forces are of similar magnitude as shown in Figure 3.

Figure 3. Supply and demand of funds for investment in schooling for conservative Protestants
relative to the reference group, mainline Protestants
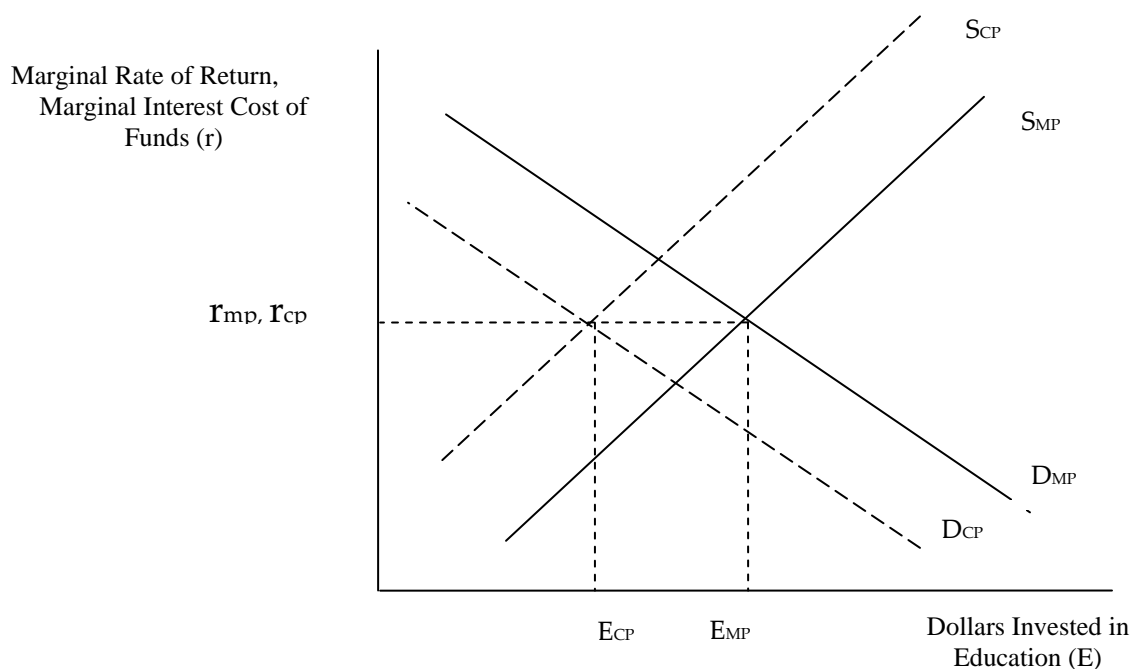
Note: Equilibrium level of schooling for CPs is E_{CP}, which is lower than the equilibrium level of schooling for MPs, E_{MP}. Equilibrium rate of return to schooling for CPs is r_{CP}, which is lower than the rate of return to schooling for MPs, r_{MP}.

Source: Lehrer (1999).

Catholics

Empirical studies have found that MPs and non-Hispanic Catholics are not significantly

different from each other in terms of educational attainment (Lehrer, 1999) and they are also

similar today in most other dimensions of economic and demographic behavior. It is therefore

hypothesized that the supply and demand curves would be similar for these two groups, as shown

in Figure 4. There are a few studies that have estimated higher returns to schooling for Catholics

compared to their Protestant counterparts (Kortt and Dollery, 2012; Steen, 1996; 2004).

Unfortunately, these studies do not separate Protestants into the two groups—conservative and

mainline. CPs and MPs are different in a number of socioeconomic outcomes as demonstrated

by a number of studies cited in this chapter, and therefore the studies by Kortt and Dollery

(2012) and Steen (1996; 2004) do not contribute to the theoretical framework for the analyses in

this thesis. [13]

Figure 4. Supply and demand of funds for investment in schooling for Catholics relative to the
reference group, mainline Protestants
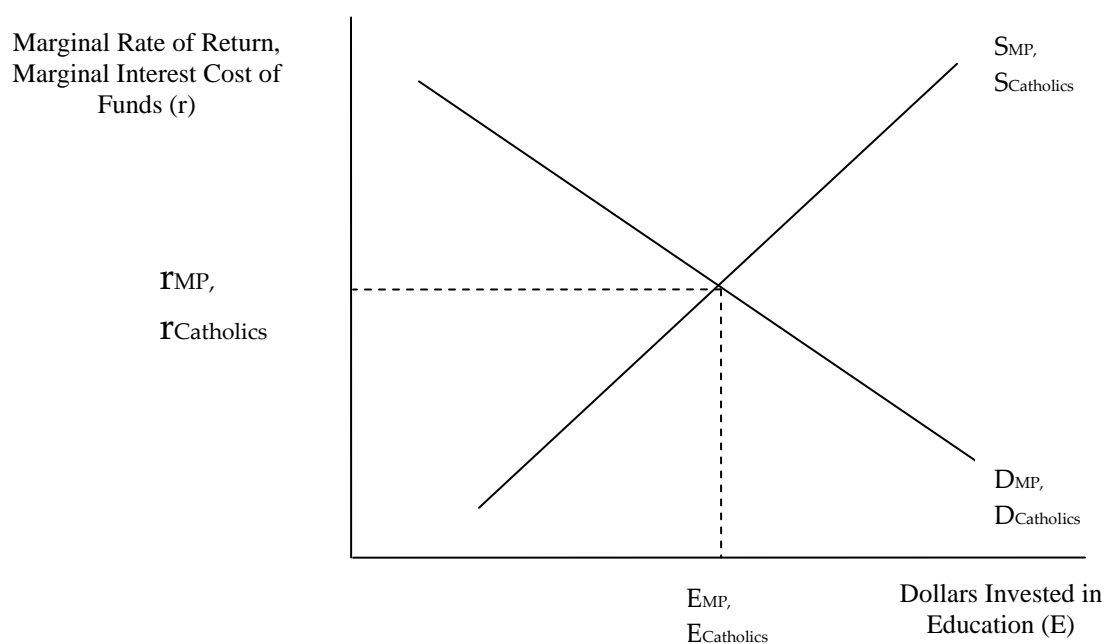
Source: Lehrer (1999).

Mormons

For Mormon men, the supply curve for investment in schooling is expected to be farther

to the right than the supply curve of MPs, given the strong, long-standing emphasis of the

Mormon church on education (Albrecht and Heaton, 1984; Keister, 2011). The demand curve

for education of Mormons, however, is likely farther to the left given the strongly pronatalist

nature of the religion; Mormons have fertility rates that far exceed fertility rates of MPs (Heaton,

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[13]See the Literature Review Chapter for references regarding differences in education as well as other
socioeconomic outcomes.

1986; Lehrer, 1996). This can be shown graphically as illustrated in Figure 5. If supply and demand forces are of similar magnitude, this would imply schooling level of Mormon men similar to schooling level of MP men, consistent with recent findings in the literature (Keister, 2011, p. 183).

Mormon women, however, have substantially lower rates of labor force participation (Heaton and Cornwall, 1989) than their MP counterparts, implying that their investments in schooling have a low payoff. The supply and demand for schooling for Mormon women may look as depicted in Figure 6. This analysis suggests low educational attainment for Mormon women compared to their MP counterparts, consistent with recent research findings (Keister, 2011, p. 183).

Figure 5. Supply and demand of funds for investment in schooling for Mormon men relative to the reference group, mainline Protestants
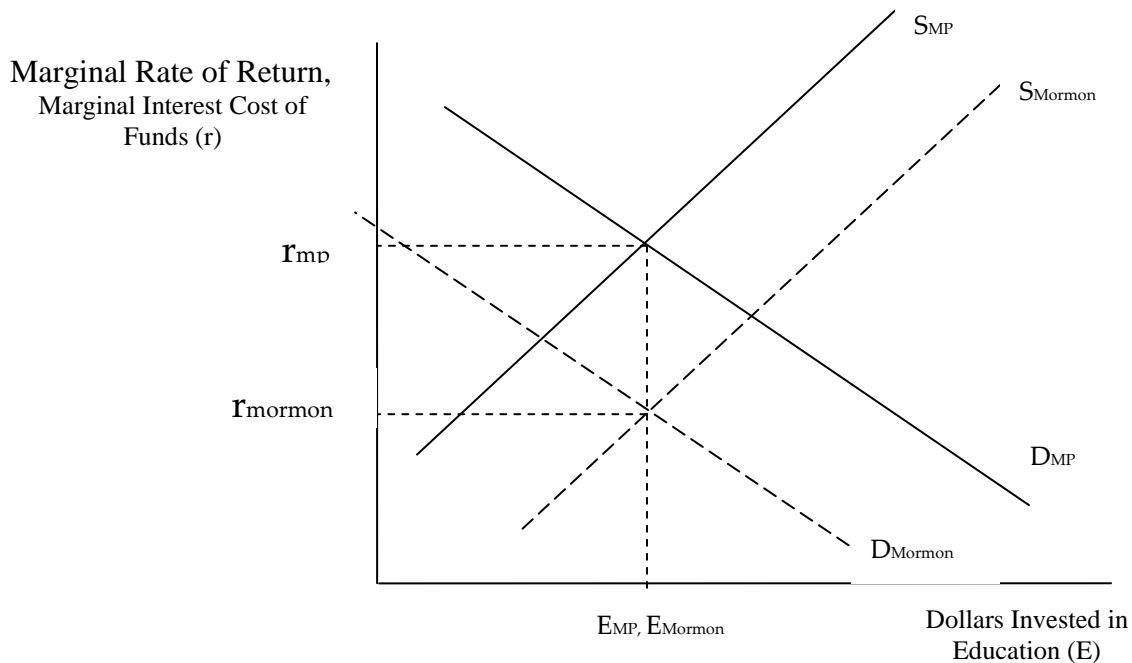
Note: Equilibrium level of schooling for Mormon men is E_{Mormon}, about the same as the equilibrium level of schooling for MPs, E_{MP}. Equilibrium rate of return to schooling for Mormon men is r_{Mormon}, lower than the rate of return to schooling for MPs, r_{MP}.

Figure 6. Supply and demand of funds for investment in schooling for Mormon women relative
to the reference group, mainline Protestants
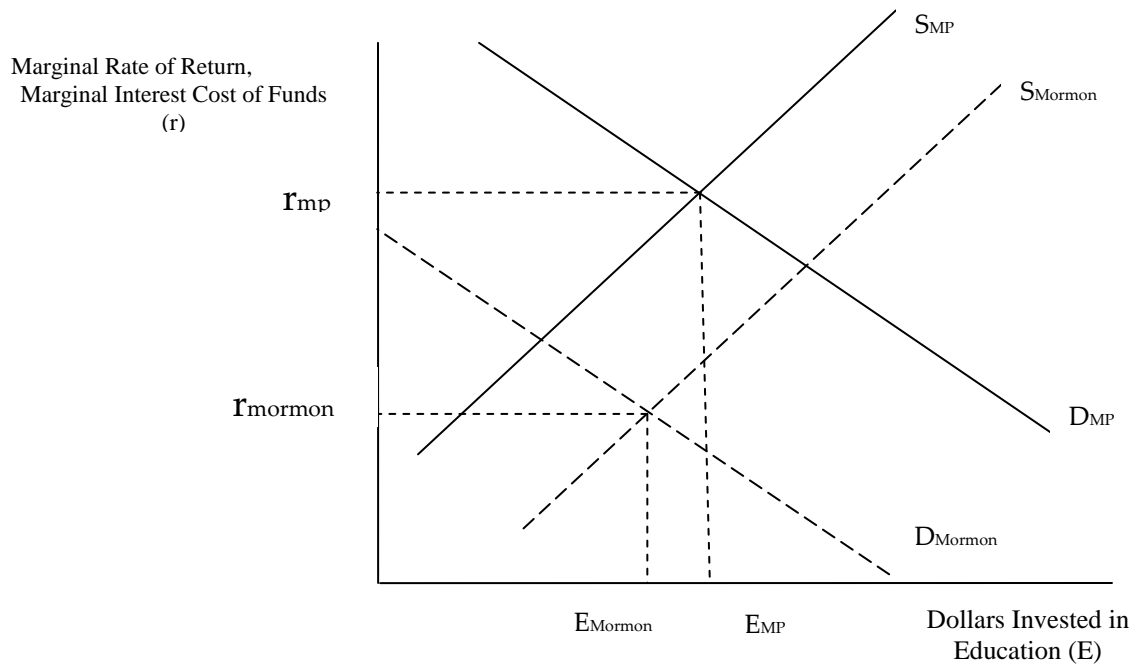
Note: Equilibrium level of schooling for Mormon women is E_{Mormon}, lower than the equilibrium level of schooling
for MPs, E_{MP}. Equilibrium rate of return to schooling for Mormon women is r_{Mormon}, lower than the rate of return to
schooling for MPs, r_{MP}.

The no religion group

The supply and demand forces for the no religion group are expected to be mixed

because of the diverse nature of the religiously unaffiliated group, which includes agnostics,

atheists, and people who do not belong to any religious group (Roof, 1999; Massengill and

MacGregor, 2012). Most empirical studies have reported relatively low educational attainment

(Keysar and Kosmin, 1995; Glass and Jacobs, 2005; Lehrer, 2010) for the religiously

unaffiliated; but other studies have found that a high percentage of academics, who obviously

have high education, report that they are not religiously affiliated (Stark et al., 1996; Iannaccone, 1998; Stark and Finke, 2000).

4.1.1.2. <u>Through Labor Market Experiences</u>

Religion may affect the labor force participation rates of women because of differences in attitudes toward gender roles and the division of labor within the family, which influence years of labor market experience, and hence wages. Studies examining differences in labor force participation rates among women have documented a relatively low labor supply of CP women with young children (Lehrer, 1995; Sherkat, 2000; Glass and Jacobs, 2005; Glass and Nath, 2006; Lehrer and Chen, 2012) and of Mormon women overall (Heaton and Cornwall, 1989). Jewish women on the other hand have relatively high employment levels, except when young children are present (Chiswick, 1986; Hartman and Hartman, 1996).

4.1.1.3. <u>Other Indirect Effects</u>

Social networks developed through one's religion may affect wages positively or negatively. For example, the helpful social contacts of Jews have been recognized as a contributing factor to their advantage in terms of wages, educational attainment, wealth accumulation, and other socioeconomic measures (Keister, 2003; Lehrer, 2010). In contrast, the social networks of CPs have been identified as possibly contributing to their disadvantage in the labor market (Massengill, 2008; Sherkat, 2012).

Differences across religious groups in gender role ideologies may also contribute indirectly to wage differentials. For example, CP families are characterized by a greater asymmetry in the intra-household division of labor and women spend more time on household work. The result may be lower productivity on the job and lower wages due to a decrease in the level of energy left for market work (Ellison and Bartkowski, 2002). In addition, women with

heavier childcare and household responsibilities may seek jobs that are more convenient, require less energy, and pay lower wages (Becker, 1985). These effects will lead to a negative influence on wages for CP women and those in other conservative religious groups with similarly traditional gender roles (e.g., Mormons).

4.1.2. Direct Effects of Religion on Wages

Teachings specific to a particular religious group related to financial success and earnings may have a direct effect on individuals' wages. This effect could be positive or negative. For example, the doctrines and teachings of the Jewish religion promote success in this life. This may have positive effect on wages, as monetary gains, high levels of wages and wealth accumulation are examples of achievements in this life (Burstein, 2007).

In contrast, the teachings and values regarding work and money of the CP church may have opposite effect on wages as CPs consider money to "belong to God and, as a result, they seek divine guidance in managing money and avoid accumulation" (Keister, 2008, p. 1264). CPs tend to interpret the Bible literally and tend to dismiss the possibility that material and spiritual well-being may coexist. CPs believe that too much focus on material well-being will be at the "expense of spiritual well-being, as articulated in Luke 16:10–13: 'No servant can serve two masters….You cannot serve both God and Money'" (Keister, 2011, p. 76). For CPs, it is not necessary to "accumulate worldly possessions because God will take care of believers after they die" (Keister, 2011, p. 76).

The Mormon Church has promoted the belief that financial success has a spiritual value since the establishment of Mormonism in 1830. Investing in profitable businesses is encouraged and the Mormon doctrine does not differentiate between the spiritual and the material. As Mormon historian D. Michael Quinn—who is writing a book about the Mormon Church's

finances and businesses—eloquently puts it, "it's as spiritual to give alms to the poor,...as it is to

make a million dollars" (in Winter, 2012). In addition, the many church owned for-profit

businesses are managed by Mormon executives who are "likely [to] hold salaries comparable to

what they'd receive in the secular world" (Winter, 2012). These teachings and practices of the

Mormon religion are expected to have a direct positive influence on the earnings of Mormons.

4.2. The Model: The Human Capital Earnings Function

    4.2.1. Empirical Methodology

To examine the relationship between religion and wage rates, the Human Capital

Earnings Function (HCEF) developed by Mincer (1974) is used as the framework of analysis. In

the basic HCEF, the natural logarithm of wages is modeled as the sum of a linear function of

years of education and a quadratic function of years of potential labor market experience. The

HCEF is enhanced to include religion as a determinant of wages. The reduced form of the model

is as depicted in equation (1): $WAGE_i$

$$ln(WAGE_i) = \beta_0 + \sum_{m=1}^{k-1} \beta_{1m}RELIGION_i + \sum_{j=1}^{l-2} \beta_{2j}X_{ij} + \varepsilon_i \tag{1}$$

where $WAGE_i$ represents the hourly wage rate of individual i. $RELIGION_i$ represents k - 1

dichotomous variables indicating the religious affiliation of individual i (the MP category is

withheld as benchmark). X_{ij} represents l - 2 control variables: the individual i's years of

schooling, years of labor market experience, geographical region of residence and rural

residence. The years of schooling and the labor market experience are continuous variables; the

region of residence is a dichotomous variable for each region (the South region is withheld as

benchmark); and the rural residence is a dichotomous variable for rural effect (urban residence is withheld as benchmark). The ε_i is the error term and the βs are parameters to be estimated.

Because WAGE is observed only for employed individuals who earn positive wages, the effects for the population as a whole are not observed when estimating the wage equation, only for those individuals who are employed. Furthermore, the employed are those individuals for whom the market wage exceeds the reservation wage. The results would thus be biased when estimating the returns to education, labor market experience and the effects of religion on wage rates. Therefore, the inverse Mills ratio (IMR) was calculated in a separate regression based on the total population and included in the regression models to control for sample selection bias.[14]

The calculation of the IMR used the sample selection bias procedure developed by Heckman (1979).[15] Namely, the full sample was used to estimate the probability of employment using probit regression with employment, coded yes or no, as the dependent variable. The following explanatory variables were included: (i) all variables included in the wage model discussed above; and (ii) other variables that determine the probability of employment, namely the number of children in the household, presence of a child under five years old, marital status and other family income.

The final model estimated includes the IMR as additional explanatory variable and takes the following form:

$$ln(WAGE_i) = \beta_0 + \sum_{m=1}^{k-1} \beta_{1m} RELIGION_i + \sum_{j=1}^{l-2} \beta_{2j} X_{ij} + \gamma(IMR_i) + u_i \qquad (2)$$

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[14] The inverse Mills ratio is shown in the results tables as "Lambda".

[15] To calculate IMR, SAS version 9.2, procedure "QLIM" was used.

where IMR_i is the estimated probability of employment of an individual i; and u_i is the error term. The parameter γ measures the covariance between the residuals of the two equations: the selection equation (i.e., the probit equation) and the primary equation (i.e., the earnings equation). If there is no selectivity bias, the parameter $\gamma = 0$ (indicating that sample selection does not result in significant bias), and using OLS on the selected sample without including the IMR would be acceptable. If $\gamma < 0$ is statistically significant, then the error terms in the selection and primary equations are negatively correlated; thus the unobserved factors that make employment more likely tend to be associated with lower wages. Conversely, if $\gamma > 0$ is statistically significant, then the error terms in the selection and primary equations are positively correlated; thus the unobserved factors that make employment more likely tend to be associated with higher wages (Heckman, 1979; Vella, 1998).

4.2.2. __Model Specification Background__

The HCEF developed by Mincer (1974) has been tested throughout the past several decades and researchers have concluded that it remains a "parsimonious and relatively accurate way of modeling the relationship between earnings, schooling and experience. Its status as the 'workhorse' of empirical labor economic research on earnings determination is well deserved" (Lemieux, 2006b, p. 138).

Mincer (1974) developed theoretical reasons why the dependent variable in the standard earnings equation is specified as the natural logarithm of hourly wage rates. Empirically, numerous studies have used the standard specification regressing the natural logarithm of wage rate as dependent variable on education, work experience and other control variables as independent variables. Heckman and Polachek (1974) estimated a Box-Cox model and could not

reject the log specification. Many studies have added to the model a variety of dummy variables to control for various characteristics. For example, Chiswick and Huang (2008) used dummy variables to control for foreign birth, years since migration, marital status and occupation. Halvorsen and Palmquist (1980) provide a discussion of how the coefficients on dummy variables in the earnings function may be interpreted.

5. DATA SET, SAMPLE SELECTION AND VARIABLE CONSTRUCTION

5.1. Data Set

The analyses in this dissertation relied on the Panel Study of Income Dynamics (PSID), which is a longitudinal data set of a representative sample of U.S. individuals—men, women and children—and the family units in which they reside. The study was conducted at the Survey Research Center, Institute for Social Research, University of Michigan. The survey began in 1968 and continued on an annual basis from 1968 to 1997. Beginning in 1997 until the present, the survey has been conducted biennially.

The head of the family is interviewed each survey year. Information is collected about the household as well as each family member. Much detail is obtained about the head of the household—and, if married or cohabitating, about the spouse or the long-term cohabiter. The analyses in this dissertation included data about the individual for heads and spouses, meaning that no differentiation is made whether the individual is a head or a spouse. [16]

Detailed information regarding religion, including religious denomination, attendance at religious services, church contributions and church volunteerism, was collected starting with the 2003 survey year. For subsequent waves, information related to religion has been collected only for new heads and wives.

This study used wage rates, education, employment and demographic data from the 2005 survey year. All information related to religion is from the 2003 survey year, two years prior, which reduces, but does not eliminate, the problem of two-way causality in the wage regressions.

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[16] In the PSID, if a family contains a husband (or domestic partner for at least a year) and wife, the male is designated the "head" even if the female has the most financial responsibility, except when the male is incapacitated and unable to fulfill the functions of head.

Religious affiliation in 2003 would be inappropriate as a predictor of socioeconomic outcomes earlier in an individual's life, such as educational attainment and decisions pertaining to union formation, but is relevant for estimating adult achievement outcomes such as wage rates.

The PSID data set used in this thesis enabled the researcher to examine patterns for individuals between ages 27 and 64, which is a wider range than has been used previously to examine this topic. The previous study was restricted to the 27–44 age group (Lehrer, 2010).

5.2. <u>Sample Selection</u>

The PSID data, 2005 survey year, surveyed 8,002 families comprised of 22,911 individuals: men, women, and children of all ages and all marital statuses. The sample used for analysis was restricted by appropriate exclusions. A minimum age of 27 was chosen, as individuals younger than 27 are likely to have not yet completed their educational process (Lehrer, 2010). Likewise, a maximum age of 64 was chosen, as the retirement age for most individuals is 65. In addition, a sample of individuals with a maximum age of 44 was used in the first analysis to simulate previous analyses for non-Hispanic white women performed by Lehrer (2010). This provides information on whether Lehrer's results hold with a different data set and period.

Foreign-born individuals and observations with missing information of key variables such as education were excluded, as were those with unreasonably high wage rates. Additionally, observations for religious denominations with a very small sample size were excluded, namely individuals associated with Jehovah's Witnesses; Greek, Russian, and Eastern Orthodox; Protestant unspecified; other Protestant; and non-Christian religions such as Muslim and Rastafarian.

The final sample contains male and female individuals who are non-Hispanic whites.[17] The sample of African Americans was limited and they were also excluded from the sample as previous research suggests that the effects of religious affiliation and participation vary by race / ethnicity. For example, Lehrer (2006) found a similar probability of obtaining a high school diploma for Catholics and MPs among whites but not among African Americans. Hence, two sub-samples, non-Hispanic white women (WW) and non-Hispanic white men (WM) were analyzed.

A flow of exclusions for the two age group samples, 27 to 44 years old and 27 to 64 years old, is shown in Table I and Table II.

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[17] The sample of Hispanics was too small for robust analysis; thus, Hispanics were not included in the analyses in this study.

TABLE I

SAMPLE SELECTION CRITERIA AND FLOW OF EXCLUSIONS, ALL SUB-SAMPLES,
AGE 27–44 [a]

Sample Selection Criteria	# of Observations	# Dropped	% Dropped[b]
PSID 2005 survey data - all responders (men, women and children)	22,911		
Dropped if age < 18	15,793	7,118	31.1%
Dropped if age between 18 and 22	14,129	1,664	10.5%
Dropped if age between 22 and 27	12,058	2,071	14.7%
Dropped if age > 44	5,738	6,320	52.4%
Dropped if foreign born	5,191	547	9.5%
Dropped if education is missing	4,338	853	16.4%
Dropped if wage rate is outlier (too high)	4,310	28	0.6%
Dropped if from small religious denomination	3,977	333	7.7%
Dropped if not non-Hispanic White	2,498	1,479	37.2%
Dropped if not employed	1,924	574	23.0%

[a] Sample size for women is: $N_{Women} = 840$.

[b] % Dropped is calculated as # of dropped divided by the # of observations available at each step.

TABLE II

SAMPLE SELECTION CRITERIA AND FLOW OF EXCLUSIONS, ALL SUB-SAMPLES, AGE 27–64 [a]

Sample Selection Criteria	# of Observations	# Dropped	% Dropped[b]
PSID 2005 survey data - all responders (men, women and children)	22,911		
Dropped if age < 18	15,793	7,118	31.1%
Dropped if age between 18 and 22	14,129	1,664	10.5%
Dropped if age between 22 and 27	12,058	2,071	14.7%
Dropped if age > 64	10,483	1,575	13.1%
Dropped if foreign born	9,569	914	8.7%
Dropped if education is missing	8,273	1,296	13.5%
Dropped if wage rate is outlier (too high)	8,200	73	0.9%
Dropped if from small religious denomination	7,389	811	9.9%
Dropped if not non-Hispanic White	4,755	2,634	35.6%
Dropped if not employed	3,509	1,246	26.2%

[a] The final sample size of 3,509 is: $N_{Women} = 1,567$ and $N_{Men} = 1,942$.

[b] % Dropped is calculated as # of dropped divided by the # of observations available at each step.

5.3. Variable Construction

5.3.1. Religious Affiliation and Religious Participation

Two dimensions of religion were examined: religious affiliation and religious participation. *Religious affiliation* was constructed by grouping religious denominations into the following categories: conservative Protestants (CPs), mainline Protestants (MPs), Catholics, Jews, Mormons and unaffiliated (no religion). This structure follows the classification that has been used in earlier research (Lehrer and Chiswick, 1993). Following Steensland et al. (2000), Protestant unspecified and other Protestant were excluded from the analysis. A detailed list of denominations included in each religious affiliation category is shown in Table III.

TABLE III

RELIGIOUS AFFILIATION VARIABLE CONSTRUCTION [a]

Religious Affiliation Category	Religious Denomination
No religion	Not affiliated; Atheist / Agnostic
Catholics	Roman Catholic
Jews	Jewish
Mormons	Mormon
Mainline Protestants	Lutheran
	Methodist
	Presbyterian
	Episcopalian
	Unitarian, Universalist
	Quaker, Friends
	United Church of Christ, Congregational Church
	Reformed, Christian Reformed
Conservative Protestants	Baptist
	Christian
	Christian Science
	Seventh Day Adventist
	Pentecostal/Assembly of God
	Amish, Mennonite
	Church of God
	Churches of Christ
	Disciples of Christ, United Christian, First Christian, Christian
	Holiness

[a] Sources: Lehrer and Chiswick (1993); Steensland, et al. (2000).

The *religious participation* variable was defined based on attendance at religious services in 2003, two years prior to the survey. Earlier studies examining the effect of religious participation on economic outcomes have generally defined religious participation as a continuous variable or a simple dichotomous variable of high versus low participation. However, recent studies have defined religious participation to allow for detection of nonlinearities (Chiswick and Huang, 2008; Lehrer et al., 2009; Lehrer and Chen, 2012). The PSID data, survey year 2005, used in this dissertation has sufficient sample size to allow for detection of nonlinearities in the case of CPs, MPs and Catholics for both men and women.

Four categories of religious attendance were defined: very high, high, moderate/low and none. The definitions for religious participation categories are shown in Table IV.

TABLE IV

RELIGIOUS PARTICIPATION VARIABLE CONSTRUCTION

Religious Participation Category	Attendance
Very High	More than once a week
High	Once a week
Moderate / Low	Less than once a week, but not zero
None	Never attends religious services

5.3.2. Other Explanatory Variables

Aside from religion, other variables included in estimating the wage models were the number of years of school completed, labor market experience and geographical location of residence. Years of schooling is a continuous variable that indicates the years of completed education. Labor market experience is also a continuous variable: the number of years during which the individual was employed.

To control for geographical location, dummy variables for North East, North Central, West and South regions were included in the regressions. The South region was the reference category. A rural dummy variable was also included to control for residence in a rural area. In addition, to control for sample selection, an IMR was calculated using the full sample, employed and unemployed individuals, and then the IMR was included as a control variable in the wage equation.

5.3.3. Wage Rate

The dependent variable is the natural logarithm of the individual's hourly wage rate.

6. THE ROLE OF RELIGIOUS AFFILIATION IN INFLUENCING WAGES: EMPIRICAL FINDINGS BASED ON OLS REGRESSIONS

This section presents empirical findings based on Ordinary Least Squares (OLS) regressions. All analyses use data from the PSID, 2005 survey year. To examine gender differences, the sample was divided into non-Hispanic white women (WW) and non-Hispanic white men (WM). The influence of religious affiliation on wage rates was estimated for each sub-sample based on individuals who were employed at the time of the survey and thus had a wage rate greater than zero.

As discussed in the previous section, the inverse Mills ratio was calculated to correct for selectivity bias. First, a probit regression was estimated using the full sample of employed as well as non-employed individuals, controlling for factors that influence the decision to work. The probit equation included all of the determinants of wages plus variables for the number of children in the household, the presence of a child under age five, marital status and family income other than the individual's. The probit regression estimates are presented in Appendix A. [18] Then the inverse Mills ratio (IMR) that measures the probability of employment based on the full sample was calculated and included as a control variable in the wage equation. The IMR is shown in the tables as Lambda.

Presented next are OLS regression estimates for native born non-Hispanic white women, 27–44 years old, to assess if previous research findings are maintained with this different and more recent data set. Then the sample is extended to include a wider age range of individuals of

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[18] The "QLIM" procedure in SAS version 9.2 was used to estimate the probit equation and to calculate the IMR.

both genders up to 64 years old. In the following sections, the relationship between religious affiliation and wage rates for all sub-sample groups is discussed.

6.1. Reflection on and Comparison with Existing Research Findings: Non-Hispanic White Women (WW), 27–44 Years Old

Because of data limitations, Lehrer (2010) examined the relationship between wage rates and religion only in the case of native born non-Hispanic white females ages 27 to 44, using the 1995 National Survey of Family Growth (NSFG). The author found that, *ceteris paribus*, CPs, Mormons, and the no religion group have relatively low wages; Jews have relatively high wages; and MPs and Catholics are at the center of the wage distribution.

The PSID data used in this analysis permit examination of the religious affiliation—wages relationship for a wider range of ages and genders than was possible with the 1995 NSFG data. For comparison with existing research, the initial regressions presented use a sample similar to that previously used by Lehrer (2010). The following subsections present a comparison of descriptive statistics and OLS regression estimates for native born non-Hispanic white women (WW), 27 to 44 years old, between the PSID data used in this dissertation and previous research. The descriptive statistics will be compared to Lehrer (2010; 1999) and the OLS regression estimates will be compared to Lehrer (2010).

6.1.1. Descriptive Statistics

The *religious affiliation* means of the main variables used in the regression analyses are presented in Table V and are compared with the means from previous research, namely Lehrer (2010). The summary statistics in this table reveal a few differences between the two samples in terms of the representation of each religious group in the samples and, by extension, in the general population at the time of each study. The no religion group is considerably larger in the

recent PSID data than it was in the older NSFG set. This result is consistent with other evidence

that the no religion group has been growing rapidly in recent decades (Putnam and Campbell,

2010). The mean of Catholics is smaller, which is also consistent with recent trends of people

leaving the Catholic faith at increasing rates. For example, 10.1% of adults who were raised as

Catholics have left their faith (Pew Research Center, 2009). The dynamics of individuals

switching to and out of Catholisism might offer additional explanation. According to the U.S.

Religious Landscape Survey (Pew Research Center, 2008), although the total number of

Catholics has not historically changed, a large number of Catholics who have moved away from

Catholicism have been replaced by new Catholics who have immigrated to the United States.

The sample used in this dissertation does not include immigrants, nor does it include Hispanics.

TABLE V

DEFINITIONS AND MEANS OF ADULT RELIGIOUS AFFILIATION[a],
WW, AGE 27–44, COMPARISON WITH PREVIOUS FINDINGS

	Definition	WW 27-44, PSID data	WW 27-44, (Lehrer, 2010)
Religious Affiliation	=1 if subject's (S[b]) religious preference is the affiliation shown		
Mainline Protestant (reference category)	=1 if S is MP	0.21	0.30
Conservative Protestant	=1 if S is CP	0.29	0.23
Catholic	=1 if S is Catholic	0.27	0.35
Jewish	=1 if S is Jewish	0.02	0.02
Mormon	=1 if S is Mormon	0.01	0.03
No Religion	=1 if S has no religious affiliation	0.21	0.06
	N	840	4,181

[a] See detailed description in the variable construction section, Chapter 5, section 5.3.

[b] "Subject" refers to the individual (regardless whether he/she is a head or a spouse).

Means and relative distribution of *religious participation* are presented in Table VI and Figure 7. Religious attendance in the PSID data used in this dissertation was measured in 2003, two years prior to the survey (i.e., in adulthood). Means for religious participation can be found in Lehrer (2009, p. 190) and Lehrer (2010). However, in these studies religious participation was measured in childhood, at age 14 based on the 1995 NSFG data. Additionally, in the 1995 NSFG study, only two religious attendance categories were defined: high and low religious attendance. Individuals who attend religious services one to three times per month or more often were classified in the high religious attendance category; whereas the PSID data allow for a more nuanced classification allowing for nonlinearity.

Keeping these differences in mind, religious attendance can be compared only directionally between the two data sets—the PSID data, 2005 survey year, used in this dissertation and the results reported in Lehrer (2009) and Lehrer (2010). Lehrer (2009, p. 190) reported that 78% of CPs, 74% of Catholics and 68% of MPs fall under the high religious participation category. As seen from Figure 7, the percentage of CPs who attend religious services at least weekly is higher than that of their MP or Catholic counterparts, which is consistent with previous findings.

In the case of Catholics, however, based on the more recent PSID data set compared to the 1995 NSFG data set, it seems that a higher percentage do not attend religious services at all and a lower percentage fall under the weekly or more often category. There are two reasons why religious attendance for Catholics may be lower in recent years: (1) the data set is more recent and (2) religious attendance was reported at a different stage of life. The PSID survey reports religious participation in adulthood while the NSFG survey reports religious participation at age 14. Catholics' attendance at religious services declines as they age (Pew Research Center,

2009). While 86% of Catholics attend church at least weekly during childhood, this number

decreases to 69% during adolescence and to 42% during adulthood (see Figure 8). Protestants

also decrease the frequency at which they attend religious services as they age (Pew Research

Center 2009, Chapter IV). However, Pew Research reports on Protestants as a broad category

while this dissertation has grouped MPs and CPs separately.

TABLE VI

DEFINITIONS AND MEANS OF ADULT RELIGIOUS PARTICIPATION[a],
WW, AGE 27–44, COMPARISON WITH PREVIOUS FINDINGS

Religious Attendance (for largest groups only)[b]	Definition	WW 27–44, PSID data	WW 27–44, (Lehrer, 2010)
High	1–3 times per month or more often	0.65	0.75
Low	Less often or never attends religious services	0.35	0.25
Mainline Protestant / high		0.16	0.23
Mainline Protestant / low		0.05	0.07
Conservative Protestant / high		0.22	0.18
Conservative Protestant / low		0.07	0.05
Catholic / high		0.19	0.30
Catholic / low		0.08	0.05
N=		840	4,181

[a] See definitions in the variable construction section.

[b] Religious participation was examined for largest religious groups only. The means of these variables, plus the means for Jews, Mormons, and the no religion group, add to 1.

Figure 7. Relative distribution of religious participation[a] by religious group, WW, age 27–44

Religious Participation	Catholic	conservative Protestant	mainline Protestant
■ Very High	0.5%	11.3%	5.9%
◇ High	15.0%	21.3%	19.5%
▧ Moderate to Low	54.1%	42.3%	50.9%
≡ None	30.5%	25.1%	23.7%
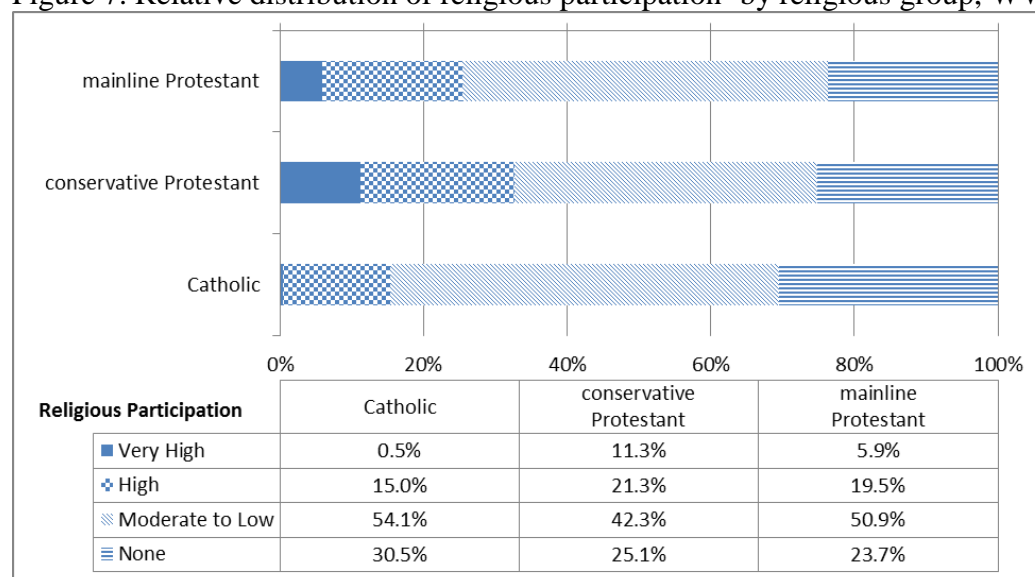
[a] Religious participation categories for each religious group add to 100 percent.

Source: PSID data, survey year 2003.

Figure 8. Religious attendance of individuals raised Catholics during childhood, adolescence, and adulthood

Religious Attendance Among Those Raised Catholic

% who attend worship services at least weekly

86%
79
74
69%
63%
60
44
42
2

As child   As teen   As adult

——◇—— Now unaffiliated   ——□—— Now Protestant   ——△—— Still Catholic
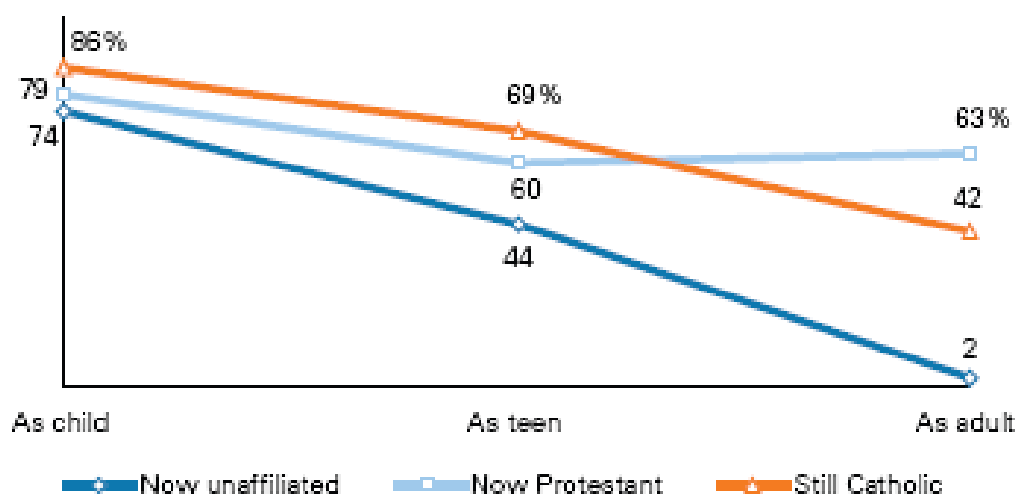
Source: Pew Research Center (2009, Chapter III)

The means of *education* or years of schooling by religious group are presented in Table VII. These means can best be compared with the means presented in Lehrer (1999, p. 360). As evident from this table, the PSID data used in this dissertation show that CPs and Catholics have a higher level of schooling compared to their respective groups in Lehrer (1999), not controlling for anything else. If educational attainment for these religious groups had been trending up over the years, this would account for this difference. A crude way to check this, not controlling for anything else, is to select a sub-sample of individuals from 45 to 62 years old, from the PSID data, survey year 2005; that is individuals who were 27 to 44 years old in 1987, reported in the 1987–88 National Survey of Families and Households (NSFH) used by Lehrer (1999, p. 360). Indeed, the difference in educational attainment for CPs and Catholics almost disappears (see Table VIII). This is consistent with findings that the educational level of Catholics has been increasing over the years (Keister, 2007) and that this group has been upwardly mobile in recent years (Keister, 2011, p. 138) due to demographic changes such as decreasing fertility rates and changes in attitudes toward work.

TABLE VII

MEANS OF EDUCATION BY RELIGIOUS AFFILIATION, WW, AGE 27–44,
COMPARISON WITH PREVIOUS FINDINGS

Religious Affiliation	Education (Years of Schooling)		
	from PSID, survey year 2005	from Lehrer (1999, p. 360)	*Difference*
Mainline Protestant	14.09	13.97	0.12
Conservative Protestant	13.48	12.89	0.69
Catholic	14.22	13.72	0.50
Jews	15.73	15.78	-0.05
No religion	13.48	--	

TABLE VIII

MEANS OF EDUCATION BY RELIGIOUS AFFILIATION, WW, AGE 45–62,
COMPARISON WITH PREVIOUS FINDINGS [a]

Religious Affiliation	Education (Years of Schooling)		
	PSID, survey year 2005	Lehrer (1999, p. 360)	*Difference*
Mainline Protestant	14.00	13.97	0.03
Conservative Protestant	12.75	12.89	-0.14
Catholic	13.80	13.72	0.08
Jews	15.61	15.78	-0.17
No religion	13.86	--	

[a] The aim of this comparison is to compare similar individuals from both data sets; i.e., individuals 45–62 years old in 2005 were 27–44 years old in 1987.

6.1.2. **Multivariate Regression Results**

Regression estimates for native-born WW 27 to 44 years old are shown in Table IX. The dependent variable is the natural logarithm of wage rate. Zero order effects and effects of religious affiliation on *ln*(wages) were estimated, controlling for other factors that influence wages. Regression estimates are presented below and compared with previous research findings. In this section, the term *previously reported* refers to findings reported in Lehrer (2010). A quick look at the overall regression estimates reveals results that are similar to previous research findings in terms of magnitude as well as signs of the estimates.

First, focusing on the zero order results, Jews are estimated to have higher wages than MPs by 62% (the equivalent of the coefficient of 0.48) compared to 59% previously reported. [19] CPs have lower wages than MPs by 13% (the equivalent of the coefficient of negative 0.12), compared to 20% previously reported. A statistically significant wage advantage of 15% (the

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[19] As Halvorsen and Palmquist (1980) show, the percentage effect associated with c, the coefficient on a dummy variable, is 100 (exp(c)-1) in a semi logarithmic regression.

equivalent of the coefficient of 0.14) was estimated for Catholics, while this result was not statistically significant in Lehrer (2010). A Mormon disadvantage of 23% was estimated at the zero order regression level (the equivalent of a 0.21 coefficient estimate), which is equal to the previously reported Mormon disadvantage of 23%. The sample for Mormons in the present sample is small, however, and this estimate does not attain statistical significance at conventional levels.

While the signs of the estimates are generally the same as previously reported, some magnitude differences are observed for most religious affiliations, but these differences are more notable for CPs and Catholics. The wage disadvantage for women associated with the CP faith is smaller and Catholic women have statistically significant wage advantage compared to statistically insignificant estimate that was reported previously. These differences may be due in part to the increase over time in the educational attainment for the CP and non-Hispanic Catholic groups (Keister, 2011).

A full regression, controlling for other determinants of wages, was also estimated. Results are presented in Table IX. The effects in the full regression are similar in size to previous research findings but with small differences in magnitude. The statistical significance is lower, however, perhaps due to smaller sample size. Although the coefficient for CPs is not statistically significant, the sign and the magnitude are similar to previous research findings. CPs have a wage disadvantage estimated at 7% by Lehrer (2010); the point estimate implies an 8% wage disadvantage in the PSID data. In addition to the small sample size, another reason why the significance for CPs diminishes when controlling for education and work experience is that the education gap between CPs and MPs has narrowed in recent years. Keister (2011) provided similar findings and a discussion about the upward mobility of CPs (Keister, 2011, p. 137). The

rate of return to investment in schooling was estimated to be 12% using the PSID data (Table IX). This result is consistent with previous findings—Lehrer (2010) estimated a 10% rate of return.

The coefficient of Lambda is positive and statistically significant, which suggests a positive correlation between the error terms of the selection and the primary equations; this indicates that the unobserved factors that make labor force participation more likely have a positive effect on wage rates.

TABLE IX

ASSOCIATION BETWEEN RELIGIOUS AFFILIATION AND WAGE RATES, OLS
REGRESSION RESULTS, WW, AGE 27–44, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	Zero order effects	Controlling for other determinants of wages
Religion Variables		
Mainline Protestant (Reference Category)		
Conservative Protestant	-0.12**	-0.08
	(0.06)	(0.05)
Catholic	0.14**	0.07
	(0.06)	(0.05)
Jews	0.48***	0.22#
	(0.16)	(0.15)
Mormon	-0.21	-0.21
	(0.20)	(0.19)
No religion	-0.15**	-0.10#
	(0.06)	(0.06)
Control Variables		
Years of Schooling		0.12***
		(0.01)
Years of work experience		0.01***
		(0.00)
Region of Residence		
Northeast		0.18***
		(0.06)
North Central		0.07
		(0.05)
West		0.05
		(0.05)
Rural area		-0.31***
		(0.09)
Constant		0.69***
		(0.19)
Lambda		0.45***
		(0.10)
Adjusted R^2	0.04	0.20
N	840	840

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

6.2. <u>Differences in the Association between Religious Affiliation and Wage Rates for Non-Hispanic White Men and Women, 27–64 Years Old</u>

The PSID data contains information about individuals of all ages, and permits examination of the associations between religious affiliation and wage rates for individuals of a wider age range than was possible in prior research. In this section, the sample is expanded to include individuals up to age 64 of both genders, and differences in the effect of religion on wage rates between white men and women are examined. Descriptive statistics are presented in the next section for non-Hispanic white women (WW) and men (WM), age 27 to 64, followed by findings based on OLS regressions.

    6.2.1. <u>Descriptive Statistics</u>

The *religious affiliation* means for sub-samples of WW and WM 27–64 years old are presented in Table X. Men and women show a similar mix of religious affiliations in this sample, with MPs, CPs and Catholics accounting for a large percentage of the overall sample for each gender. In the WW sub-sample, 24%, 28% and 27% of the cases, respectively, correspond to MPs, CPs and Catholics. The next largest group for WW is the no religion group, which includes 17% of cases. The percentages for Jews and Mormons are very low: 3% and 1%, respectively. The WM sub-sample is of almost identical mix.

Looking back to the means of the sub-sample including only individuals 27 to 44 years old (Table V), the mean for the no religion group is smaller in the 27 to 64 year old sub-sample; i.e., as we include older individuals, the percent of the no religion group becomes smaller for both WW and WM. As noted earlier, this result is consistent with other evidence that the no religion group has been growing substantially in recent decades (Putnam and Campbell, 2010).

TABLE X

DEFINITIONS AND MEANS OF ADULT RELIGIOUS AFFILIATION[a], WW AND WM,
AGE 27–64, PSID 2005 SURVEY YEAR

	Definition	WW 27–64, PSID data	WM 27–64, PSID data
Religious Affiliation	=1 if Subject's (S[b]) religious preference is the affiliation shown		
Mainline Protestant (reference category)	=1 if S is MP	0.24	0.23
Conservative Protestant	=1 if S is CP	0.28	0.27
Catholic	=1 if S is Catholic	0.27	0.27
Jewish	=1 if S is Jewish	0.03	0.03
Mormon	=1 if S is Mormon	0.01	0.02
No Religion	=1 if S has no religious preference	0.17	0.18
	N	1,567	1,942

[a] See detailed description in Section 5.3, the variable construction section.

[b] Subject refers to the individual (regardless whether he/she is a head or a spouse).

Means of *education* measured by years of schooling for WW and WM 27 to 64 years old are shown in Table XI. Consistent with previous research, Jews are at the highest end, CPs and the unaffiliated are at the lowest, and MPs and Catholics are at the middle of the educational attainment distribution for both gender groups. CP women have higher educational level by a small margin and Mormon women have lower educational level by a large margin than their male counterparts. For other religious groups, the differences in education between women and men are not statistically significant.

TABLE XI

MEANS OF EDUCATION BY RELIGIOUS AFFILIATION, WW AND WM,
AGE 27–64, PSID 2005 SURVEY YEAR [a]

Education (Years of Schooling)

Religious Affiliation	WW, age 27–64	WM, age 27–64	Difference [a, b] (WW-WM)
Mainline Protestant	14.2	14.1	0.1
Conservative Protestant	13.5	13.2	0.3**
Catholic	14.1	14.2	-0.1
Jews	15.6	15.9	-0.3
Mormon	13.6	14.7	-1.1**
No religion	13.8	13.5	0.3

[a] Significance *t*-tests of the difference in education between men and women were performed.

[b] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

6.2.2. Multivariate Regression Results

OLS regression results for WW and WM are presented in Tables XII and XIII, respectively. All regressions are based on the sub-sample of individuals who were employed at the time of the survey. The dependent variable for all regressions is *ln*(wage). The regressions also include the IMR to control for selectivity; it is shown as Lambda in the results tables. [20]

First, focusing on the non-Hispanic white women (WW) regression estimates, the zero order regression shows that MPs are at the center of the wage distribution. Catholics and Jews have positive coefficients of 0.09 and 0.31, equivalent to an advantage of 9% and 36%

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[20] Male regressions in the literature typically do not include the IMR. However, identically estimated IMR was included in the male regressions to be able to compare the results for men and women.

respectively, while CPs and the no religion groups have coefficients of negative 0.14 and

negative 0.11, which are equivalent to 13% and 10% lower wages than MPs, respectively. [21] [22] [23]

Column 2 of Table XII presents the estimates from the second model for WW, which

includes controls for other determinants of wages. The estimates from this regression model

show the influence of religious affiliation on wage rates that remains after controlling for years

of schooling, experience and place of residence. The negative effects of the CP and the no

religion groups remain significant and the magnitude decreased to 8% for both religious groups

for WW. The magnitude of the Catholic effect decreased to 6%. The Jewish estimate decreased

to 0.15, which is equivalent to a 16% wage premium, compared to MPs. Although a large

percentage of the Jewish wage premium is due to higher education and labor market experience,

there is a substantial part due to other factors not measured in the data. As suggested by previous

studies, other factors that may influence wages of Jews include a higher level of social capital in

the labor market and a higher quality of schooling (Lehrer, 2010). A wage disadvantage of 24%

(coefficient estimate of negative 0.28) was estimated for WW associated with the Mormon

religion.[24]

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[21] The coefficients of the religion variables are interpreted according to the methodology described in Halvorsen and Palmquist (1980); i.e., the percentage effect associated with c, the coefficient on a dummy variable, is 100 (exp(c)-1) in a semi logarithmic regression.

[22] Note that the coefficient for CPs 27 to 44 years old presented in section 6.1.2 was not significant. The negative coefficient becomes significant when including the population from the previous generation, reflecting the upward trend of the educational attainment of this religious group.

[23] The no religion group includes atheists, agnostics and unaffiliated. Previous studies have found that a high percentage of academics, who obviously have high education, report that they are not religiously affiliated (Stark et al., 1996; Iannaccone, 1998; Stark and Finke, 2000). Therefore, the effects of the no religion need to be interpreted with caution. Separating this group into two categories—with high and low educational attainment—was attempted; however, the highly educated category was a small sample and the estimates were not statistically significant.

[24] The sample size for Mormons is small, with only 38 observations. However, the estimate is statistically significant and consistent with previous findings.

The coefficient on schooling, which can be interpreted as the rate of return to schooling, was 12% for WW, which is consistent with previous findings. For example, Lehrer (2010) estimated a 10% effect of schooling in the regression model specification including adult religious affiliation. The effect of additional year of full time work experience is a 1% wage premium. Returns to schooling are discussed in greater detail in Chapter 8.

The coefficient of Lambda is positive and statistically significant, which suggests a positive correlation between the error terms of the selection and the primary equations. This indicates a positive effect on wage rates for WW of the unobserved factors that make labor force participation more likely.

Next, focusing on the regression estimates for non-Hispanic white men (WM), shown in Table XIII, the zero order regression shows similar results to their female counterparts for most religious affiliations. Mormons are a striking exception. MPs are at the middle of the wage distribution. Catholics, Jews, and Mormons have wages that are higher than MPs by 8%, 73%, and 39% (coefficient estimates of 0.08, 0.55 and 0.33), respectively, while the CP and no religion groups have wages that are lower by 15% and 23% (coefficient estimates of negative 0.14 and 0.21), respectively.

After controlling for education, labor market experience and geographical residence, the wage premium for Catholics, Jews and Mormons decreased to 6%, 45% and 27% (coefficient estimates of 0.06, 0.37 and 0.24), respectively. Moreover, the statistical significance of the Catholic and Mormon effects decreased. The wage disadvantage of CPs and the no religion group decreased to 9% and 19% (coefficient estimates of negative 0.09 and 0.17), respectively (results are shown in column 2 of Table XIII).

The effect of an additional year of schooling for WM is 8% and the effect of an additional year of full time work experience is 1%. The coefficient of Lambda for WM is negative and statistically significant, which indicates a negative correlation between the error terms of the selection and the primary equations. This means that the unobserved factors that make labor force participation more likely have a negative influence on wage rates for WM.

While there are some similarities between WW and WM, there are also some differences. The signs of the effect of all religious affiliations on wages were the same for WW and WM except in the case of Mormons. The magnitudes of the effects vary, however, and are generally larger for WM. Both men and women affiliated with the *CP* faith have a statistically significant and almost identical wage disadvantage: 8% for women and 9% for men, *ceteris paribus*. Women and men affiliated with the *Catholic* faith have an identical wage premium of 6%, although the effect for Catholic women is based on a coefficient that does not attain statistical significance. Other studies based on recent time periods have also found that Catholics have relatively higher earnings (Keister, 2011, p. 73) which may be due in part to their approach toward work, an activity that produces results as opposed to pleasure (Tropman, 1995; 2002) and to high quality of Catholic schools (Keister, 2011, p. 139). Jewish men and women have a sizeable and significant wage premium; however, the premium is of considerably larger magnitude for men than it is for women. Jewish men have a 45% higher wage outcome while Jewish women have only a 16% wage premium. The no religion group has a wage disadvantage of 8% for women and 23% for men.

The biggest difference between white women and men is in the case of Mormons. While women affiliated with the Mormon faith have lower wages than their MP counterparts, men affiliated with the Mormon faith have higher wages than their MP counterparts. This difference

is due in part to difference by gender in schooling. As Table XI shows, the mean of years of schooling for men is 14.7, compared to 13.6 for women. In the regressions that hold other factors constant, we see that while Mormon women have wage disadvantage of 24%, Mormon men have a wage premium of 27%. This difference is due in part to the low levels of work experience among Mormon women, given that they tend to work part time (Heaton, 1994). In addition, it is likely that Mormon women devote more effort to household work (Ellison and Bartkowski, 2002), similar to their CP counterparts; this hypothesis deserves attention in future research. The wage disparity between Mormon women and men may also reflect the direct efect of the Mormon church doctrine, which encourages and helps Mormon men (not women) to accumulate wealth and earn higher wages (Winter, 2012).

The effect of education on wage rates was higher for women: a 12% rate of return to schooling for WW and an 8% rate of return to schooling for WM. [25] Generally, rates of return to education for men are lower (Dougherty, 2005; Pekkarinen, 2012). An additional year of full time work experience has a 1% effect on wage rates for both WW and WM.

Region was used as a control for geographical location variance. North East, North Central, and West regions were included in the regressions and the South region was omitted and used as a benchmark. The region effect for women who reside in the Northeast is positive, while this effect for men is negative, contrary to expectations, although not statistically significant. A further look in the regressions that examine the association between returns to education and wages, and religious participation and wages for CPs, MPs and Catholics considering separate samples for each religious group, shows that the Northeast coefficient is negative only for CP

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[25] The rates of return to schooling are expected to differ by religious group. These analyses are presented later in Chapter 8.

men (see Tables XVIII and XXVII) and positive for their MP and Catholic counterparts. This finding merits further examination. A rural dummy variable to control for large city effects was also included as a control for location variance. As expected, the results show a significant and negative effect of rural residence for both men and women.

The IMR was also included in the regression models and had a positive coefficient for women and a negative coefficient for men. The unobserved factors that make labor force participation more likely for women are associated with higher wages. The IMR coefficient for men is negative, however, which means that the unobserved factors that make labor force participation more likely are associated with lower wages for men. These results suggest that the circumstances surrounding the labor force participation decision for men and women are different. This difference, if confirmed in future studies, merits further research.

TABLE XII

ASSOCIATION BETWEEN RELIGIOUS AFFILIATION AND WAGE RATES, OLS
REGRESSION RESULTS, WW, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	Zero order effects	Controlling for other determinants of wages
Religion Variables		
Mainline Protestant (Reference Category)		
Conservative Protestant	-0.14***	-0.08*
	(0.04)	(0.04)
Catholic	0.09**	0.06
	(0.04)	(0.04)
Jews	0.31***	0.15*
	(0.09)	(0.08)
Mormon	-0.02	-0.28*
	(0.15)	(0.14)
No religion	-0.11**	-0.08*
	(0.04)	(0.04)
Control Variables		
Years of Schooling		0.12***
		(0.01)
Years of work experience		0.01***
		(0.00)
Region of Residence		
Northeast		0.15***
		(0.04)
North Central		0.03
		(0.03)
West		0.10**
		(0.04)
Rural area		-0.35***
		(0.07)
Constant		0.82***
		(0.17)
Lambda		0.35***
		(0.12)
Adjusted R^2	0.06	0.19
N	1,567	1,567

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XIII

ASSOCIATION BETWEEN RELIGIOUS AFFILIATION AND WAGE RATES, OLS
REGRESSION RESULTS, WM, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	Zero order effects	Controlling for other determinants of wages
Religion Variables		
Mainline Protestant (Reference Category)		
Conservative Protestant	-0.14***	-0.09**
	(0.03)	(0.03)
Catholic	0.08**	0.06*
	(0.03)	(0.03)
Jews	0.55***	0.37***
	(0.09)	(0.08)
Mormon	0.33***	0.24**
	(0.11)	(0.10)
No religion	-0.21***	-0.17***
	(0.04)	(0.04)
Control Variables		
Years of Schooling		0.08***
		(0.01)
Years of work experience		0.01***
		(0.00)
Region of Residence		
Northeast		-0.04
		(0.04)
North Central		-0.09**
		(0.03)
West		0.05
		(0.03)
Rural area		-0.21**
		(0.06)
Constant		2.22***
		(0.12)
Lambda		-1.29***
		(0.18)
Adjusted R^2	0.08	0.20
N	1,942	1,942

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

7. WAGE DIFFERENTIALS ALONG THE WAGE RATE DISTRIBUTION: QUANTILE REGRESSION APPROACH

Previous research and the previous chapter have established that mean wage rates do indeed vary among religious groups. Do the religion effects differ between low wage, high wage and average wage earners? The Quantile regression (QR) methodology enables us to examine these differences along the wage rate distribution. While the OLS methodology estimates the conditional mean of the response variable given certain values of the independent variables, the QR estimates the conditional median or other quantiles (decile, quartile, pentile, etc., as specified by the researcher) along the distribution of the wage rate. Therefore, the QR provides an overview of the entire distribution and will add value in understanding the relationship between religion (and other independent variables) and wage rates across the distribution of wages.

Recently, studies in labor economics have increasingly used the QR approach to study wage rate inequality in various contexts. This literature is reviewed in the next section; followed by a discussion of the advantages of the QR approach; data analysis that supports the appropriateness of the QR methodology; the QR model specification and estimation; and finally the empirical findings are presented.

7.1. Literature Review of the Quantile Regression Methodology used to Study Wage Rate Differentials

The QR approach has been used in a number of contexts in labor economics to examine various effects on earnings along the earnings distribution. For example, the QR approach has been used to examine the *returns to education* (Buchinsky, 1998; Eide et al., 2002; Martins and Pereira, 2004; Machado and Mata, 2005; Chiswick et al., 2006), the *gender wage gap* (Garcia et al., 2001; Sakellariou, 2004; Miller, 2009), the *public and private sector* wage differentials

(Mueller, 1998; Poterba and Rueben, 1994; Nielsen and Rosholm, 2001) as well as wage differentials between *native born and immigrants* (Chiswick et al., 2006) across the earnings distribution.

Studies that have examined *returns to education* have found that the payoff to education increases as wage rates increase (Buchinsky, 1998; Eide et al., 2002; Martins and Pereira, 2004; Machado and Mata, 2005; Chiswick et al., 2006). These studies have used data from the United States as well as other countries. Buchinsky (1998) used the Current Population Survey (a U.S. data set) and examined the returns to education over time across different quantiles for various age groups. The author estimated a wage equation including education, squared term of education, interaction terms between education and experience, and between education and a race dummy. He concluded that the returns to education vary across the different quantiles; namely, that earnings generally increased as the educational level increased at all quantiles except at the lower end of the wage distribution where there was very little increase.

Martins and Pereira (2004) examined the returns to education for other countries and also found that returns to education vary along the earnings distribution. The authors used a QR methodology to estimate returns to education of full time employed men from 16 developed, Western countries during the mid-1990s. They found that returns to schooling were higher for individuals at the top of the earnings distribution. The authors presented three factors that might be driving these results. First, because of the interaction between schooling and ability, the most able earners may benefit the most from their education. Second, the authors noted, there may be over-educated workers or situations where highly educated workers take jobs with a low-skill requirement that results in low pay. Third, differences in school quality or fields of study may also contribute to differences in returns to education.

Machado and Mata (2005) applied the QR methodology to Portuguese data for the period of 1986 to 1995 to examine the effect of education on wage inequality and found that wages increased with an increase of education across the earnings distribution. This effect was more important at the high quantiles than at the low quantiles of the wage distribution.

The QR approach has also been used in the *gender wage gap* literature to examine wage discrimination and wage rate differentials between men and women. U.S. studies have consistently found pronounced differences in wages between men and women along the wage rate distribution (Arulampalam et al., 2007; Miller, 2009) in both *public and private sectors* (Poterba and Rueben, 1994; Miller, 2009). Using data from the 2000 U.S. Census, Miller (2009) estimated wage differentials between men and women in public and private sectors and found that women earn less across the wage distribution, although the gender pay gap differs depending which part of the wage distribution and which sector are considered. Poterba and Rueben (1994) used the Current Population Survey (CPS) data from 1979 to 1980 and 1990 to 1991 and employed the QR methodology to estimate the average public sector wage premium. The authors found that the level of the estimated public sector wage premium is different along the wage distribution. More specifically, the authors concluded that there is a much smaller penalty associated with working in the public sector at the lower end than at the higher end of the wage distribution.

Studies that have examined gender pay gap along the wage distribution in other countries have reported mixed results (Garcia et al., 2001; Sakellariou, 2004). While Garcia et al. (2001) found that the wage gap between men and women increased with the pay scale using data from Spain, Sakellariou (2004) found that the wage underpayment of women at low wage rates was much higher and gradually decreased as the income increased using data from Singapore. That

is not to undermine the estimates for the U.S., as pay structure and policies between countries are different and the results for U.S. cannot be expected to hold for other countries.

The QR methodology has also been used to study the wage rate differentials between *native born and immigrants* (Butcher and DiNardo, 2002; Chiswick et al., 2006). Butcher and DiNardo (2002) found that the earnings differentials between native born and immigrants were not uniform across the earnings distribution for women. The minimum wage could be associated with a compression of the wage differentials among the lowest paid groups, such as recently arrived female immigrants (Butcher and DiNardo, 2002).

Chiswick et al. (2006) applied the QR methodology to study the wage rate differences between native born and immigrants in the U.S. and Australia. For the U.S., the authors used the 2000 U.S. Census of Population, Public Use Microdata Sample (1% sample), and examined the wage differentials between native born and immigrants from non-English-speaking and from English-speaking countries. They found that the earnings disadvantage of immigrants from non–English-speaking countries is lower at the lower deciles. For Australia, the authors used the 2001 Australian Census of Population and Housing. They performed similar analyses and found that in Australia immigrants in the bottom decile do well compared to immigrants in the U.S., while high wage immigrants from English speaking countries do not do as well in Australia as in U.S. The authors explained these findings as a result of the minimum wage laws in the U.S. that compress earnings at low deciles. In Australia, however, because of the greater degree of institutional wage setting in the labor market, immigrants from English-speaking countries have relatively flat earnings profiles.

7.2. <u>Model Specification and Estimation</u>

Following Koenker and Bassett (1978), and other studies such as Buchinsky (1998), let

us assume that y_i is the wage rate of each individual i, where i=1,2,…,n. Let $x_i{}^{26}$ denote a k by 1

vector of characteristics of an individual i. With the standard linear expectation model, wage

rate is expected to be a linear function of all independent variables x_i and takes the following

form:

$$E(y_i \mid x_i) = \alpha + \beta x_i \tag{3}$$

Conditional on x_i, the coefficient β describes how religion and other independent

variables affect wage rates. A simple Quantile regression model can be written as:

$$Quant_\theta \, (y_i \mid x_i) = \alpha_\theta + x_i \beta_\theta \tag{4}$$

where $Quant_\theta$ refers to the conditional quantile of $y_{i,}$ conditional on the vector of explanatory

variables x_i, and $\theta \in (0,1)$. It is assumed that $Quant_\theta \, (u_{\theta i} \mid x_i)=0$. For the linear quantile model, it

is the θth quantile of y_i that depends on religion.

The QR estimates for β are achieved by minimizing the weighted sum of the absolute

value of the errors. The θth conditional QR estimates for β are obtained by solving the following

minimization problem:

$$\min_{\beta} \left[\sum_{\{i:yi=>xi\beta\}} \theta|yi - xi\beta| + \sum_{\{i:yi=>xi\beta\}} (1 - \theta)|yi - xi\beta| \right] \tag{5}$$

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[26] Note that x_i includes religion. In the empirical methodology and model specification section in Chapter 4, section 4.2, religion is listed separately.

The QLIM procedure in SAS, version 9.2, was used to solve this problem and the standard errors were obtained by the bootstrap method.[27] The model is estimated at each decile by setting $\theta = 0.1$ for the first decile, $\theta = 0.2$ for the second decile, $\theta = 0.3$ for the third decile, $\theta = 0.4$ for the fourth decile and $\theta = 0.5$ for the median regression. As θ is increased from 0 to 1, the whole distribution of y, conditional on x, is examined.

7.3. <u>Advantages of the Quantile Regression Methodology</u>

The Quantile regression (QR) methodology has a number of advantages. First, the QR approach enables examination of the relationship between religion and wage rates along the wage rate distribution while the OLS regression only estimates the dependent variable at the mean. Because the QR methodology can estimate wage rates along the wage rate distribution, it permits comparison of the effects of religion along the wage rate distribution as opposed to just the mean. Second, the estimated coefficients of the explanatory variables are not sensitive to outlier observations in the sample because the QR methodology is based on a weighted sum of absolute deviations and it gives a robust measure of location on the distribution spectrum. Third, when the error term in the regression is of a non-normal distribution, the estimates obtained from QR analyses outperform the estimates at the mean, obtained using OLS (Koenker and Bassett, 1978). Finally, the QR estimates are more robust when there are differences in parameters such as variance, skewness and kurtosis (Koenker and Bassett, 1978).

In addition, the effect of other wage rate determinants can be estimated along the wage rate distribution. For example, the effect on wage rates associated with an additional year of

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[27] Option "ci=resampling" uses the bootstrap method to estimate standard errors; the "quantreg" procedure in SAS, version 9.2, was used to estimate all Quantile regressions.

schooling or year of work can be compared for low wage workers and high wage workers for each religious group.

7.4. <u>**Appropriateness of the Quantile Regression Approach: Data Analysis Support**</u>

QR is appropriate when the effects of the independent variables on the dependent variable are expected to be different at low versus high wages. This is likely the case in the relationship between religion and wage rates.

Previous studies have found that education varies by religious affiliation (Lehrer, 2009). Also, as discussed in the previous section, the returns to education have consistently been shown to vary along the earnings distribution (Buchinsky, 1998; Eide et al.*,* 2002; Martins and Pereira, 2004; Machado and Mata, 2005; Chiswick et al., 2006). Considering these findings together, it should follow that the relative distribution along the wage rate distribution may vary among religious groups. Therefore, the effect of religious affiliation on wage rates may differ across the wage rate distribution.

Indeed, a closer view of the data reveals that the relative distribution along the wage rate distribution differs by religious group for each sub-sample considered in this study (see Figures 9 and 10). For example, a larger percentage of Jewish earners are at the higher end of the wage rate distribution across both WW and WM sub-samples. As evident from these figures, Jews are more likely to be concentrated at the upper end of the wage rate distribution; CPs and the unaffiliated, on the other hand, are more likely to be concentrated at the lower end of the wage distribution.

The differences among religious groups across the wage distributions presented in Figures 9 and 10 can be quantified using OLS and quantile regressions, estimating an equation that has only dichotomous variables for religious affiliation as independent variables. The results

of zero order OLS regressions are presented later in the text. Because Jews are more likely to be concentrated at the upper end of the wage rate distribution, their relative wage rates would appear to be much higher than wage rates of MPs, the reference category. CPs, on the other hand, are more likely to be concentrated at the lower end of the wage distribution and thus their wage rates would appear to be lower.

Another way to support the appropriateness of the QR approach in studying the effect of religion on wage rates is to examine differences in parameters other than the mean such as variance, median, skewness and kurtosis among religious groups, presented in Table XIV. The median wage rate is the mid-point wage rate and can be different from the mean wage rate especially if the distribution is skewed. The skewness is a measure of the asymmetry of the distribution and the kurtosis is the peakedness of the distribution.

As evident from Table XIV, differences in these measures among religious groups are apparent. Jews stand out with the biggest difference in all of these measures relative to other religious affiliations. This difference is especially pronounced in terms of kurtosis. The mean, median and variance values of the natural logarithm of wage rates are highest for Jews and lowest for CPs. These measures display similar patterns among women and men. Because of these differences in parameters, the QR methodology may be more appropriate than OLS for examining wage differentials between religious groups.

Figure 9. Relative distribution of log hourly wages, employed, WW, age 27–64
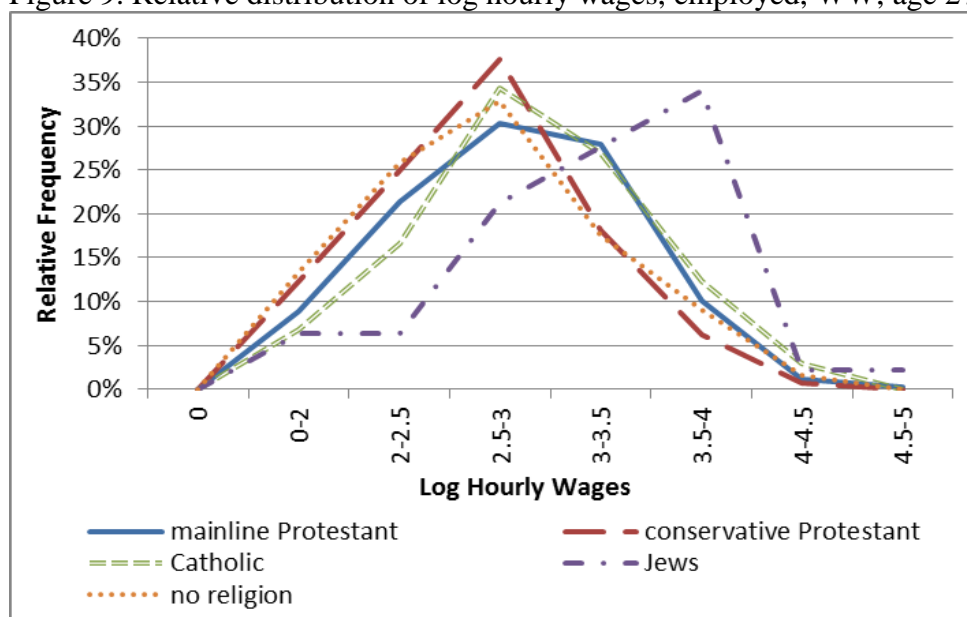
Note: Jews are a small sample, which affects the smoothness of the distribution curve.

Figure 10. Relative distribution of log hourly wages, employed, WM, age 27–64
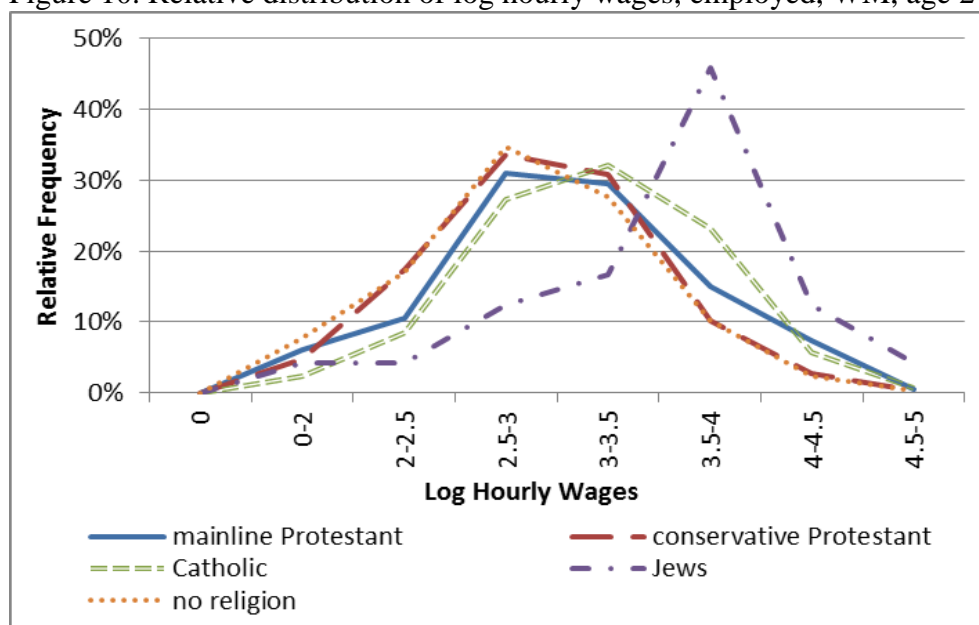
Note: Jews are a small sample, which affects the smoothness of the distribution curve.

TABLE XIV

PARAMETER STATISTICS OF LOG WAGE RATE BY RELIGIOUS AFFILIATION, AGE
27–64, WW AND WM, PSID 2005 SURVEY YEAR

	Religious Affiliation	Mean	Median	Variance	Skewness	Kurtosis
Non-Hispanic White Women (WW)	Conservative Protestant	2.65	2.78	0.33	-0.30	0.45
	Mainline Protestant	2.80	2.96	0.36	-0.28	0.07
	Catholic	2.90	3.06	0.39	-0.02	0.71
	Jewish	3.17	3.63	0.46	-1.10	2.42
	No religion	2.70	2.80	0.38	-0.10	0.11
Non-Hispanic White Men (WM)	Conservative Protestant	2.92	2.37	0.34	-0.12	1.02
	Mainline Protestant	3.08	2.58	0.44	-0.13	0.53
	Catholic	3.18	2.71	0.35	-0.11	0.41
	Jewish	3.62	3.00	0.46	-0.91	1.48
	No religion	2.89	2.50	0.41	-0.03	0.80

7.5. Empirical Findings

To examine the influence of religious affiliation on wage rates along the wage rate
distribution, the Quantile regression (QR) approach was used and the model was estimated at
each decile. The QR estimates of the effects of religious affiliation on wage rates along the wage
rate distribution for white non-Hispanic women and men are presented in the following sections.
These estimates are discussed in comparison to the OLS estimates. Finally, wage differentials
between religious groups, between men and women, and across the wage rate distribution are
presented.

7.5.1. Non-Hispanic White Women (WW)

Table XV shows wage rate estimates along the wage rate distribution for non-Hispanic
white women (WW) based on the QR methodology. The dependent variable is natural logarithm
of wage rates. The effect of religious affiliation on wages along the wage rate distribution was

examined only for CPs, MPs, Catholics and Jews due to sample size limitations for other religious groups. The Jewish effect estimates were statistically significant in spite of the small sample size; thus, this religious group was also included in the analyses. Illustrations of the simple wage differentials for CPs, Catholics and Jews compared to MPs (the reference category) are also provided in Figure 11.

Based on the standard OLS estimates for *non-Hispanic white women* (WW), presented in Table XV, Column 1, affiliation with the CP faith is associated with an 8% wage disadvantage, the equivalent of a negative coefficient of 0.08. The effect of being Catholic is not significantly different from the effect of MPs. Jewish women have a 16% wage premium, the equivalent of 0.15 coefficient estimate.

The estimates based on the QR methodology reveal that the effects of religious affiliation on wage rates vary along the wage rate distribution. Although at first glance the variation is not large, the differential could be sizable especially at high wages. Overall, the QR estimates are not statistically significant at the lowest end of the wage distribution, which suggests that religious affiliation may be a more important factor in influencing wages at high wage rates. The QR estimates reveal that the wage disadvantage of CP women is slightly larger at high wages. In the case of Catholic women, the OLS estimate and the QR estimates at low deciles are not statistically significant; however, the QR estimates at high wages show that Catholics have a statistically significant wage premium equivalent to 9% and 10% at the 8th and 9th decile respectively. Jewish women have a generally uniform wage premium across the wage rate distribution.

For low-wage groups, as in the case of CPs, the minimum wage rate may play a role in compressing the wage rate differentials among the lowest paid groups, as previously discussed in the context of immigrant studies (Butcher and DiNardo, 2002; Chiswick et al., 2006).

7.5.2. Non-Hispanic White Men (WM)

Similar regression models to those estimated for women were also estimated for men. The influence of religious affiliation on wages along the wage rate distribution was examined for CPs, MPs, Catholics and Jews. Table XVI shows wage rate estimates at each decile along the wage rate distribution. The simple wage differentials for CPs, Catholics and Jews compared to MPs (the reference category) are also illustrated in Figure 12.

The OLS regression estimates for *non-Hispanic white men* (WM) show that individuals affiliated with the CP faith have wages that are lower than wages of MPs by 9%, the equivalent of a coefficient of negative 0.09. Catholic men have a 6% wage premium, the equivalent of a coefficient equal to 0.06; and Jewish men have a wage premium of 45%, the equivalent of a coefficient equal to 0.37, compared to MPs, the reference category (see Table XVI, Column 1).

The rest of the columns in Table XVI show the QR estimates for each decile. The QR estimates show that the religious affiliation effects vary slightly along the wage distribution. CPs have a wage disadvantage that increases from 2% to 25% as wages increase (estimates of negative 0.02 to 0.22). These estimates are statistically significant only for wage rates above the median wage. The minimum wage may be suppressing differences at low wages.

The pattern appears to be different for Catholics. While Catholics have a wage premium at low wages, at high wages this religious group has a wage disadvantage. Moreover, it is especially interesting that the differences are statistically significant at the lowest two deciles as well as the highest decile, indicating that Catholic men at low wages have wage premium while

Catholic men at high wages have a wage disadvantage. The Jewish wage premium generally

increases as wages increase.

7.5.3. Gender Differences in the Association between Religious Affiliation and Wages along the Wage Rate Distribution

The Quantile regression estimates reveal some differences in the influence of religion on

wage rates along the wage rate distribution and between men and women. For example, both CP

women as well as men have a wage disadvantage across the wage rate distribution with a much

larger wage disadvantage at the highest wage rate deciles for CP men. This finding suggests that

factors that have a negative influence on wages of CPs such as the choice of occupation,

typically at the lower rungs of the occupational structure (Keister, 2011, p. 65; Sherkat, 2012)

and outside of sciences (Darnell and Sherkat, 1997), may be more important at high wages. CP

men may be in occupations that have different earning trajectories. In addition, this finding may

be a reflection of age–earnings patterns. According to the theory of labor economics, average

earnings rise with the level of education and earning profiles by age have a convex shape with

steeper increase early in one's career, so that "education-related earnings differences later in

workers' lives are greater than those early on" (Ehrenberg and Smith, 1997, p.300).

While both Jewish men and women have a wage premium across the wage rate

distribution, it appears that there are some differences at the highest end of the wage rate

distribution. For Jewish men, the wage rate premium slightly increases at high wages, while for

women the wage rate premium decreases as wages increase. This pattern of a declining wage

premium of Jewish women may be explained by their tendency to stay home when they have

small children (Chiswick, 1986; Hartman and Hartman, 1996). As a result, they may experience

career interruptions at a mid-career path that hinders their ability to continue their upward wage trajectory.

Catholic men have a wage premium at low wages that disappears as wages increase to become a wage disadvantage at the highest decile. For Catholic women the opposite is true. Women affiliated with the Catholic faith have a statistically significant wage premium at high wages. These patterns warrant future research if confirmed by future studies.

Figure 11. Wage rate differentials among religious groups along the wage rate distribution, WW, age 27−64
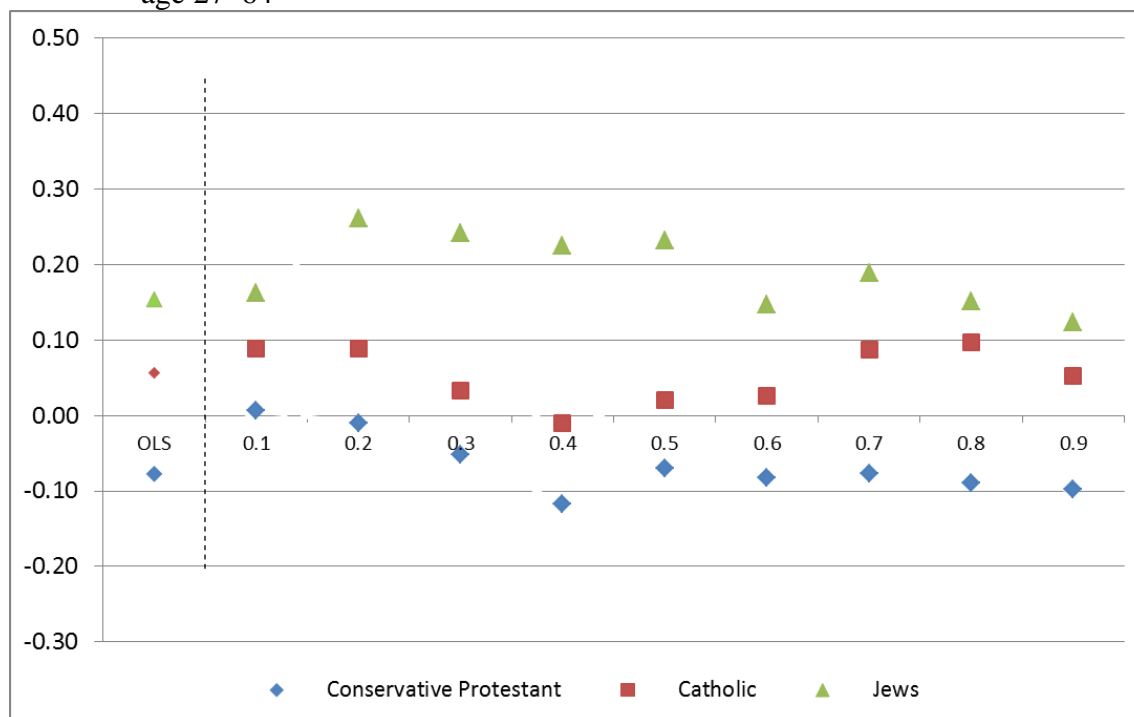
Figure 12. Wage rate differentials among religious groups along the wage rate distribution, WM, age 27−64
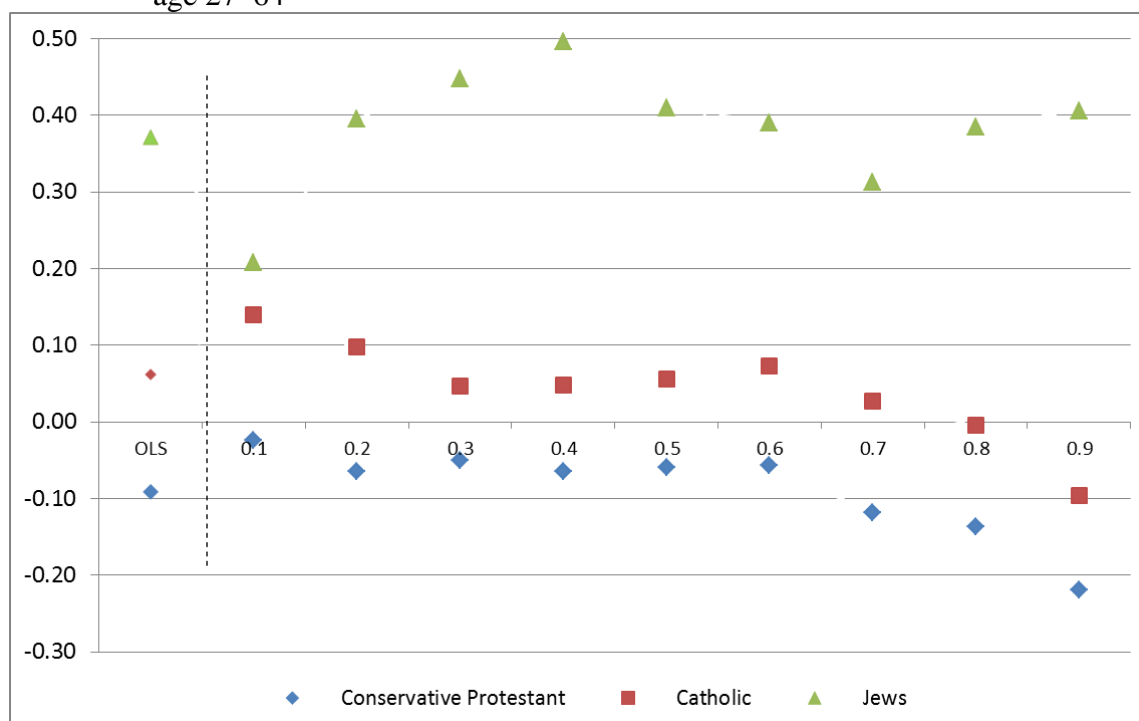
TABLE XV

ASSOCIATION BETWEEN RELIGIOUS AFFILIATION AND WAGE RATES, OLS AND QUANTILE REGRESSION
RESULTS, WW, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	*Quantile*								
		0.1	0.2	0.3	0.4		0.6	0.7	0.8	0.9
Religion Variables										
Mainline Protestant										
Conservative Protestant	-0.08*	0.01	-0.01	-0.05	-0.12***	-0.07#	-0.08**	-0.08*	-0.09**	-0.10#
	(0.04)	(0.09)	(0.06)	(0.05)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.06)
Catholic	0.06	0.09	0.09	0.03	-0.01	0.02	0.03	0.09*	0.10***	0.05
	(0.04)	(0.08)	(0.07)	(0.05)	(0.03)	(0.05)	(0.04)	(0.04)	(0.03)	(0.06)
Jews	0.15*	0.16	0.26	0.24#	0.22**	0.23***	0.15**	0.19**	0.15#	0.12
	(0.08)	(0.31)	(0.20)	(0.14)	(0.10)	(0.07)	(0.07)	(0.09)	(0.09)	(0.15)
Control Variables										
Years of Schooling	0.12***	0.13***	0.12***	0.12***	0.12***	0.12***	0.12***	0.12***	0.13***	0.13***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years of work experience	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Region of Residence										
Northeast	0.15***	0.15*	0.20***	0.20***	0.15***	0.16***	0.14***	0.16***	0.14***	0.11*
	(0.04)	(0.08)	(0.07)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
North Central	0.03	0.06	0.03	0.05	0.03	0.07#	0.03	0.02	0.02	0.03
	(0.03)	(0.08)	(0.05)	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.06)
West	0.10**	0.00	0.08	0.13***	0.11***	0.14***	0.11***	0.11**	0.13**	0.15**
	(0.04)	(0.10)	(0.07)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.06)	(0.07)

TABLE XV (continued)

ASSOCIATION BETWEEN RELIGIOUS AFFILIATION AND WAGE RATES, OLS AND QUANTILE REGRESSION RESULTS, WW, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4		0.6	0.7	0.8	0.9
Rural Area	-0.35***	-0.43**	-0.33***	-0.30***	-0.34***	-0.36***	-0.29***	-0.28***	-0.30***	-0.39***
	(0.07)	(0.20)	(0.12)	(0.12)	(0.08)	(0.09)	(0.09)	(0.09)	(0.08)	(0.12)
Constant	0.82***	-0.13	0.28	0.50**	0.74***	0.79***	0.96***	1.14***	1.13***	1.29***
	(0.17)	(0.39)	(0.24)	(0.22)	(0.20)	(0.19)	(0.17)	(0.19)	(0.18)	(0.28)
Lambda	0.35***	0.52**	0.39***	0.34*	0.35**	0.42***	0.26**	0.28*	0.32**	0.35*
	(0.12)	(0.25)	(0.13)	(0.17)	(0.14)	(0.12)	(0.13)	(0.17)	(0.13)	(0.18)
Adjusted R^2	0.19									
N	1,567									

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[e] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XVI

ASSOCIATION BETWEEN RELIGIOUS AFFILIATION AND WAGE RATES, OLS AND QUANTILE REGRESSION RESULTS, WM, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Religion Variables										
Mainline Protestant										
Conservative Protestant	-0.09**	-0.02	-0.06	-0.05	-0.06	-0.06*	-0.06	-0.12**	-0.14***	-0.22***
	(0.03)	(0.06)	(0.05)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.06)
Catholic	0.06*	0.14**	0.10**	0.05	0.05	0.06	0.07#	0.03	-0.004	-0.10*
	(0.03)	(0.06)	(0.05)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
Jews	0.37***	0.21	0.40*	0.45**	0.50***	0.41***	0.39***	0.31***	0.39***	0.41**
	(0.08)	(0.24)	(0.22)	(0.14)	(0.11)	(0.08)	(0.09)	(0.10)	(0.15)	(0.20)
Control Variables										
Years of Schooling	0.08***	0.05***	0.06***	0.07***	0.08***	0.09***	0.10***	0.10***	0.10***	0.11***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Years of work experience	0.01***	0.01**	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Region of Residence										
Northeast	-0.04	-0.04	-0.07#	-0.07	-0.03	0.00	0.03	0.02	-0.03	0.01
	(0.04)	(0.06)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.06)
North Central	-0.09**	-0.14***	-0.08#	-0.04	-0.06**	-0.05#	-0.03	-0.04	-0.07**	-0.10**
	(0.03)	(0.05)	(0.05)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.05)
West	0.05	-0.03	-0.01	0.04	0.04	0.09**	0.10***	0.10**	0.12***	0.11
	(0.03)	(0.05)	(0.06)	(0.04)	(0.04)	(0.04)	(0.03)	(0.05)	(0.04)	(0.08)

TABLE XVI (continued)

ASSOCIATION BETWEEN RELIGIOUS AFFILIATION AND WAGE RATES, OLS AND QUANTILE REGRESSION
RESULTS, WM, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Rural Area	-0.21**	-0.26**	-0.31***	-0.24**	-0.19***	-0.17***	-0.19***	-0.22***	-0.17**	-0.16***
	(0.06)	(0.12)	(0.07)	(0.12)	(0.06)	(0.06)	(0.05)	(0.07)	(0.07)	(0.11)
Constant	2.22***	2.05***	2.18***	2.18***	2.16***	2.11***	1.91***	2.16***	2.25***	2.39***
	(0.12)	(0.19)	(0.18)	(0.14)	(0.13)	(0.13)	(0.14)	(0.14)	(0.14)	(0.22)
Lambda	-1.29***	-1.68***	-1.72***	-1.54***	-1.40***	-1.26***	-0.93***	-1.04***	-0.95***	-0.75***
	(0.18)	(0.25)	(0.27)	(0.24)	(0.20)	(0.18)	(0.22)	(0.19)	(0.22)	(0.28)
Adjusted R^2	0.20									
N	1,942									

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[e] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

8.   THE ROLE OF RELIGIOUS AFFILIATION AND GENDER IN DETERMINING RETURNS TO EDUCATION

Returns to education may vary across the population, depending on characteristics of individuals such as gender, family background, ability or level of schooling (Card, 1999; 2001). Studies that have examined returns to education by gender for the general population are numerous. However, research that has examined the returns to education by religious affiliation is very limited. Religious affiliation is an individual characteristic that has been found to be an important determinant of socioeconomic outcomes such as education, labor market experiences and wages, among others.

The focus of this chapter will be to employ the human capital model to examine differences in returns to education by gender between three major religious groups in the U.S.: MPs, CPs and Catholics. Returns to education by religious affiliation and gender have previously been estimated in Lehrer (1999). This chapter estimates such returns with a more recent data set and a sample of individuals from a larger age range than were used in that study. Furthermore, the analyses in this chapter will utilize the Quantile regression (QR) methodology to explore differences in returns to education along the wage rate distribution.

The rest of the chapter is organized as follows. First, the literature that has examined returns to education is reviewed with a focus on differences in returns to education between religious groups and by gender. Next, a theoretical framework and expectations are discussed. Finally, empirical findings are presented: first based on OLS and then based on the QR methodology.

8.1.   Literature Review

8.1.1. Religious Affiliation and Returns to Education

There is only one existing study that has specifically examined returns to education by religious affiliation (Lehrer, 1999).[28] The motivation for Lehrer's (1999) analysis was to assess the relative magnitudes of supply and demand forces in influencing differences in educational attainment across groups. The author used data from the 1987–88 National Survey of Families and Households and the framework of the human capital model (Becker and Chiswick, 1966) to study differences in returns to education and educational attainment between religious groups including Jews, CPs, MPs and Catholics for non-Hispanic whites, both women and men.[29] She found that Jews have relatively higher educational attainment and higher returns to education than other religious groups, while CPs have relatively lower educational attainment but similar returns to education to those of MPs. Lehrer (1999) reported conclusions about the relative positions of the supply of funds for education and the demand for education of the religious groups. Specifically, she interpreted the higher rate of return to schooling for Jews as evidence that demand forces are dominant for this group, consistent with previous findings (Chiswick, 1988).[30] The author interpreted the fact that the rate of return for CPs is the same as that of MPs as evidence that the supply and demand forces are of similar magnitude.[31] In addition, Lehrer (1999) discussed the reasons for these relative positions of the curves for the supply of funds and the demand for education, which were reviewed in Chapter 4, section 4.1.1.1.

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[28] Note that differences in returns to education of Jewish compared to non-Jewish men have also been examined (Chiswick, 1988).

[29] CPs are labeled as "Fundamentalist Protestants" in Lehrer (1999).

[30] See Figure 2 in Chapter 4.

[31] See Figure 3 in Chapter 4.

8.1.2. Gender and Returns to Education

Studies that have examined returns to education by gender are numerous. The majority of these studies have reported higher returns to education for women than for men, although the results are mixed. Dougherty (2005) cites 27 U.S. studies,[32] of which 18 reported unambiguously higher returns to schooling for women.[33]

The size of the estimates generally appears to depend on the dataset used, the assumptions made and the estimation techniques (Dickson and Harmon, 2011) as well as the cohort analyzed (Lemieux, 2006b). Studies that have used U.S. Census data have estimated returns to education of 8% for men and 12% for women (Rosenzweig, 1976) and studies that have used the PSID data have estimated returns to education in the range of 5% to 6% for men and 7% to 8% for women (Gronau, 1988; Wellington, 1993) with larger estimates based on the more recent data sets—consistent with the increase of returns to education for younger cohorts (Lemieux, 2006b). Similar size estimates, 6% for men and 7% for women, have been found based on the National Longitudinal Survey for Young Men and Young Women, 1980 (Neumark, 1988) and slightly larger estimates, 8.4% for men and 10.1% for women, have been reported based on the National Surveys of Families and Households (NSFH) (Chandler et al., 1994).[34] More recently, Card (1999) reported rates of return to education of 10.9% for women and 10% for men using the Current Population Survey (CPS) data from March 1994–96.

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[32] These studies satisfy three conditions: (1) they report schooling coefficients for men and women; (2) a Mincer wage equation is estimated; (3) controls for occupation or industry are not included and the sample is not restricted by occupation or industry.

[33] Examining the rates of return to education in the U.S. is the focus of this thesis, but a similar pattern of returns has been found for the rest of the world. For example, Trostel et al. (2002) examined the rates of return to education for 28 European countries and reported that the rates of return to education are higher for women than for men in 24 of those countries.

[34] Note that the data used in (Chandler et al., 1994) were from 1978 and 1988, which is more recent than some other studies. The results are consistent with findings that rates of return to education have been historically increasing (Lemieux, 2006b).

Six of the studies referenced in Dougherty (2005) estimated returns to education for various educational levels (Angle and Wissman, 1981; Gregory et al., 1989; Blau and Kahn, 1997; Brown and Corcoran, 1997) and various ethnicity groups (Gwartney and Long, 1978; Carlson and Swartz, 1988) and did not always report higher returns to education for women; however, the majority of estimates for women were higher. Only one study, which had a relatively small sample, reported higher returns to schooling for men (Barron et al., 1993).

Mixed results were reported by two studies that examined returns to education based on two different data sets (Kane and Rouse, 1995) and marital status (Mincer and Polachek, 1974). Kane and Rouse (1995) reported that women from the National Longitudinal Study of 1972 (NLS72) data had higher returns to schooling than women from the National Longitudinal Survey of Youth (NLSY) data. Mincer and Polachek (1974) found that men have higher returns to education than married women do but lower returns to education than single women do. Variations by gender between religious groups are empirically examined and discussed in section 8.2.

One explanation why women have higher returns to education than men do is that schooling may have a double effect on earnings for women. First, education has a direct human capital effect by increasing skills and productivity for both men and women; second, education has an indirect effect on female earnings by reducing the adverse impact of discrimination, tastes and circumstances (Dougherty, 2005). The author further suggested that women who have higher educational attainment may be more resistant to discrimination in the labor market. In addition, women with more education may be more likely to seek employment in higher paying occupations that are traditionally dominated by men. Furthermore, highly educated women may

have a higher earning potential and be able to seek positions that pay higher wages (which would enable them to pay for household labor such as child care).

Other factors that have been explored—and have led to inconclusive results—are differences in the quality of educational attainment of men and women (Brown and Corcoran, 1997; Dougherty, 2005), occupational segregation of women into sectors where the returns to education are higher, biased estimates due to failure to account for sample selection, and biased estimates due to endogeneity of schooling and work experience (Dougherty, 2005).

There are some indications however, that women may be enjoying higher returns to education than their male counterparts even in the same occupations. For example, women have higher returns to education if they are in the fields of science, math and engineering (Brown & Corcoran, 1997; Del Rossia & Hersch, 2008). The field would benefit from further examination of factors that contribute to differences in male–female returns to education.

8.1.3. Other Factors that Influence Returns to Education

8.1.3.1. Educational Attainment

The level of education is an important determinant of the returns to education, and generally returns to education are higher at higher levels of education (Lemieux, 2006a). Although returns to education generally appear to be higher for women than for men, studies have found that the differences largely depend on the level of educational attainment. Higher returns to education for women have been found for individuals with some college or completed college education (Altonji, 1993; Grogger and Eide, 1995; Brown and Corcoran, 1997; Walker and Zhu, 2011). Mixed results have been reported for postgraduate degrees. While some studies have reported that women holding postgraduate degrees have higher returns to education compared to their male counterparts (Gregory et al., 1989; Blau and Kahn, 1997; Brown and

Corcoran, 1997), other studies have reported no difference (Grogger and Eide, 1995) or lower returns to education (Walker and Zhu, 2011; Angle and Wissman, 1981) for women holding postgraduate degrees.

8.1.3.2. <u>Individual Characteristics and Family Background</u>

Some studies have considered family background and individual characteristics and have found that age, immigrant status and ability are important determinants of returns to education, in addition to gender. For example, Jewish men with foreign-born mothers have higher returns to education (Chiswick, 1988), immigrants have lower returns to education compared to natives (Chiswick et al, 2006), and younger workers have higher returns to schooling than older workers (Dickson and Harmon, 2011). Becker et al. (2010) found that individuals with greater abilities receive higher net returns from college even when total benefits from college are the same. These findings, while not specifically explored in this study, give further support to the basic premise that a characteristic such as religion may have a significant effect on returns to education.

8.2. <u>Empirical Methodology</u>

To examine differences in the returns to education between religious groups, the Human Capital Earnings Function (HCEF) developed by Mincer (1974) was estimated separately for each religious group. The reduced form of the estimated model is as follows:

$$\text{Ln (WAGE}_i) = \beta_0 + \beta_1(\text{EDUC}_i) + \beta_2(\text{EXP}_i) + \beta_3(\text{EXP}^2_i) + \beta_4 X_i + \varepsilon_i \qquad (6)$$

where WAGE_i is the hourly wage rate of individual i; EDUC_i is the individual's years of schooling; EXP_i is the individual's years of work experience; EXP^2_i is the square of the individual's years of work experience; X_i is a vector of controls for the individual's residence; and ε_i is the error term. Correction for sample selection bias was also performed. The inverse

Mills ratio (IMR) was calculated and included in the model; it is presented on the results tables as Lambda. The earnings model was estimated separately for each religious group for both men and women. The coefficient of years of schooling was interpreted as returns to education, following a large body of literature since Mincer developed the earnings function in 1974.

Leimax (2006b) suggested that the HCEF may be adjusted to include a quartic function in labor market experience instead of just a quadratic, and to allow for a quadratic term in years of schooling to capture the growing convexity in the relationship between schooling and wages that has become apparent in recent years. In addition, the author suggested to control for cohort effects because of the extreme growth in returns to schooling among cohorts born after 1950. These changes to the specification of the estimated models were tested but the coefficients were not statistically significant and the results are not reported.

Generally, studies that have examined returns to education have used the Mincer equation (Mincer, 1974) that regresses the natural logarithm of the wage rate as a dependent variable on several independent variables including education, work experience and other controls; and have interpreted the coefficient of years of schooling as returns to education. The majority of these studies have used Ordinary Least Squares (OLS) regression methodology. Some studies have also used required schooling laws and differences in the accessibility of schools, among other factors, to construct an Instrumental Variable (IV) for completed education.[35] These methods have generally provided slightly larger estimates; with results interpreted as reflecting high marginal costs of schooling as opposed to low ability among low-education subgroups (see a review of this literature in Card, 2001). In addition, a few studies have examined the returns to

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[35] The IV method is a standard solution to the problem of double causality issues. It is an observable covariate that affects schooling choices but is not correlated with ability.

education along the wage rate distribution using Quantile regression (QR). The analyses presented in this paper use OLS and QR methodologies. The PSID data set does not contain data that would permit construction of an IV variable, such as proximity to school from an individual's place of residence.

8.3. <u>Empirical Findings: OLS Regression Estimates</u>

8.3.1. <u>Non-Hispanic White Women</u>

Table XVII presents the OLS regression estimates of returns to education for non-Hispanic white women (WW). The rates of return to education were estimated at 13% for MP women, at 12.9% for CP women and at 11.5% for Catholic women. These estimates are not statistically different from each other. Lehrer (1999) also concluded that the rates of return to education are not statistically significantly different for these religious groups, reporting estimates of 8.4% for MP women, 10.8% for CP women and 9.9% for Catholic women. While the estimated rates of return in this study are larger, they are consistent with historical trends of increasing returns to education (Lemieux, 2006b), given the more recent data set used in this thesis.

TABLE XVII

RETURNS TO EDUCATION, OLS REGRESSION ESTIMATES,
WW, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	Mainline Protestants		Conservative Protestants		Catholics	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Years of schooling	0.130***	(0.018)	0.129***	(0.020)	0.115***	(0.014)
Years of work experience	0.010**	(0.004)	0.011***	(0.004)	0.011**	(0.004)
Region of Residence						
Northeast	0.28***	(0.10)	0.21*	(0.12)	0.12	(0.08)
North Central	0.15*	(0.08)	-0.06	(0.06)	0.10	(0.08)
West	0.15#	(0.09)	0.05	(0.07)	0.21**	(0.10)
Rural Area	-0.41***	(0.11)	-0.36***	(0.13)	-0.35#	(0.22)
Constant	0.41	(0.34)	0.54**	(0.37)	1.01***	(0.31)
Lambda	0.71***	(0.24)	0.49**	(0.22)	0.13	(0.27)
Adjusted R^2	0.17		0.13		0.16	
N	378		445		417	

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[e] Significance t-tests showed that the differences of the years of schooling estimates are not statistically significantly different from each other.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

8.3.2. Non-Hispanic White Men

The OLS regression estimates of returns to education for non-Hispanic white men (WM) are shown in Table XVIII. The rates of return to education for men show more differentiation by religious group than do the rates of return for women. CP white men have significantly lower rates of return to education than their MP and Catholic counterparts do. Returns to education for CPs were estimated at 6.1%, compared to 11.4% and 10.5% for their MP and Catholic

counterparts, respectively. Lehrer (1999) reported that returns to schooling for MP, CP and Catholic men were not statistically significantly different from each other. The difference in rates of return for CP men in this analysis compared to previous findings may be due to differences in the age group or a historical change of the rates of return to CP men. To further examine these differences, rates of return to education were estimated for a male sample that includes the same age group, 27—44. These estimates are presented in Table XIX. The estimated coefficients of 9.0% and 9.1% for MPs and CPs, respectively, are very similar to the estimates of 9.4% and 9.8% for MP and CP men, respectively, in Lehrer (1999).

As we exclude the older population, the average returns to schooling for MP men decrease while the average returns to schooling for CP men increase. These results suggest that older CP men have lower returns to education, which could be both an age effect as well as a cohort effect.

TABLE XVIII

RETURNS TO EDUCATION, OLS REGRESSION ESTIMATES,
WM, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	Mainline Protestants		Conservative Protestants		Catholics	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Years of schooling	0.114***	(0.014)	0.061***	(0.012)	0.105***	(0.016)
Years of work experience	0.002	(0.003)	0.006***	(0.002)	0.006	(0.004)
Region of Residence						
Northeast	0.09	(0.09)	-0.19*	(0.10)	0.07	(0.08)
North Central	-0.17*	(0.07)	-0.12**	(0.06)	0.04	(0.07)
West	-0.10	(0.08)	0.02	(0.07)	0.19**	(0.08)
Rural Area	-0.29***	(0.11)	-0.05	(0.11)	-0.29#	(0.19)
Constant	1.67***	(0.22)	2.29***	(0.19)	1.63***	(0.30)
Lambda	-0.82**	(0.34)	-0.83***	(0.20)	-0.44	(0.57)
Adjusted R^2	0.16		0.13		0.17	
N	450		527		515	

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[e] Significance t-tests showed statistically significant difference at 1% between the coefficients of years of schooling for CPs and MPs, at 5% between CPs and Catholics, and no statistical significance between MPs and Catholics.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XIX

RETURNS TO EDUCATION, OLS REGRESSION ESTIMATES,
WM, AGE 27–43, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	Mainline Protestants		Conservative Protestants		Catholics	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Years of schooling	0.090***	(0.022)	0.091***	(0.015)	0.012***	(0.020)
Years of work experience	0.017*	(0.017)	0.010#	(0.016)	0.002	(0.005)
Region of Residence						
Northeast	0.11	(0.13)	-0.07	(0.13)	0.07	(0.09)
North Central	-0.24**	(0.11)	-0.07	(0.08)	0.01	(0.09)
West	0.01	(0.12)	-0.04	(0.09)	0.11	(0.11)
Rural Area	-0.38**	(0.16)	0.09	(0.14)	-0.24	(0.19)
Constant	2.18***	(0.40)	1.76***	(0.23)	1.33***	(0.35)
Lambda	-1.61**	(0.75)	-0.65**	(0.33)	0.38	(0.69)
Adjusted R^2	0.16		0.11		0.17	
N	222		306		277	

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[e] Significance t-tests showed that years of schooling coefficients are not statistically significantly different from each other.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

8.4. Empirical Findings: Quantile Regression Estimates

Recent research studies have recognized the variation of returns to education along the

wage rate distribution, and have used the Quantile regression (QR) methodology to examine

these differences (Lemieux, 2006b; Chiswick and Huang, 2008). This study also employs the

QR estimation technique to estimate the returns to education along the wage rate distribution for the three U.S. major religious groups with sufficient sample size—MPs, CPs and Catholics.

Table XX presents the Quantile regression estimates of returns to education for MPs, CPs and Catholics. Both gender groups are displayed—non-Hispanic white women (WW) and non-Hispanic white men (WM). For simplicity, only the coefficients of the years of education are shown and the full regression models are shown in Appendix B. The OLS estimates are shown in the first column and the QR estimates are shown in the rest of the columns. These estimates are also visually illustrated in Figures 13–15.

Figure 13 displays the returns to education for MP women and men. Based on the OLS estimate, the returns to schooling for MP men and women are not significantly different from each other. However, the QR reveals that the returns to education vary along the wage rate distribution for both men and women, and the patterns appear to have gender-specific characteristics: at low wages the returns to education for MP men are lower than the returns to education for MP women, while at high wages the returns to education for men and women converge. The returns to education for men are low at low wages and increase as wages increase, from 7.6% at the lowest to 12.9% at the highest decile (see Table XX). The returns to education of MP women increase only at the lowest three deciles, then stay generally flat throughout the middle deciles and decrease at the highest three wage deciles.

CP women have fairly uniform returns to schooling throughout the wage distribution that are also higher than the returns to schooling for CP men (shown in Figure 14).[36] CP men have much lower returns to education although the pattern along the wage distribution is similar to the

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[36] The rate of return to schooling for CP women is much lower in decile 8, perhaps due to small sample size.

pattern of their MP counterparts; i.e., low at low wages and increasing as wages increase, from 4.6% at the lowest to 8.8% at the highest decile (see Table XX).

In contrast, the rates of return to schooling for Catholic men and women are generally the same along the wage distribution, except at the highest two deciles where women have higher rates of return to schooling (shown in Figure 15 and Table XX).

The pattern of increasing rates of return to education as wages increase for MP and CP men is in line with previously reported returns to education results for white native born men. Chiswick et al. (2006) reported average returns to education for white native born men ranging from 8% at the lowest to 12% at the highest decile (see Table XX). The returns to schooling of MP men are almost identical to the average rates of return for men. The rates of return to schooling for CP men are much lower across the wage rate distribution but follow a similar pattern.

Figure 13. Returns to education for mainline Protestants, WW and WM, based on the OLS and Quantile regression estimates, age 27–64
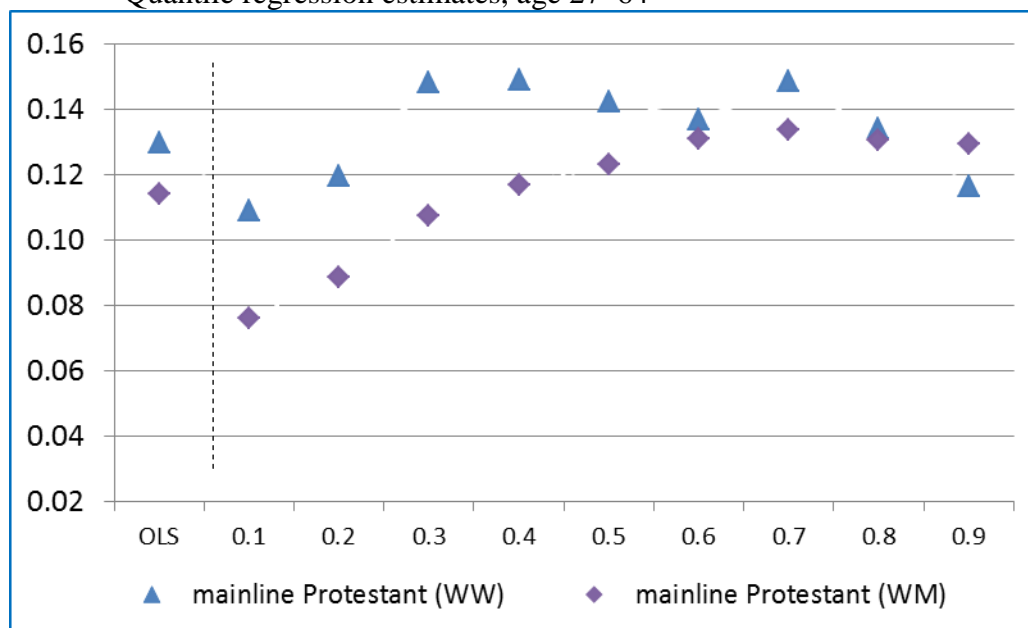
Source: Table XX.

Figure 14. Returns to education for conservative Protestants, WW and WM, based on the OLS and Quantile regression estimates, age 27–64
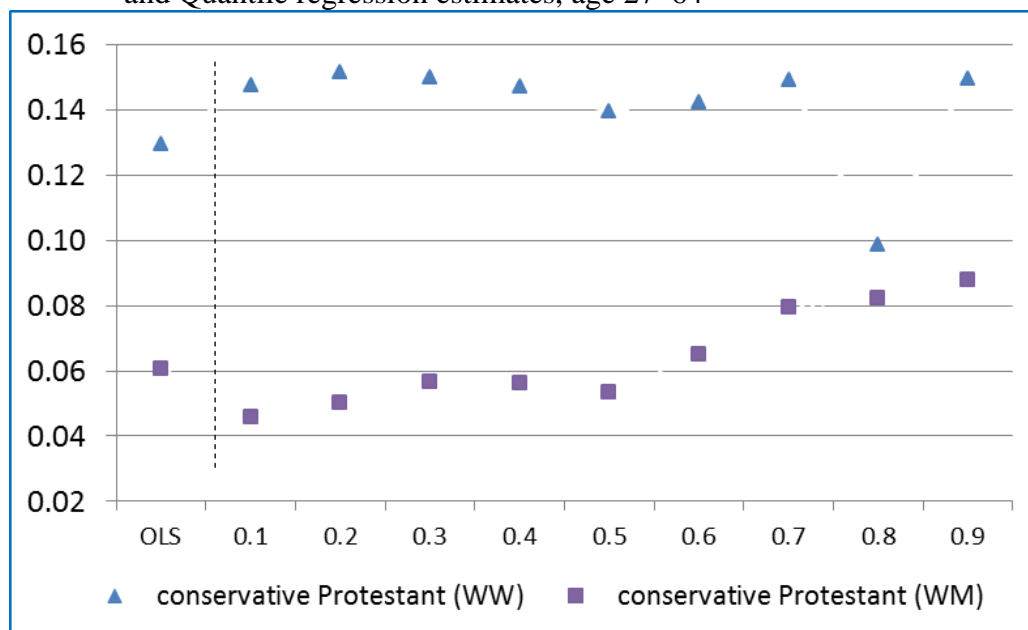
Source: Table XX.

Figure 15. Returns to education for Catholics, WW and WM, based on the OLS and Quantile regression estimates, age 27–64
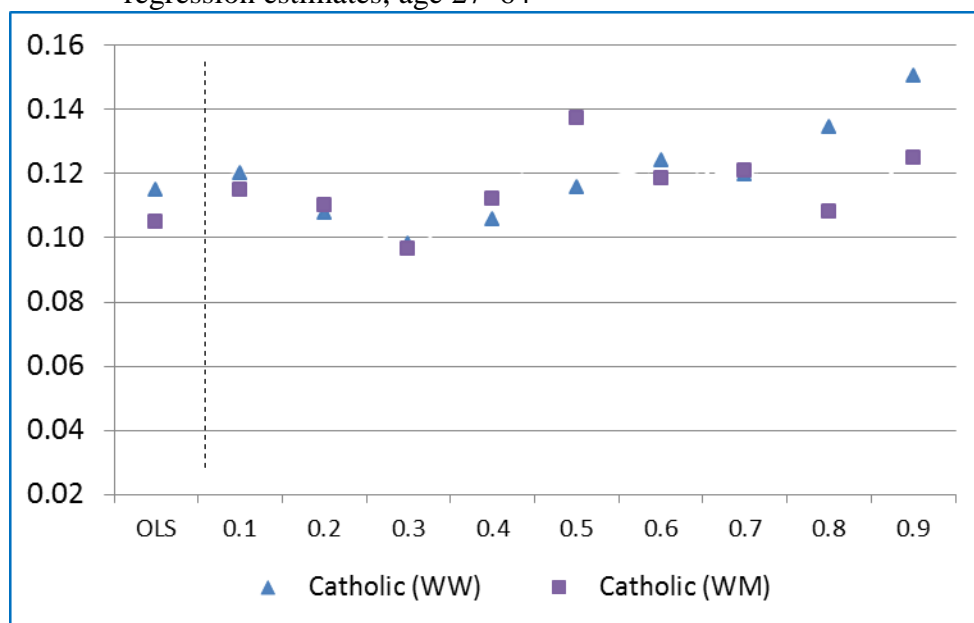
Source: Table XX.

TABLE XX

RETURNS TO EDUCATION, OLS AND QUANTILE REGRESSION ESTIMATES,
WW AND WM, 27–64 YEARS OLD, PSID DATA, SURVEY YEAR 2005 [a, b, c, d, e, f, g]

Religion (Gender)	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Mainline Protestant (WW)	0.130***	0.109***	0.12***	0.148***	0.149***	0.143***	0.137***	0.149***	0.134***	0.117***
	(0.018)	(0.038)	(0.024)	(0.019)	(0.019)	(0.017)	(0.017)	(0.029)	(0.032)	(0.019)
Conservative Protestant (WW)	0.129***	0.148**	0.152***	0.150***	0.147***	0.140***	0.143***	0.149***	0.099***	0.150***
	(0.020)	(0.042)	(0.029)	(0.026)	(0.025)	(0.023)	(0.021)	(0.023)	(0.022)	(0.029)
Catholic (WW)	0.115***	0.120***	0.108***	0.098***	0.105***	0.115***	0.124***	0.119***	0.134***	0.150***
	(0.014)	(0.033)	(0.021)	(0.019)	(0.014)	(0.013)	(0.018)	(0.016)	(0.018)	(0.019)
Mainline Protestant (WM)	0.114***	0.076***	0.089***	0.108***	0.117***	0.123***	0.131***	0.134***	0.131***	0.129***
	(0.014)	(0.038)	(0.023)	(0.017)	(0.017)	(0.018)	(0.017)	(0.016)	(0.015)	(0.015)
Conservative Protestant (WM)	0.061***	0.046***	0.050***	0.057***	0.056***	0.054***	0.065***	0.080***	0.082***	0.088***
	(0.012)	(0.023)	(0.017)	(0.015)	(0.014)	(0.013)	(0.014)	(0.014)	(0.014)	(0.016)
Catholic (WM)	0.105***	0.115***	0.110***	0.097***	0.112***	0.137***	0.118***	0.121***	0.108***	0.125***
	(0.016)	(0.030)	(0.020)	(0.020)	(0.017)	(0.020)	(0.018)	(0.019)	(0.018)	(0.024)

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

[g] Full regression results are shown in Appendix B.

8.4.1. Differentials in Rates of Return to Education by Religious and Gender Groups

Returns to education for MP, CP and Catholic men and women were reported in the previous sections. The returns to education were estimated at the mean with the OLS regression methodology and along the wage rate distribution with the QR technique. The estimates show that women generally have higher rates of return than men at the mean as well as along the wage rate distribution. In addition, CP men have the lowest rates of return to schooling, lower than the returns to schooling of CP women as well as their MP and Catholic male counterparts.

Based on the OLS estimates, the rates of return to education for WW are not statistically different between the three major religious groups examined in this study: MP, CP and Catholics. Differences in the rates of return to education between religious groups for WM are apparent, however, although the point difference between MPs and Catholics is not statistically significant. CP men have the lowest returns to education if individuals 27–64 years old are considered. If only younger CP men are considered, the rates of return to education are similar to the rates of return to education of MP men. This finding suggests that the rates of return to education of CP men decrease as they age while the rates of return to education of MP and Catholic men increase as they age. The relatively low rate of return to education for CP men may in part reflect the types of occupations CPs choose—CPs are at the lower rungs of the occupational structure (Keister, 2011, p. 65; Sherkat, 2012). They typically choose occupations outside of the sciences with low wage rates due to their literal interpretation of the Bible and reservations toward the scientific method (Darnell and Sherkat, 1997). This trend may also be a reflection of the cohort effect, as the differences between CPs and MPs in measures such as fertility, marriage, work and income patterns have been decreasing in recent years (Keister, 2011, p. 152–153).

The estimates of the rates of return to education for CP men in this study indicate a relatively low rate of return for this group, which suggests that the demand forces dominate in this group. This may be due to various reasons, including productivity effects associated with early investments in human capital, authoritarian approach to knowledge, and occupational choices that tend to shift the demand curve to the left. Based on the empirical results, the investment to schooling and the rate of return to schooling for CP men may look as illustrated in Figure 16.

Figure 16. Supply and demand of funds for investment in schooling for conservative Protestant men, relative to the reference group, mainline Protestants
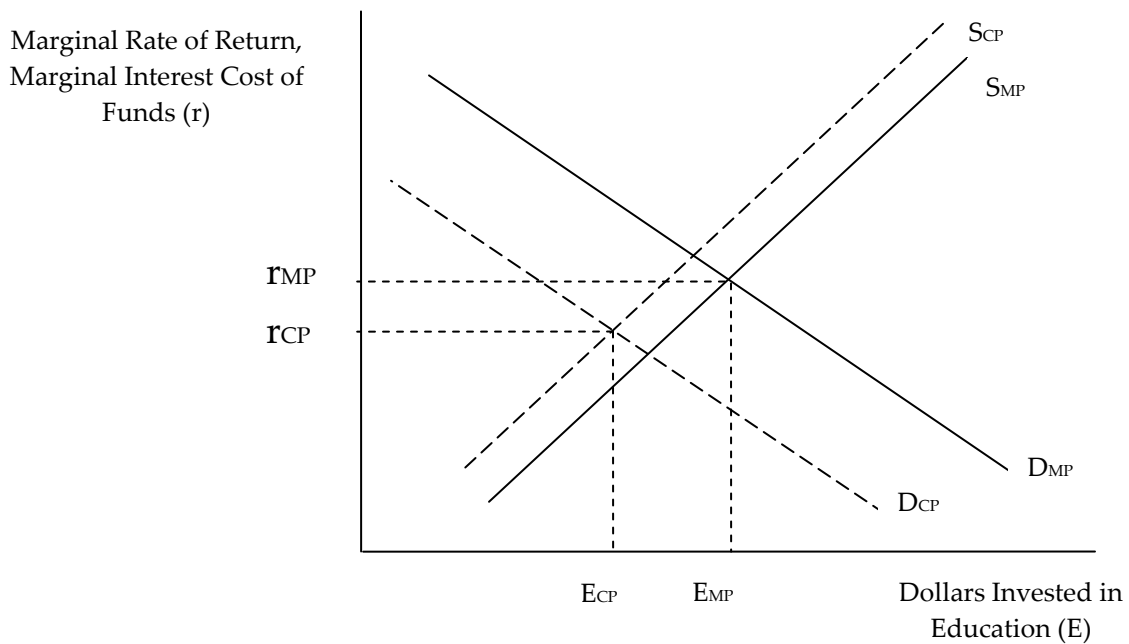
Note: Equilibrium level of schooling for CP men is E_{CP}, lower than the equilibrium level of schooling for MP men E_{MP}. Equilibrium rate of return to schooling for CP men is r_{CP}, lower than the rate of return to schooling for MP men, r_{MP}.

9. THE ROLE OF RELIGIOUS PARTICIPATION IN INFLUENCING WAGES

Many Americans get up every Sunday morning and go to their worship place. Some people do not make this trip every Sunday, but perhaps every other Sunday or even more rarely. Yet others make this trip during weekdays as well. Does attendance at religious services affect individuals' well-being? Does the frequency of attendance matter?

Ample evidence indicates that religious participation is associated with socioeconomic outcomes such as education, health, family formation and wealth accumulation. Some studies have also shown that religious participation is associated with wage rates. Moreover, current studies have established that the degree of religious participation matters. For example, Chiswick and Huang (2008) find that moderate attendance at religious services has positive effects on earnings while very high levels of attendance at religious services have adverse effects. One of the goals of this Chapter is to further examine the adverse effects of very high participation in religious services on wages, including differences between religious groups, differences by gender, and differences along the wage rate distribution.

This Chapter adds to the limited literature examining the relationship between religious participation and wages. It examines the within-religion effects of religious participation on wage rates for the three major U.S. religious groups with sufficient sample size: MPs, CPs and Catholics. Four levels of religious attendance were defined: weekly, more often than weekly, less often than weekly, and none. These levels enable detection of non-linearity in the association between religious participation and wage rates. Differences in the association of religious participation with wage rates between religious groups are discussed, as well as differences by gender within religious groups. Finally, differences along the wage rate distribution are examined.

In the next section, the current literature examining the effect of religious participation on wage rates and other socioeconomic outcomes is surveyed. Then a theoretical framework and expectations are developed, followed by a discussion of empirical findings.

9.1. <u>Literature Review</u>

Religious participation may influence wages through two main pathways. First, as discussed below in section 9.2, some religious participation may be beneficial: religious involvement can provide social networks and psychological benefits, and it can encourage healthier lifestyles. Second, religious participation can make the effect of religious affiliation more pronounced—as those who are more committed to a religion will generally adhere more closely to the teachings of the religion. As a result, more participation could be associated with higher wage rates for some religious groups and with lower wages for others, depending on whether the particular religion promotes or discourages time with family or labor market activities.

The literature examining the association between religious participation with wages and other socioeconomic outcomes has evolved in many ways. Earlier studies specified religious participation as a dichotomous or continuous variable, while more recent studies have defined religious participation to permit detection of non-linear effects.

A sizable literature has documented an association between religious participation and beneficial socioeconomic outcomes such as greater educational attainment, better health, greater longevity, marital stability and wealth. But the literature that has examined the religious participation–wages relationship is very limited.

9.1.1. Association between Religious Participation and Wages and other Socioeconomic Outcomes

Numerous studies have found that some participation in religious services has a positive association with a wide array of beneficial socioeconomic outcomes. Generally, earlier studies specified religious participation as a dichotomous or continuous variable. These studies found that some religious participation is associated with better educational outcomes (Muller and Ellison 2001; Regnerus 2000; Lehrer 2010), greater marital stability (Vaaler et al., 2009), greater wealth accumulation (Keister, 2003; Keister, 2011) and a variety of positive health-related outcomes such as lower substance abuse and lower juvenile delinquency (Donahue and Benson, 1995), lower incidence of depression among some groups (Harker, 2001), delayed sexual debut (Bearman and Bruckner, 2001), delayed entry into cohabitation (Lehrer, 2004a), more negative attitudes toward unmarried sex and premarital childbearing (Marchena and Waite, 2002) and longer and healthier life spans (Strawbridge et al., 1997; Hummer, Rogers, Nam, and Ellison, 1999).

A few studies in the economics literature have developed methodologies to estimate the causal effect of religious participation on socioeconomic outcomes and have found that religious participation has a positive effect on marital stability, educational attainment and income (Gruber, 2005), decreased levels of drinking and drug use (Gruber & Hungerman, 2008) and increased levels of happiness (Cohen-Zada & Sander, 2008).

More recently, two studies have suggested that at very high levels of religious participation, the effects of such participation may become adverse (Chiswick and Huang, 2008; Lehrer et al., 2009). Lehrer et al. (2009) found that college-educated women raised with some religious involvement were less likely to experience intimate partner violence; however, these

positive effects disappeared at very high levels of religious participation. The authors interpreted the positive effect of some religious participation as reflecting the healthier, less risky lifestyles these individuals generally lead, and the reversal at very high levels of religious participation as due to "extreme views and role models, e.g., where the sacredness of family unity is seen as foremost (ruling out divorce even in the face of spousal abuse), or where submissiveness on the part of women is viewed as a key quality" (Lehrer et al., 2009, p. 637).

Chiswick and Huang (2008) used the 2000–01 National Jewish Population Survey and allowed for non-linearity of religious participation effects by using a set of dummy variables for various levels of participation. They found that the effect of religious participation on earnings did indeed display a non-linear pattern, namely, individuals who attended religious services weekly had significantly higher earnings than those who attended religious services less frequently. However, those who attended religious services *more often than weekly* had lower earnings than those who attended weekly. These findings were interpreted as reflecting the scarcity of time; i.e., an individual's limited amount of time can be spent either at religious services or in labor market activities. In addition, a very high level of religious participation may be associated with "self-imposed restrictions" that adversely affect earnings, such as the choice of occupation, residence, location of work and days of work. These "self-imposed restrictions" are likely to have similar detrimental effects on wages at very high levels of participation in religious activities for other religious groups as well.

Despite the attention that has been given to the relationship between religious participation and other socioeconomic outcomes, studies that have examined the association between religious participation and wages are very limited. In one study, Lehrer (2010) examined differences in the effect of religious participation on wage rates for non-Hispanic

white females, 27–44 years old. Using data from the 1995 National Survey of Family Growth

(NSFG), Lehrer (2010) found that religious participation at age 14 had little or no effect on the

wages of adult women, a result which held for the three religious groups considered: Catholics,

CPs and MPs. Religious participation was defined as a dichotomous variable with values of high

and low attendance at religious services. This Chapter extends on this work by examining

differences in religious participation rates in greater detail to account for potential non-linearity,

by including analyses of men also, and by incorporating a larger age group.

9.2. Theoretical Framework and Expectations

9.2.1. Religious Participation Can Provide Beneficial Effects when in Moderate Amount

One of the pathways through which religious participation could influence wage rates is

via positive effects on individuals' well-being. Religious involvement can have a "social capital

effect" that integrates people into supportive networks, a "regulative effect" because of the

healthful behaviors that most religions promote, and a "psychological effect" because some

involvement in religious activities can have psychological benefits (Waite and Lehrer, 2003).

Religious attendance may have a positive effect on socioeconomic outcomes including

wages because individuals who attend religious services have larger "social networks" than

individuals who are not involved with religious groups (Ellison and George, 1994). Worshipers

who attend religious services become integrated into social groups and have a sense of

community, and this community can support them emotionally by offering sympathy and

encouragement. The assistance can also be more tangible, such as assisting with tasks, materials

or even money. Social networks may be especially beneficial for those who are in stressful

situations such as experiencing health problems, providing care to family members or dealing

with unemployment. Social networks built through religious participation may be beneficial to individuals in the labor market by helping job seekers move out of unemployment or find better-suited jobs that may offer higher wages.

Most religious traditions also provide a "regulative effect" by promoting good moral values and healthful behaviors. Religious participation has been associated with lower probability of substance abuse and juvenile delinquency (Donahue and Benson 1995), lower smoking rates (Strawbridge et al., 1997) and delayed sexual debut (Bearman and Bruckner, 2001).

In addition, some religious involvement can provide a "psychological effect" because involvement in religious activities can have psychological benefits. Studies have shown that religious involvement is associated with lower incidence of depression among immigrant adolescents (Harker, 2001) and a variety of other groups as summarized and discussed in Levin (1994). Some religious involvement can reduce feelings of helplessness and increase optimism, although these benefits are difficult to quantify.

Despite the positive social and psychological benefits of some religious participation, very high levels of religious attendance can have negative effects on individuals' well-being. It has been suggested that adverse effects may be found at very high levels of religious participation in the context of increased intimate partner violence (Lehrer et al., 2009). Chiswick and Huang (2007) find adverse effects in the context of earnings. Non-linear effects of religious participation are expected because very high rates of religious participation may be associated with behaviors that do not enhance individual's well-being, under the influence of religious pressure and expectations.

High levels of religious participation may also be associated with self-imposed restrictions that adversely affect earnings, such as the choice of occupation, residence, location of work and days of work. In addition, very high levels of religious participation involve trade-offs of time between religious and labor market activities. Beyond a certain level of religious attendance, time and effort allocated to religious activities may crowd out time and effort allocated to labor market activities (Chiswick and Huang, 2007).

9.2.2. Religious Participation Enhances the Effect of Religious Affiliation

Another pathway through which religious participation can affect wages is through accentuating the effects of religious affiliation on economic and demographic outcomes, because congregants of a given religious group increase their stock of religious human capital through participation in religious services (Iannacconne, 1990). The effects of religious participation on wages should therefore be stronger for those individuals who participate in religious services more frequently and who follow more strictly the teachings of their faith. To the extent that religious groups differ in their teachings, the effect of religious participation on wages should differ by religious affiliation.

An important aspect on which religious groups differ is their attitude toward family— including family size, gender roles and the division of labor within the family unit. Some religions encourage families to have more children by approving and rewarding such behavior. The pronatalist ideologies of the Mormon church can explain the higher fertility of Mormon families (Stark and Finke, 2000). Historically, Catholicism has also promoted larger family size, has prohibited artificial forms of contraception, and has opposed abortion (Sander, 1995). Recently, however, the Catholic Church has weakened and there has been a decline in the birth rate in Catholics families (Jones and Westoff, 1979; Mosher et al., 1986; Goldscheider and

Mosher, 1991), and non-Hispanic Catholics have moved upward on the SES scale for outcomes such as educational attainment, earnings and wealth accumulation (Keister, 2011), converging to the MP patterns (Lehrer, 2004).

Religious groups may differ not only in their attitudes toward gender roles and in the division of labor within the family, but also in their underlying preferences toward occupational choice (Keister, 2011, p. 65) as some recent studies have shown differences among religious groups in their occupational choices (Darnell and Sherkat, 1997; Sherkat, 2012). For example, Glass and Nath (2006) suggest that CP women choose less demanding jobs with correspondingly lower wages.

9.2.3. Expectations

Existing studies have generally examined either one or the other pathway; i.e., studies have either examined the beneficial effects due to religious participation such as helpful social networks, psychological benefits and regulative effects, or they have examined the effect of religious participation due to accentuating the effects of the specific religious affiliation. However, these two pathways "may exert countervailing influences, and in addition, the effects of religiosity may vary by religious affiliation" (Lehrer, 2009, p. 223). Therefore, it is important to consider both pathways simultaneously.

In the paragraphs below, both effects are considered simultaneously in an attempt to disentangle the complex relationship between religious participation and wage rates; and thereby to derive reasonable expectations of the net effect of religious participation on wage rates. Table XXI helps to visualize and reason through the expected effect of religious participation on wage rates by religious group for men and women. It considers each of the pathways separately.

The effects of religious participation on wages via the first pathway are expected to be similar for all religious groups. Some religious involvement may provide a positive effect on wages for all religious groups, due to the social capital effect, the regulative effect, and the psychological benefits that can be associated with some participation in religious activities. Very high levels of religious involvement, however, are likely to have adverse effect on wages because time spent at religious services will be traded off for time that could have been spent in the labor market improving the chances of a higher wage rate and income. In addition, at very high levels of religious participation, behaviors that do not enhance well-being may be visible.

The effects of religious participation on wages via the second pathway are more complex. The different teachings of CPs, Catholics and MPs lead to different outcomes between those three groups, which are explored in the following paragraphs.

CPs tend to interpret the Bible in its literal sense, which can lead to reservations toward the scientific method (Darnell and Sherkat, 1997). This in turn may contribute to less-developed critical thinking skills for individuals affiliated with the faith. CPs also tend to oppose secular education and at the same time are faced with limited opportunities to attend religious educational institutions (Lehrer, 1999). Men affiliated with the faith with moderate attendance at religious services may experience a detrimental effect on wages because they oppose the scientific method (Darnell and Sherkat, 1997) and as a result may choose occupations typically at the lower rungs of the occupational structure (Keister, 2011, p. 65; Sherkat, 2012), which pay lower wages. CP men with very high religious participation who follow these religious practices more strictly may incur larger decreases in their wages.

The CP religion may also affect wage rates by promoting family values and traditional gender roles in the family. In addition to the potential negative effect on wages among CP men

caused by resistance to the scientific method, the traditional family values and intra-family division of labor of this religion may detrimentally affect wages for women. The "more traditional behaviors regarding the intra-family division of labor and the corresponding negative repercussions for female wages are expected to be more pronounced among conservative Protestants who are more observant" (Lehrer, 2010, p. 201).

MPs have generally been used as a benchmark in the literature that has examined the effect of religion on socioeconomic outcomes. MPs have historically maintained high achievement and Socio Economic Status (SES). The MP religion is liberal in nature and the effect of religious participation on wages through the second pathway can be viewed as neutral.

Catholics have converged to the MP patterns in most aspects of economic and demographic behavior, and the effects for Catholics are likely zero.

TABLE XXI

EFFECT OF RELIGIOUS PARTICIPATION ON WAGES DUE TO TWO PATHWAYS, WW AND WM: EXPECTATIONS [a]

	Pathway 1: some, but not very high religious participation provides beneficial effects		*Pathway 2*: religious participation enhances the effect of religious affiliation	
	Women / Men		Women	Men
Religious Participation / Religious Affiliation	Some	Very high	Some / Very high	Some / Very high
mainline Protestant	+	-	none	none
conservative Protestant	+	-	- -	-
Catholic	+	-	none	none

[a] The symbols (-), (- -), and (+) represent the following:
−   denotes negative effect
---   denotes stronger negative effect
+   denotes positive effect

9.3. **Empirical Findings: Association between Religious Participation and Wage Rates for**

MPs, CPs and Catholics

Four levels of attendance at religious services were defined: more often than weekly, weekly, less than weekly and none. This division allows detection of non-linearities. The association between religious participation and wage rates was examined separately for MPs, CPs and Catholics. The samples of other religious groups were too small for statistical analyses.

The religious attendance variables were included in the wage regressions and the model was estimated for each religion using weekly attendance as the reference category. The model was estimated using the OLS regressions as well as the Quantile regression methodology to examine differences in the effect of religious attendance along the wage rate distribution.

The first section below presents descriptive statistics for religious participation for the three religious groups included in the analyses. The second and third sections examine the regression estimates for MPs, CPs and Catholics, first focusing on white non-Hispanic women (WW) and then on white non-Hispanic men (WM). The subsequent section presents a discussion of gender differences within each religion.

9.3.1. **Descriptive Statistics**

The means and relative distribution of *religious participation* for WW and WM 27–64 years old are shown in Table XXII and Figures 17 and 18. Table XXII presents the overall means while Figures 17 and 18 display relative within group religious participation for the largest religious groups: CPs, MPs and Catholics.

The descriptive statistics show differences between religious groups in their frequency of attendance at religious services. Overall, CPs attend religious services more often than MPs and Catholics do, for both gender groups. Among women, while 25% and 24% of Catholics and

MPs, respectively, attend religious services weekly or more often than weekly, a considerably larger percent of CPs attend religious services weekly or more often (36%). Similar relative differences between religious groups are evident for men: while 29% and 25% of Catholics and MPs, respectively, attend religious services weekly or more often, 38% of CP men attend religious services weekly or more often.

Significance tests of the differences between women and men at each religious attendance level showed that there is no significant difference of religious attendance between men and women, except for MPs with moderate to low attendance of religious services. This male–female difference is statistically significant at the 10% significance level.

TABLE XXII

DEFINITIONS AND MEANS OF ADULT RELIGIOUS PARTICIPATION[a],
WW AND WM, AGE 27–64, PSID 2005 SURVEY YEAR

Religious Participation (for largest groups only)[b]	Definition	WW 27–64, PSID data	WM 27–64, PSID data
Very High	More than once a week	0.06	0.07
High (reference category)	Once a week	0.19	0.20
Moderate to Low	Less than once a week	0.41	0.43
None	Never attends religious services	0.34	0.30
Mainline Protestant / very high		0.01	0.01
Mainline Protestant / high		0.05	0.05
Mainline Protestant / moderate to low [c]		0.11	0.12
Mainline Protestant / none		0.07	0.06
Conservative Protestant / very high		0.04	0.04
Conservative Protestant / high		0.07	0.06
Conservative Protestant / moderate to low		0.11	0.11
Conservative Protestant / none		0.07	0.06
Catholic / very high [d]		0.006	0.008
Catholic / high		0.06	0.07
Catholic / moderate to low		0.12	0.13
Catholic / none		0.08	0.06
$N =$		1,567	1,942

[a] See details on specification of the religious participation variable in Chapter 5, Section 5.3.

[b] The means of these variables, plus the means for the Jewish, Mormon and no religion groups, add to 1.

[c] Significance *t*-tests showed statistically significant differences between men and women at the 10% significance level for the MP / moderate to low attendance of religious services category.

[d] Note that the Catholic / very high attendance group is relatively small.

Figure 17. Relative distribution of religious participation[a] by religious group, WW, age 27–64
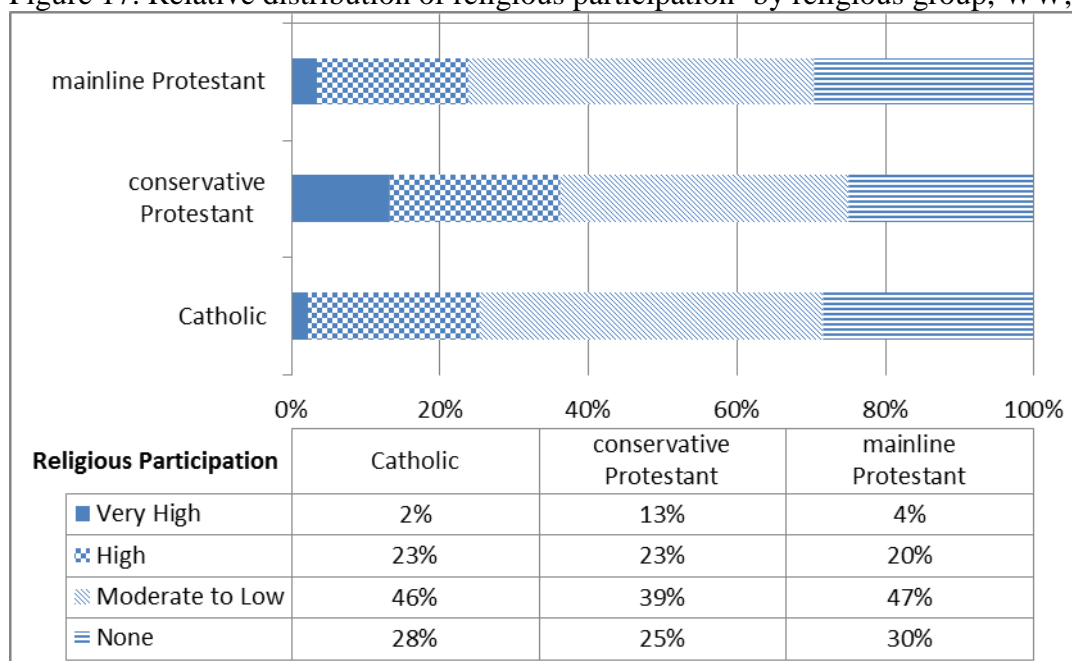
Religious Participation	Catholic	conservative Protestant	mainline Protestant
■ Very High	2%	13%	4%
▨ High	23%	23%	20%
▧ Moderate to Low	46%	39%	47%
≡ None	28%	25%	30%

[a] Religious participation categories for each religious group add to 100 percent; there may be some exceptions because of rounding.

Figure 18. Relative distribution of religious participation[a] by religious group, WM, age 27–64
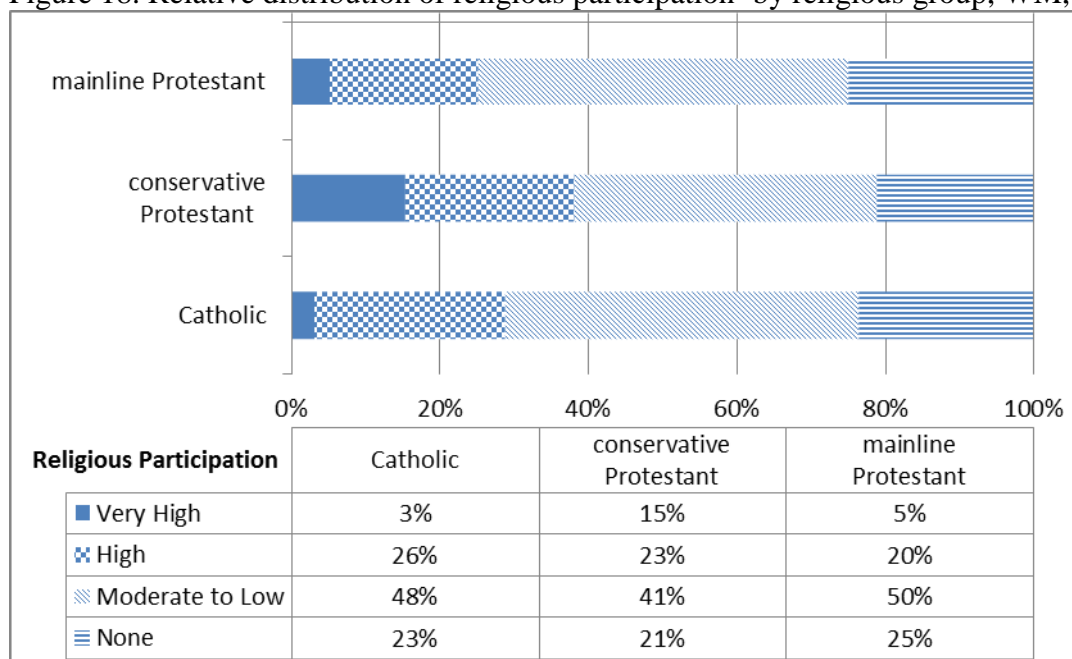
Religious Participation	Catholic	conservative Protestant	mainline Protestant
■ Very High	3%	15%	5%
▨ High	26%	23%	20%
▧ Moderate to Low	48%	41%	50%
≡ None	23%	21%	25%

[a] Religious participation categories for each religious group add to 100 percent; there may be some exceptions because of rounding.

9.3.2. Multivariate Analyses

9.3.2.1. Non-Hispanic White Women (WW)

Tables XXIII, XXIIV and XXV and Figures 19, 20 and 21 show the regression estimates for MPs, CPs and Catholics, respectively. Regression estimates based on OLS and the Quantile regression (QR) methodologies are presented and discussed below.

The association of religious participation with wages for MP white women is presented in Table XXIII and Figure 19. Estimates at the mean based on OLS are presented in the first column, and estimates at each wage rate decile based on the QR methodology are presented in subsequent columns.

Consistent with expectations, the OLS estimates reveal statistically significant non-linear effects of religious participation on wage rates for MPs. Compared to women who attend religious services weekly, those who attend religious services more often than weekly have a 35% wage disadvantage (equivalent to the coefficient of negative 0.43) and those who do not attend religious services at all have a 13% wage disadvantage (a coefficient of negative 0.14). The coefficient for MP women who attend religious services less than weekly is not statistically significant.

The QR estimates revealed some differences in the effect of religious attendance for low wages versus high wages (Figure 19). Very high attendance at religious services has adverse effects on wages across the wage rate distribution; however, the wage disadvantage is more pronounced at low wages. The time spent at religious activities is more detrimental in terms of lower wages if a MP woman is at the lower wage end of the wage distribution. The penalty of not participating in religious services is evident at low and high wages, but not around the median.

Within religion effects for *CP* women are presented in Table XXIV and Figure 20. The models were estimated in a similar fashion as the models for MPs. OLS regression was estimated at the mean and Quantile regressions were estimated at each decile along the wage rate distribution. Based on OLS, it appears that religious participation does not affect wage rates for CP women and no clear patterns emerge from the Quantile regressions. This may be in part a reflection of the low variance of wages among CPs as shown in Table XIV.

The effects of religious participation on wage rates for white *Catholic* women have different patterns (Table XXV and Figure 21). Less religious Catholics have a wage premium over more observant members of their religion. At the mean, based on the OLS regression, the point estimates show that Catholic women who never attend religious services have a 9% wage benefit, based on a coefficient estimate of 0.09 (not statistically significant), compared to Catholic women who attend religious services on a weekly basis. This wage benefit for lapsed Catholic women is especially pronounced, in the range of 11% to 22% (coefficient estimates of 0.10 to 0.20), and with especially high statistical significance at high wage rates, as evidenced by the QR.

Other studies have reported that Catholics have a strong family focus (Tropman, 2002) that may have a negative effect on wages for women. However, recent patterns of lower fertility rates (Keister 2011, Chapter 2) may have a positive effect on wage rates for Catholic women. The wage premium is especially pronounced for those Catholic women who are at the upper end of the wage distribution and who do not attend religious services. This result suggests that lapsed Catholics may disproportionately include individuals with unobserved characteristics conducive to high wages.

Figure 19. Within religion effects of religious participation on wage rates, WW mainline Protestants, OLS and Quantile regression estimates, age 27–64
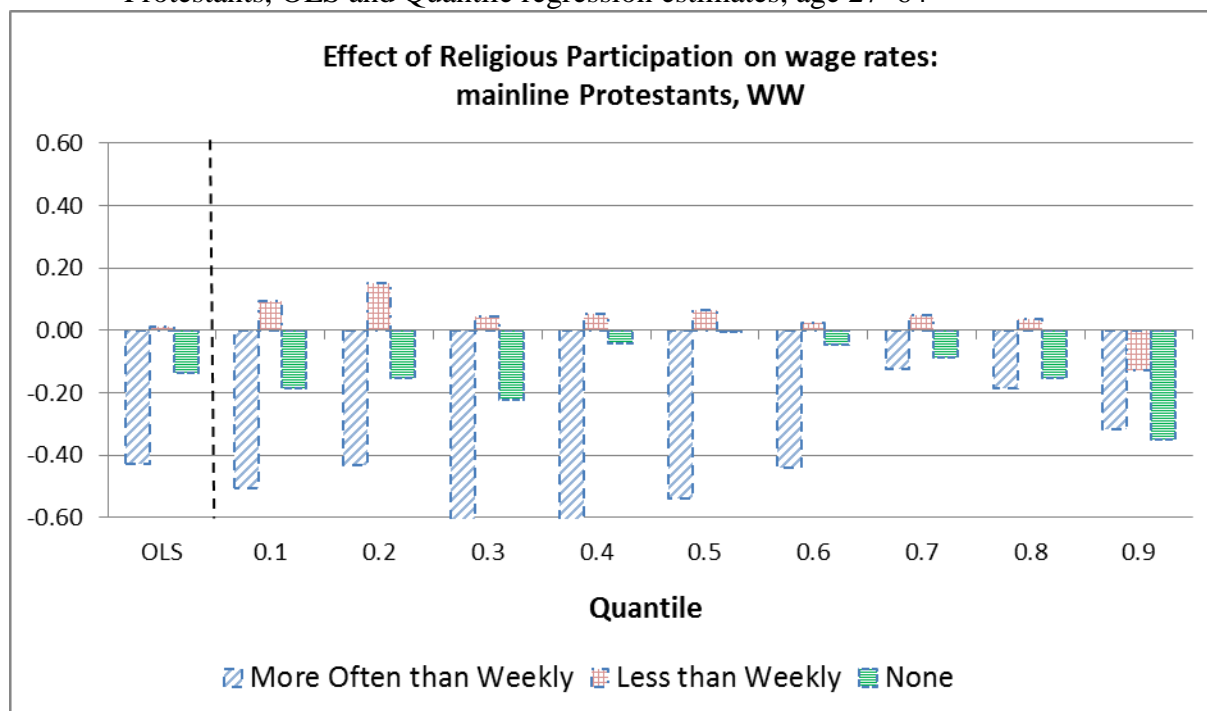
Figure 20. Within religion effects of religious participation on wage rates, WW conservative Protestants, OLS and Quantile regression estimates, age 27–64

Figure 21. Within religion effects of religious participation on wage rates, WW Catholics, OLS and Quantile regression estimates, age 27–64

TABLE XXIII

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, MAINLINE PROTESTANTS, WW, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Religious Attendance: mainline Protestant										
Weekly Attendance (reference category)										
More often than weekly	-0.43***	-0.51	-0.43*	-0.63***	-0.69***	-0.54*	-0.44	-0.12	-0.19	-0.32
	(0.16)	(0.55)	(0.26)	(0.23)	(0.21)	(0.31)	(0.34)	(0.32)	(0.29)	(0.61)
Less than weekly	0.01	0.09	0.15	0.04	0.05	0.07	0.02	0.05	0.04	-0.13
	(0.07)	(0.13)	(0.11)	(0.10)	(0.07)	(0.08)	(0.08)	(0.08)	(0.10)	(0.11)
None	-0.14#	-0.19	-0.15	-0.22#	-0.04	0.00	-0.04	-0.09	-0.15	-0.35**
	(0.08)	(0.15)	(0.14)	(0.14)	(0.12)	(0.08)	(0.09)	(0.08)	(0.10)	(0.15)
Control Variables										
Years of Schooling	0.13***	0.11***	0.13***	0.15***	0.14***	0.14***	0.14***	0.15***	0.12***	0.12***
	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Years of work experience	0.01**	0.00	0.01	0.01**	0.01***	0.01***	0.01***	0.01***	0.01	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Region of Residence										
Northeast	0.28***	0.17	0.19	0.27*	0.24*	0.22*	0.33***	0.33***	0.21#	0.32*
	(0.10)	(0.22)	(0.15)	(0.13)	(0.12)	(0.12)	(0.11)	(0.10)	(0.13)	(0.17)
North Central	0.14#	0.10	0.03	0.15	0.13	0.15*	0.15*	0.23***	0.10	0.21
	(0.08)	(0.15)	(0.13)	(0.11)	(0.09)	(0.09)	(0.08)	(0.08)	(0.11)	(0.14)

TABLE XXIII (continued)

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, MAINLINE PROTESTANTS,
WW, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
West	0.17*	-0.02	0.05	0.16	0.08	0.12	0.17*	0.21**	0.10	0.36*
	(0.09)	(0.18)	(0.16)	(0.11)	(0.09)	(0.10)	(0.10)	(0.09)	(0.13)	(0.19)
Rural Area	-0.41***	-0.41	-0.47*	-0.30#	-0.38***	-0.41***	-0.40***	-0.44***	-0.45***	-0.53***
	(0.11)	(0.40)	(0.24)	(0.19)	(0.13)	(0.11)	(0.13)	(0.16)	(0.13)	(0.18)
Constant	0.57#	0.29	0.22	-0.02	0.21	0.45	0.58	0.37	1.11*	1.41**
	(0.38)	(0.66)	(0.56)	(0.51)	(0.40)	(0.37)	(0.41)	(0.41)	(0.59)	(0.68)
Lambda	0.62**	0.52	0.48	0.65#	0.64*	0.37	0.45#	0.86***	0.78**	0.54
	(0.26)	(0.48)	(0.48)	(0.41)	(0.33)	(0.27)	(0.30)	(0.29)	(0.35)	(0.54)
Adjusted R^2	0.18									
N	378									

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[e] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXIV

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, CONSERVATIVE PROTESTANTS, WW, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Religious Attendance: conservative Protestant										
Weekly Attendance (reference category)										
More often than weekly	-0.08	-0.08	-0.13	-0.12	-0.06	0.02	-0.05	-0.13	-0.08	0.02
	(0.09)	(0.21)	(0.17)	(0.10)	(0.11)	(0.10)	(0.10)	(0.09)	(0.11)	(0.15)
Less than weekly	-0.04	-0.14	0.00	-0.02	0.07	0.07	-0.03	-0.13#	-0.10#	0.04
	(0.06)	(0.16)	(0.12)	(0.08)	(0.07)	(0.07)	(0.06)	(0.08)	(0.06)	(0.11)
None	-0.09	-0.13	-0.18	-0.12	-0.10	-0.04	-0.14#	-0.12	-0.10	-0.11
	(0.07)	(0.14)	(0.13)	(0.09)	(0.08)	(0.08)	(0.09)	(0.08)	(0.07)	(0.13)
Control Variables										
Years of Schooling	0.13***	0.15***	0.16***	0.14***	0.14***	0.14***	0.13***	0.14***	0.12***	0.11***
	(0.02)	(0.04)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Years of work experience	0.01***	0.02#	0.02*	0.01	0.01	0.01**	0.01***	0.01**	0.01*	0.01*
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Region of Residence										
Northeast	0.21*	0.26	0.21	0.22	0.14	0.32**	0.24**	0.22*	0.15	0.15
	(0.11)	(0.31)	(0.1775)	(0.16)	(0.16)	(0.15)	(0.11)	(0.11)	(0.14)	(0.26)
North Central	-0.06	-0.12	0.03	0.00	-0.07	-0.08#	-0.07	-0.07	-0.14	0.04*
	(0.06)	(0.15)	(0.1108)	(0.07)	(0.05)	(0.05)	(0.05)	(0.06)	(0.07)	(0.13)

TABLE XXIV (continued)

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, CONSERVATIVE PROTESTANTS, WW, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
West	0.05	-0.09	0.09	0.09	0.04	0.05	0.10	0.13#	0.03	0.22
	(0.07)	(0.24)	(0.14)	(0.08)	(0.08)	(0.09)	(0.08)	(0.08)	(0.08)	(0.19)
Rural Area	-0.36***	-0.89#	-0.55*	-0.55**	-0.55*	-0.18	-0.13	-0.12	-0.21	-0.20
	(0.13)	(0.58)	(0.32)	(0.25)	(0.30)	(0.30)	(0.22)	(0.18)	(0.22)	(0.46)
Constant	0.62*	-0.39	-0.44	0.03	0.25	0.29	0.71*	0.73#	1.39***	1.54***
	(0.36)	(0.72)	(0.54)	(0.44)	(0.41)	(0.41)	(0.38)	(0.46)	(0.46)	(0.54)
Lambda	0.49**	0.55#	0.83***	0.86***	0.69***	0.72***	0.48*	0.55*	0.22	0.24
	(0.21)	(0.35)	(0.29)	(0.24)	(0.24)	(0.24)	(0.26)	(0.29)	(0.29)	(0.35)
Adjusted R^2	0.13									
N	445									

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[e] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXV

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, CATHOLICS,
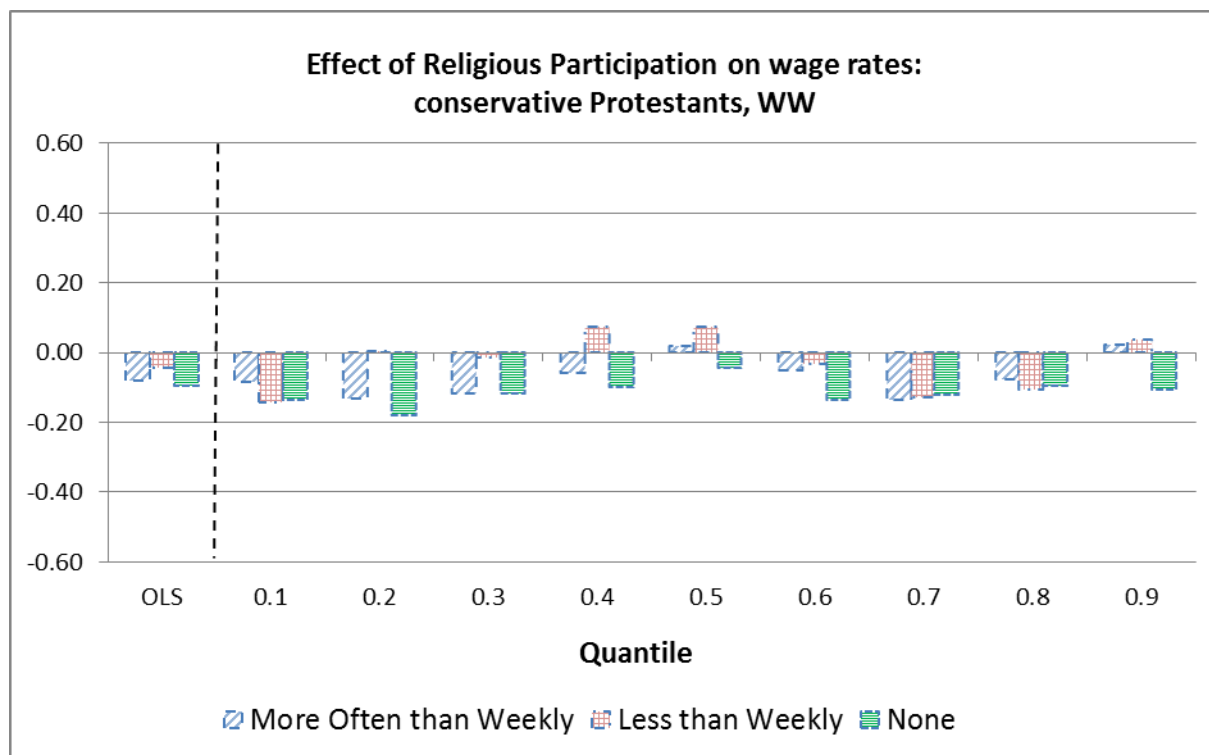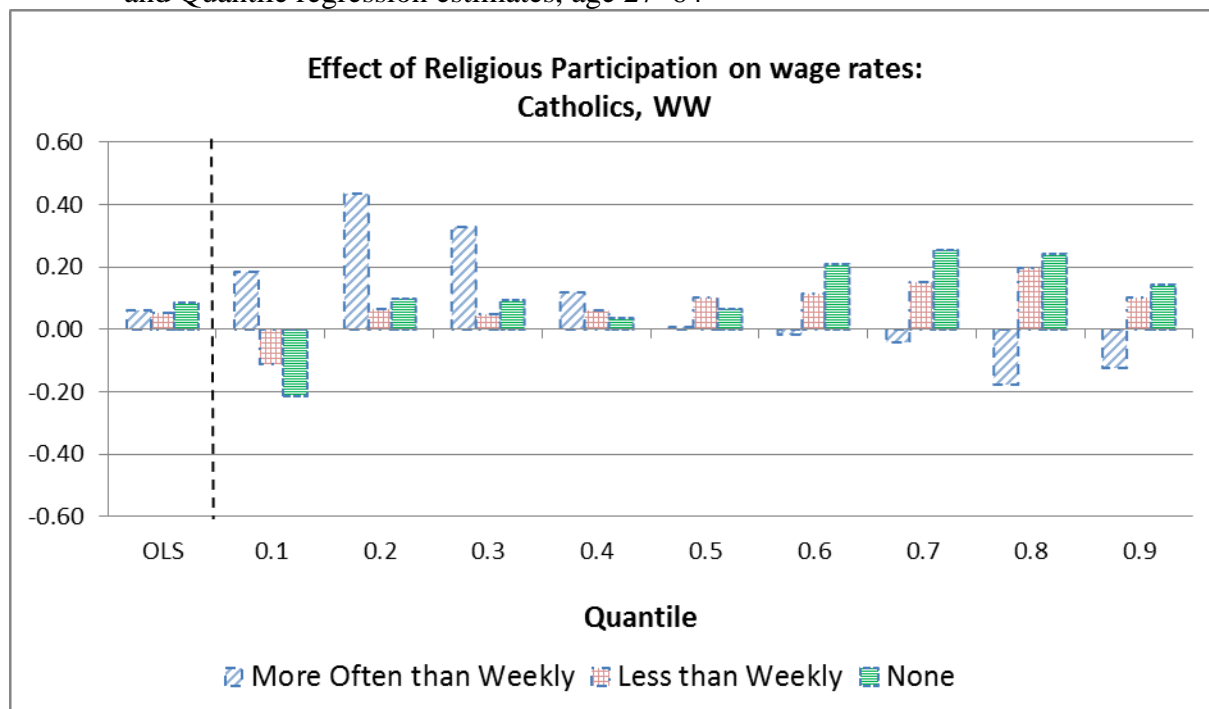WW, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Religious Attendance: Catholics										
Weekly Attendance (reference category)										
More often than weekly	0.06	0.18	0.43	0.33	0.12	0.01#	-0.02*	-0.04**	-0.18***	-0.12
	(0.20)	(1.15)	(0.41)	(0.31)	(0.19)	(0.18)	(0.18)	(0.16)	(0.29)	(0.46)
Less than weekly	0.05	-0.11	0.07	0.05	0.06	0.10	0.12	0.15	0.20	0.10
	(0.06)	(0.11)	(0.08)	(0.08)	(0.07)	(0.06)	(0.06)	(0.07)	(0.06)	(0.09)
None	0.09	-0.22	0.10	0.10	0.04	0.07	0.21**	0.25***	0.24***	0.15
	(0.07)	(0.17)	(0.10)	(0.08)	(0.07)	(0.09)	(0.09)	(0.08)	(0.06)	(0.13)
Control Variables										
Years of Schooling	0.12***	0.11***	0.11***	0.11***	0.10***	0.12***	0.13***	0.13***	0.13***	0.14***
	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Years of work experience	0.01**	0.01	0.01	0.00	0.01	0.01*	0.01***	0.01***	0.02***	0.01*
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
Region of Residence										
Northeast	0.12#	0.15	0.09	0.11	0.15*	0.18*	0.19*	0.09	0.15#	0.08
	(0.07)	(0.14)	(0.11)	(0.08)	(0.07)	(0.09)	(0.10)	(0.09)	(0.09)	(0.11)
North Central	0.10	0.13	0.11	0.03	0.17*	0.21**	0.21**	0.09	0.12	0.13
	(0.08)	(0.17)	(0.10)	(0.09)	(0.10)	(0.09)	(0.09)	(0.08)	(0.09)	(0.13)

TABLE XXV (continued)

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, CATHOLICS,
WW, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
West	0.20*	0.22	0.20	0.32**	0.28**	0.32***	0.24**	0.16#	0.16#	0.16
	(0.10)	(0.25)	(0.16)	(0.15)	(0.12)	(0.11)	(0.11)	(0.10)	(0.10)	(0.22)
Rural Area	-0.34#	-0.28	0.15	0.04	-0.24	-0.34*	-0.44**	-0.49*	-0.53	-0.71
	(0.22)	(1.90)	(0.73)	(0.45)	(0.40)	(0.19)	(0.20)	(0.26)	(0.52)	(1.26)
Constant	0.96	0.61	0.81	1.15	1.12	0.78	0.59	0.87	0.93	1.10
	(0.32)	(0.68)	(0.46)	(0.36)	(0.30)	(0.34)	(0.39)	(0.33)	(0.33)	(0.37)
Lambda	0.10***	-0.15	-0.24*	-0.45***	-0.04***	0.21**	0.34#	0.15***	0.25***	0.35***
	(0.26)	(0.55)	(0.40)	(0.29)	(0.27)	(0.30)	(0.27)	(0.26)	(0.24)	(0.29)
Adjusted R^2	0.16									
N	417									

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[e] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

9.3.2.2. **Non-Hispanic White Men (WM)**

Tables XXVI, XXVII and XXVIII and Figures 22, 23 and 24 show the regression estimates for non-Hispanic white males in the MP, CP and Catholic religious groups, respectively. Regression estimates based on the OLS and Quantile regression methodologies are presented and discussed.

Table XXVI and Figure 22 show the estimated effect of religious participation on wages for WM within the MP religious group. The OLS regression clearly shows that MP white men who attend religious services more often than weekly have a wage disadvantage of 27% (based on a coefficient estimate of negative 0.32) compared to MP white men who attend religious services on a weekly basis. Furthermore, the QR reveals that there is a more strongly negative effect of very high religious participation at low wages; it ranges from 56% at the lowest wage decile to 3% at the highest wage decile.[37]

Within religion effects of religious participation on wages for CP men are presented in Table XXVII and illustrated in Figure 23. The OLS estimates are not statistically significant and only a few of the QR estimates have marginal statistical significance. It appears that religious participation does not have an effect on wages for CP white men. As for CP women, this may be due in part to the fact that wages for CPs are not only low, they also have relatively low variance (see Table XIV).

Table XXVIII and Figure 24 present the within religion effect of religious participation on wages for Catholic white men. The non-linear effect of religious participation on wages is apparent and statistically significant across the wage rate distribution and is especially pronounced at low wages. Based on the OLS regression estimates, Catholic white men who

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[37] Percent effects are based on the coefficient estimates of -0.83 at the lowest to -0.03 at the highest wage rate decile.

attend religious services more often than weekly have a wage disadvantage of 22% (based on a coefficient estimate of negative 0.25), compared to Catholic men who attend religious services on a weekly basis. Catholic white men who never attend religious services have a 10% wage disadvantage, based on a coefficient estimate of negative 0.11, compared to Catholic men who attend religious services on a weekly basis. These patterns also hold along the wage rate distribution as shown by the Quantile regression estimates. The wage disadvantage of Catholic white men who attend religious services more often than weekly or who never attend religious services is apparent along the wage rates distribution as shown. However, for Catholic white men who attend religious services less often than weekly, the wage disadvantage seen at low wage rates disappears, and even becomes a wage premium at high wage rates.

Figure 22. Within religion effects of religious participation on wage rates, WM mainline Protestants, OLS and Quantile regression estimates, age 27–64

Effect of Religious Participation on wage rates: mainline Protestants, WM
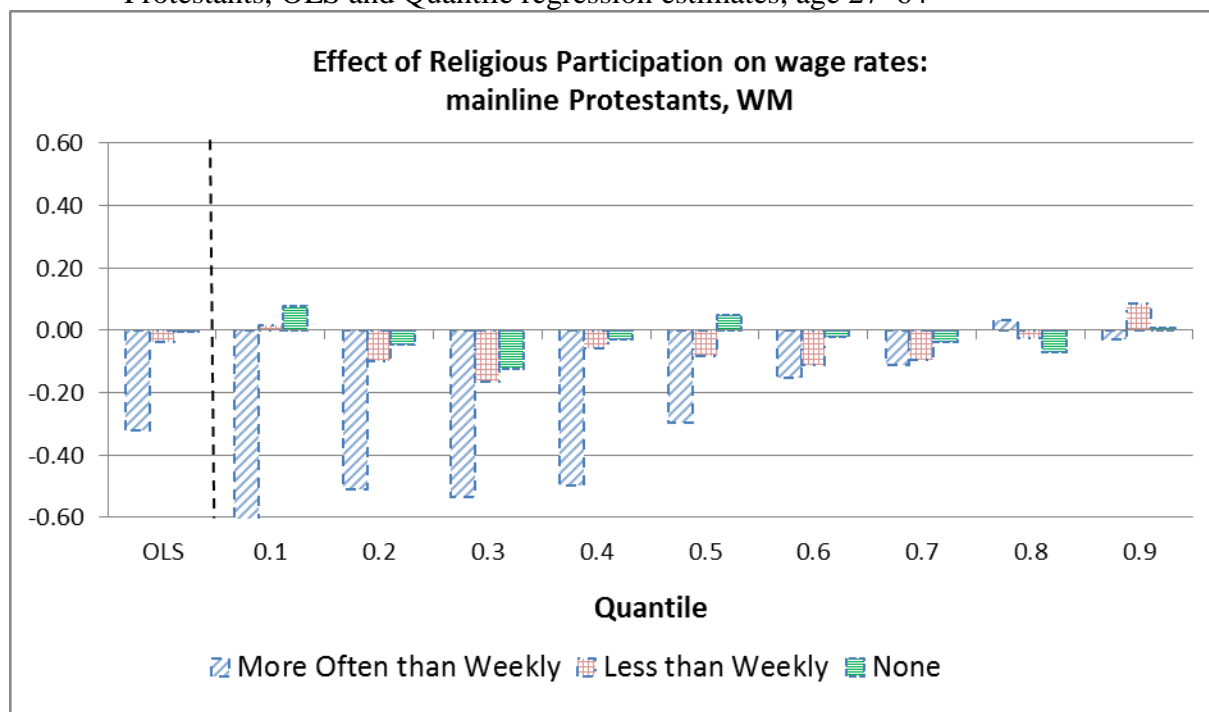
Figure 23. Within religion effects of religious participation on wage rates, WM conservative Protestants, OLS and quantile regression estimates, 27–64 years old

Effect of Religious Participation on wage rates: conservative Protestants, WM

Figure 24. Within religion effects of religious participation on wage rates, WM Catholics, OLS and quantile regression estimates, 27 – 64 years old

TABLE XXVI

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, MAINLINE PROTESTANTS, WM, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Religious Attendance: mainline Protestant										
Weekly Attendance (reference category)										
More often than weekly	-0.32**	-0.83	-0.51*	-0.53*	-0.50**	-0.30	-0.15	-0.11	0.03	-0.03
	(0.14)	(0.69)	(9)	(0.22)	(0.22)	(0.25)	(0.25)	(0.17)	(0.13)	(0.24)
Less than weekly	-0.04	0.02	-0.10	-0.16*	-0.06	-0.08	-0.11	-0.10	-0.02	0.09
	(0.07)	(0.18)	(0.11)	(0.09)	(0.08)	(0.06)	(0.09)	(0.08)	(0.08)	(0.10)
None	-0.001	0.08	-0.05	-0.12	-0.03	0.05	-0.02	-0.04	-0.07	0.01
	(0.10)	(0.25)	(11)	(0.13)	(0.12)	(0.09)	(0.13)	(0.12)	(0.11)	(0.13)
Control Variables										
Years of Schooling	0.11***	0.10***	0.09***	0.09***	0.11***	0.12***	0.13***	0.13***	0.13***	0.11***
	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Years of work experience	0.001	0.00	0.00	0.00	0.00	0.00*	0.00#	0.00	0.01	0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Region of Residence										
Northeast	0.09	-0.17	0.00	0.10	0.06	0.17	0.19#	0.14	0.08	0.06
	(0.09)	(0.19)	(0.13)	(0.11)	(0.12)	(0.09)	(0.13)	(0.12)	(0.10)	(0.12)
North Central	-0.16**	-0.48***	-0.16#	-0.16*	-0.06	-0.07	-0.01	-0.11	-0.20**	-0.19*
	(0.07)	(0.15)	(0.10)	(0.08)	(0.08)	(0.07)	(0.09)	(0.10)	(0.09)	(0.10)
West	-0.11	-0.36#	-0.21#	-0.20*	-0.08	-0.04	0.06	-0.04	-0.06	-0.22**
	(0.08)	(0.23)	(0.13)	(0.11)	(0.12)	(0.12)	(0.13)	(0.14)	(0.10)	(0.10)

TABLE XXVI (continued)

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, MAINLINE PROTESTANTS, WM, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Rural Area	-0.26***	-0.57*	-0.37#	-0.34*	-0.21#	-0.21*	-0.17	-0.21*	-0.10	-0.21
	(0.11)	(0.33)	(0.24)	(0.18)	(0.14)	(0.11)	(0.12)	(0.12)	(0.14)	(0.15)
Constant	1.66***	1.45***	1.76***	1.85***	1.56***	1.48***	1.40***	1.58***	1.74***	2.12***
	(0.22)	(0.50)	(0.35)	(0.26)	(0.24)	(0.24)	(0.29)	(0.32)	(0.23)	(0.26)
Lambda	-0.54#	-1.52***	-1.33***	-0.89*	-0.57	-0.66	-0.22	-0.01	0.44	0.51
	(0.36)	(0.60)	(0.53)	(0.51)	(0.57)	(0.52)	(0.47)	(0.53)	(0.45)	(0.47)
Adjusted R^2	0.16									
N	450									

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[e] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXVII

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, CONSERVATIVE PROTESTANTS, WM, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

| Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Religious Attendance: conservative Protestant										
Weekly Attendance (reference category)										
More often than weekly	0.01	-0.03	0.06	0.14*	0.07	-0.05	-0.12#	-0.10	-0.09	-0.06
	(0.07)	(0.15)	(0.12)	(0.08)	(0.07)	(0.07)	(0.08)	(0.08)	(0.08)	(0.14)
Less than weekly	-0.08	-0.12	-0.13*	-0.04	-0.05	-0.02	-0.09	-0.13*	-0.12*	-0.04
	(0.06)	(0.13)	(0.07)	(0.08)	(0.08)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)
None	-0.05	0.01	-0.02	0.05	0.03	-0.04	-0.02	-0.10	-0.06	0.05
	(0.07)	(0.17)	(0.09)	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.09)
Control Variables										
Years of Schooling	0.06***	0.05*	0.05***	0.05***	0.06***	0.06***	0.07***	0.07***	0.08***	0.09***
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Years of work experience	0.01***	0.01	0.01*	0.00#	0.01#	0.00*	0.01**	0.01**	0.00*	0.01**
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Region of Residence										
Northeast	-0.19*	-0.29	-0.22#	-0.19	-0.19	-0.27**	-0.19#	-0.13	-0.13	-0.26
	(0.10)	(0.29)	(0.14)	(0.13)	(0.14)	(0.12)	(0.12)	(0.11)	(0.15)	(0.22)
North Central	-0.12**	-0.16	-0.13*	-0.16***	-0.13*	-0.09	-0.13**	-0.07	-0.02	-0.07
	(0.05)	(0.11)	(0.07)	(0.06)	(0.06)	(0.07)	(0.06)	(0.06)	(0.05)	(0.08)
West	0.02	-0.13	-0.05	0.05	0.03	0.03	0.01	0.02	0.19	0.22*
	(0.06)	(0.15)	(0.12)	(0.09)	(0.08)	(0.08)	(0.07)	(0.09)	(0.12)	(0.11)

TABLE XXVII (continued)

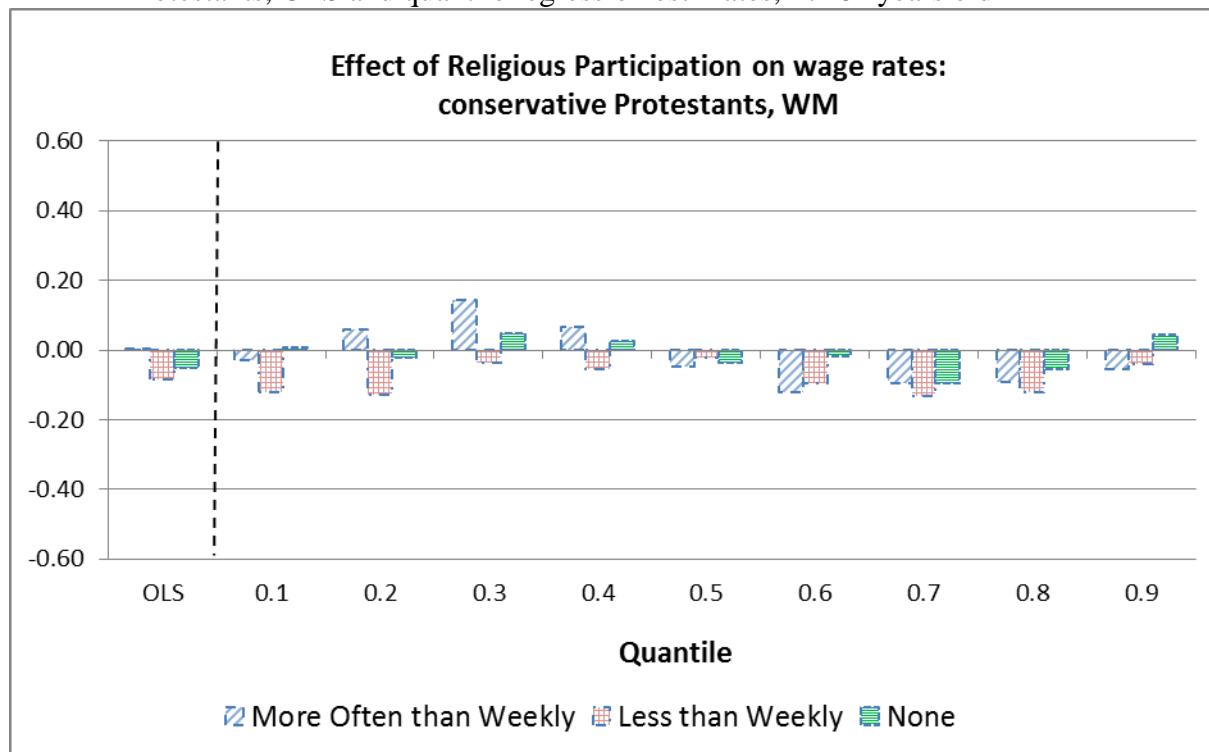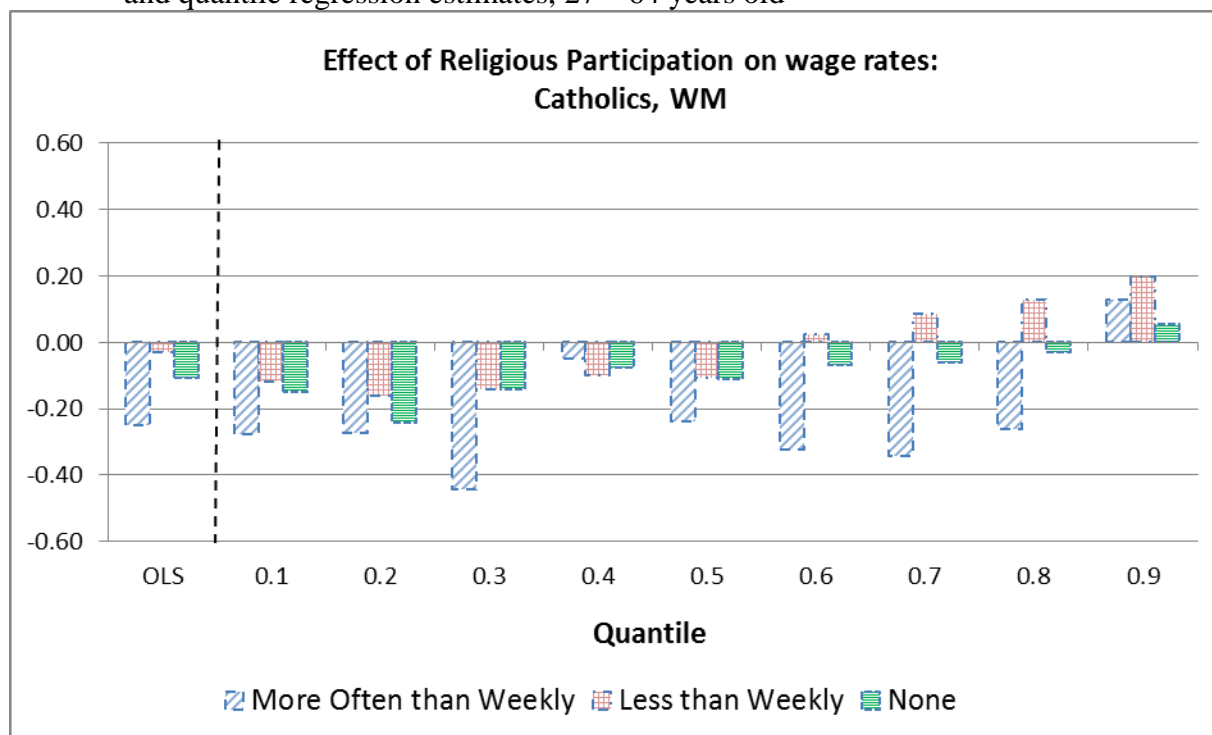WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, CONSERVATIVE PROTESTANTS, WM, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Rural Area	-0.05	-0.13	-0.11	-0.05	-0.09	-0.17#	-0.15	-0.06	-0.06	0.33#
	(0.10)	(0.23)	(0.12)	(0.14)	(0.10)	(0.11)	(0.14)	(0.19)	(0.22)	(0.20)
Constant	2.36***	2.01***	2.18***	2.28***	2.34***	2.47***	2.41***	2.40***	2.40***	2.41***
	(0.19)	(0.35)	(0.25)	(0.20)	(0.23)	(0.21)	(0.20)	(0.26)	(0.23)	(0.26)
Lambda	-0.81***	-0.98**	-1.08***	-1.19***	-1.12***	-1.02***	-0.80***	-0.54*	-0.51**	-0.81***
	(0.21)	(0.46)	(0.29)	(0.32)	(0.32)	(0.27)	(0.28)	(0.31)	(0.25)	(0.22)
Adjusted R^2	0.13									
N	527									

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[e] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXVIII

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, CATHOLICS, WM, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	*Quantile*								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Religious Attendance: Catholics										
Weekly Attendance (reference category)										
More often than weekly	-0.25*	-0.28	-0.27	-0.44#	-0.05	-0.24	-0.32**	-0.34**	-0.26	0.13
	(0.14)	(0.66)	(0.40)	(0.29)	(0.26)	(0.19)	(0.15)	(0.17)	(0.26)	(0.47)
Less than weekly	-0.03	-0.12	-0.16**	-0.14**	-0.10*	-0.11#	0.03	0.09*	0.13**	0.20***
	(0.05)	(0.08)	(0.07)	(0.06)	(0.06)	(0.07)	(0.05)	(0.05)	(0.05)	(0.07)
None	-0.11#	-0.15	-0.24***	-0.14#	-0.08	-0.11#	-0.07	-0.06	-0.03	0.05
	(0.06)	(0.11)	(0.0824)	(0.09)	(0.07)	(0.07)	(0.05)	(0.05)	(0.08)	(0.09)
Control Variables										
Years of Schooling	0.10***	0.08***	0.10***	0.09***	0.13***	0.13***	0.12***	0.11***	0.10***	0.14***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Years of work experience	0.01	0.00	0.00	0.00	0.00	0.00	0.01**	0.01***	0.02***	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Region of Residence										
Northeast	0.07	0.15	0.06	0.02	0.02	0.03	0.05	0.02	-0.12	0.14
	(0.08)	(0.14)	(0.11)	(0.11)	(0.11)	(0.09)	(0.10)	(0.09)	(0.10)	(0.11)
North Central	0.04	0.00	-0.05	0.05	0.02	0.04	0.10	0.05	-0.08	-0.01
	(0.07)	(0.13)	(0.10)	(0.09)	(0.09)	(0.07)	(0.07)	(0.06)	(0.08)	(0.09)

TABLE XXVIII (continued)

WITHIN RELIGION EFFECTS OF RELIGIOUS PARTICIPATION ON WAGE RATES, CATHOLICS,
WM, OLS AND QUANTILE REGRESSION RESULTS, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f, g]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
West	0.19**	0.25*	0.15	0.15#	0.10	0.15*	0.18*	0.13#	-0.02	0.15
	(0.08)	(0.13)	(0.10)	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.09)	(0.10)
Rural Area	-0.28#	-0.44	-0.52**	-0.68	-0.27	-0.30	-0.40*	-0.38	-0.41	-0.11
	(0.18)	(0.75)	(0.43)	(0.34)	(0.33)	(0.28)	(0.23)	(0.33)	(0.44)	(0.70)
Constant	1.72***	1.39**	1.36***	1.78***	1.29***	1.39***	1.68***	1.88***	2.34***	1.49***
	(0.31)	(0.59)	(0.40)	(0.40)	(0.39)	(0.36)	(0.31)	(0.31)	(0.38)	(0.50)
Lambda	-0.43	0.17	0.41	-0.62	0.04	-0.22	-1.00#	-1.34**	-1.64**	0.17
	(0.57)	(0.81)	(0.78)	(0.87)	(0.67)	(0.75)	(0.64)	(0.67)	(0.80)	(0.82)
Adjusted R^2	0.18									
N	515									

[a] Dependent variable is natural logarithm of wage rate.

[b] Unstandardized coefficients are reported.

[c] Standard errors are in parentheses.

[d] Quantile regression standard errors are computed using bootstrap method with 200 reiterations.

[e] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[f] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[g] Source: PSID, 2005 survey year; religious participation is as of 2003.

9.4. <u>**Discussion: Within Religion Gender Differences**</u>

The effect of religious participation on wages for MPs appears to be somewhat different between men and women. The adverse effect of very high participation in religious services is apparent for both men and women—i.e., both men and women affiliated with the MP religion who attend religious services more often than weekly have a wage disadvantage compared to those who attend religious services on a weekly basis. This non-linear effect is evident across the wage rate distribution and especially at low wages. However, the effect of not attending religious services is different between men and women. While MP women who do not attend religious services have a wage disadvantage, significant effects associated with non-attendance could not be discerned for men.

Religious participation does not seem to influence wages for CP men or women. This may be due in part to the fact that the variance of wages for this religious group is relatively small for both gender groups (see Table XIV).

The biggest difference by gender in the effect of religious participation on wages is in the case of Catholics. Catholic men who attend religious services more often than weekly or less often than weekly have a wage disadvantage compared to Catholic men who attend religious services on a weekly basis. For Catholic women, the adverse effect on wages at very high participation in religious services is apparent at high wages although at the mean the OLS estimate is not statistically significant. Lapsed Catholic women who do not attend religious services at all have a wage premium that is especially pronounced at high wages. This result may be a reflection of the strong family focus of Catholics (Tropman, 2002) which can depress wages, and which is likely not relevant to Catholic women who do not attend religious services.

In addition, patterns of lower fertility rates (Keister, 2011, Chapter 2) and higher

education (Keister, 2011, p. 43) may be positively affecting wage rates especially for those

Catholic women who are at the upper end of the wage distribution. These patterns of economic

and demographic characteristics combined with lower religious attendance patterns (Pew

Research Center, 2009) of Catholics may be a basis to hypothesize that the overall upward

mobility of Catholics in recent years documented by Keister (2011, p. 138) may be largely

driven by Catholic women who do not attend religious services.[38] Further research examining

differences between individuals within the Catholic religious group is needed.

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[38] Keister (2007) reports an overall upward mobility for Catholics. She does not examine the effects on wealth at various religious participation levels. Further research is needed to examine various levels of religious participation on socioeconomic outcomes.

10. CONCLUDING REMARKS

10.1. Discussion

10.1.1. Conclusions and Contributions

Previous studies have shown that an individual's religious affiliation is associated with a number of socioeconomic outcomes including educational attainment and wages. This thesis studied three main relationships: (1) between religious affiliation and wages, (2) between religious affiliation and returns to education, and (3) between levels of religious participation and wages, within religious affiliations. While previous studies have examined Relationship (1) for non-Hispanic white women (WW) age 27–44, this thesis expanded on that previous work to include non-Hispanic white men (WM) as well—to better understand the complex interplay between religion and gender. In addition, this thesis examined a wider range age group, age 27–64 than has previously been studied. Relationship (2) has been examined before in the context of measuring the supply and demand forces that influence educational attainment. This thesis examined this relationship with more recent data. Relationship (3) has been examined in previous studies with religious participation being specified as a dichotomous variable, which did not properly capture the wide range of participation rates. This study specified the religious participation variable allowing for detection of non-linear effects; thus providing information on the differing effects of low and high levels of religious participation. Finally, in addition to the Ordinary Least Squares (OLS) analysis, which has been used in the past for examining these relationships, for the first time this thesis also employed a Quantile regression (QR) approach to examine wage differentials, returns to education, and within religion differences of the religious participation–wages relationship along the wage rate distribution.

With regard to the relationship between religious affiliation and wages, this thesis first replicated previous analyses for WW using a newer dataset, and concluded that previous findings in terms of wage differentials between religious groups for WW still hold using the newer dataset. Specifically, based on OLS regressions, mainline Protestants (MPs) and Catholics are at the center of the wage rate distribution; Jews earn higher wages; and conservative Protestants (CPs), Mormons and the no religion group earn lower wages among WW in both datasets.

Using the newer dataset, this study then analyzed wage differentials between religious groups for WM. Similar patterns as those for WW were found for WM except in the case of Mormons. While Mormon women have a wage disadvantage of 24%, Mormon men have a wage premium of 27% compared to their MP counterparts. Based on the findings of previous studies, along with the history and the teachings of the Mormon religion, the opposite effect of Mormonism on female wages versus male wages may be explained by several factors. On the one hand, the low employment levels of Mormon women (Heaton and Cornwall, 1989) and their tendency to work part time have a negative impact on their on-the-job training. This leads to a detrimental effect on wages, as on-the-job training is an important determinant of wages (Becker, 1985; Mincer, 1974). On the other hand, the wages of Mormon men are positively affected directly through the encouragement of the financial success of men by the Mormon Church (Winter, 2012). While a downward pressure of female wages is also apparent for other conservative religions such as the CP religion, a direct positive effect on wages for CP men is not present. On the contrary, there may be a negative effect on wages of CP men through their occupational choices (Keister, 2011; Sherkat, 2012) and disadvantaged social networks (Massengill, 2008; Sherkat, 2010).

Differences in returns to education by religious affiliation were estimated for WW and WM. For WW, differences in returns to education are not statistically significant between MP, CP and Catholic women. CP men, however, have lower returns to education than do their MP and Catholic male counterparts. This effect may be due in part to the tendency of CP denominations to oppose critical thinking and the scientific method (Darnell and Sherkat, 1997; Sherkat and Darnell, 1999), which may decrease the productivity of formal schooling. In addition, CP men may be likely to choose occupations (Keister, 2011; Sherkat, 2012) outside of sciences that generally pay lower wages (Darnell and Sherkat, 1997).

Within a given religious affiliation, levels of participation vary widely: from attending services more than once per week, to rarely or never participating in religious activities at all. This thesis examined within religion effects of religious participation on wage rates for MPs, CPs and Catholics, and also provided comparative analyses by gender. The religious participation dimension of religion was found to have a marked association with wage rates. An adverse effect of very high religious participation (more often than weekly) was found for MPs, both men and women, and for Catholic men, consistent with earlier results in the literature for Jewish men (Chiswick and Huang, 2008). The frequency of participation in religious services was found to have no effect on wages for CPs of either gender, possibly reflecting a low variance of wages among CPs. Catholic women stood out with a very different association between the frequency of their participation in religious services and their wages: lapsed Catholic women who did not attend religious services at all, but identified themselves as Catholic only nominally, were seen to have a wage premium.

Finally, the QR approach was used to estimate wage differentials between religious groups, returns to education, and within religion effects of religious participation across the wage

rate distribution. Wage rate differentials along the wage rate distribution were estimated for MPs, CPs, Catholics and Jews. Generally, the QR estimates were consistent with the OLS estimates and there was little variation along the wage rate distribution; however, there were notable exceptions within each gender group. In the case of WW, the OLS regression showed that the Catholic effect on wage rates was not significantly different from the MP effect, but the estimates based on the QR methodology indicated that Catholic women have a wage premium at high wages. Furthermore, the QR analysis of within religion effects of religious participation on wages revealed that the wage advantage of lapsed Catholic women is especially pronounced at high wages. These findings suggest the hypothesis that the recent upward mobility of Catholic women reported by Keister (2011) is likely driven mainly by lapsed Catholic women. Further research that examines this group more fully would be desirable.

In the case of WM, the QR estimates enriched the results with the finding that CP men have a larger wage disadvantage at high wages. These findings suggest that factors that have a negative influence on wages of CPs such as the choice of occupation, typically at the lower rungs of the occupational structure (Keister, 2011, p. 65; Sherkat, 2012) and outside of sciences (Darnell and Sherkat, 1997), may be more important at high wages. The greater earnings gap between more and less educated individuals later in life (Ehrenberg & Smith, 1997) may be a contributing factor; in addition, CP men may be in occupations that have different earning trajectories.

The QR approach also showed that rates of return to education for MP and CP women appear to be fairly uniform along the wage rate distribution while rates of return for MP and CP men are relatively low at low wages and increase as wages increase.

10.1.2. <u>Limitations</u>

This study was not able to overcome the concern of possible two-way causality. Religious participation and wages may be mutually determined, as wage rates influence the perceived costs of attending religious services. High wage individuals will place a high value on their time, and their opportunity cost in terms of forgone earnings will be higher if they choose to devote more time to religious activities instead of labor market activities. These high wage individuals may choose to attend religious services less frequently. Therefore, if religious participation is measured at the time of the survey, contemporaneously with wages, two-way causality is a concern (Lehrer, 2010). Ideally, to address problems of endogeneity, a researcher would use Instrumental Variable (IV) methods or estimate simultaneous equations models. Unfortunately, the PSID data does not contain variables that could serve as potential instruments, such as density of churches from a particular religion in the geographical area where an individual lives. The religion variables from the PSID data used in this thesis were measured two years prior to the survey for all respondents, and this diminishes endogeneity problem; however, it does not eliminate it. The results presented in this thesis should thus be interpreted as descriptive rather than causal.

Another limitation of the analysis in this thesis is the heterogeneity within the religious categories analyzed. CP and MP religious affiliations are comprised of a number of smaller religious denominations. The teachings of various religious denominations classified as CPs or MPs may differ, and therefore the indirect and the direct effects on wages may be different. For example, Baptists and Amish are classified as CPs but the teachings of these two denominations likely have different effect on wages. Similarly, within the Jewish category, the teachings of

Orthodox and Reform Judaism are very different. Ideally, future studies with large data sets will be able to examine more narrowly defined religious groups.

10.1.3. <u>Qualifications</u>

Historically, researchers have often asked whether religion is good for us (Gruber, 2005) and it is natural for a society to frequently ask this question. It is important to note that, in the analyses in this thesis, a wage premium is not meant to be "good" and a wage disadvantage is not meant to be "bad". Some religions may encourage individuals to spend more time taking care of their families; therefore, for individuals who follow the practices of such religion, the time spent with their families would come at the expense of spending time in the labor market—which in turn may result in lower wages and lower wealth accumulation. A lower wage may thus not necessarily be undesirable in the context of an individual's perceived costs and benefits based on their religious values. The goal of this thesis is to describe the association of religious affiliation and participation with wages, and does not attempt to classify positive effects on wages as "good" and negative effects as "bad."

10.2.   <u>Contributions to the Broader Field of Labor Economics</u>

One of the key goals of the broader labor economics field is to understand differences among individuals in educational attainment and wages. Religion is an important part of life for many Americans and it has been shown to influence many socioeconomic and demographic outcomes including wages and educational outcomes. Through its effect on these outcomes, religion shapes our society and plays an important part in influencing individuals' well-being. This thesis contributes to the broader field of labor economics by shedding light on differences in labor market outcomes influenced by religion.

The male–female wage gap is an area of research that often guides labor market policy decisions in the U.S.. With few exceptions (Fortin 2005; Glass & Nath 2006), the role religion may play in explaining the gender wage gap has generally not been taken into consideration. The findings from this thesis may contribute to policy-related research studies by emphasizing the importance of including religion in analyses of male–female wage differentials.

Wage differentials are typically explained as a function of differences in socioeconomic and demographic variables such as an individual's education, parents' education, gender, race, marital status and residence. As discussed in previous sections, there are also behavioral differences between religious groups that can indirectly affect wage rates, as well as specific teachings of each religion that may directly affect wages. For example, CP women spend more time in household activities influenced by their religion (Ellison and Bartkowski, 2002), and this may negatively affect their wages. In addition, they may choose less demanding occupations (Glass & Nath, 2006) that generally pay less. Similarly, Mormonism was found to have a negative effect on wages among women, which may be due in part to the pronatalist nature of the Mormon religion. Similar effects are likely present for other religiously conservative groups such as Muslims.

Another area of concern in labor economics is the growing income and wealth inequality in the U.S.. Keister (2011, Chapter 6) found that CPs have low levels of wealth compared to MPs and that they accumulate wealth at markedly slower rates. The findings in this thesis indicate that differences in wages between religious groups are likely a major factor behind wealth differentials by religion.

10.3. <u>**Directions for Future Research**</u>

Religious participation is a dimension of religion that has generally been specified as a continuous or as a dichotomous (high vs. low religious attendance) variable in previous studies (Lehrer, 2010; Ellison et al. 2011; Fitzgerald and Glass 2012). The findings in this thesis and other studies that have allowed for non-linearity (Chiswick and Huang, 2008; Lehrer et al., 2009; Lehrer and Chen, 2012) suggest the importance of a more refined specification of religious participation. Future research studies need to ensure that religious participation is specified in a manner that allows the detection of non-linear effects.

Previous research has shown that non-Hispanic Catholics are moving upward on the wealth scale partly due to improvement in education and work behaviors (Keister, 2011, p.146). The findings in this study suggest that lapsed Catholic women have a wage premium relative to their counterparts with weekly attendance at religious services. Furthermore, as evidenced by the QR estimates, this advantage is especially pronounced at high wages. This suggests that lapsed Catholic women may disproportionately include individuals with unobserved characteristics associated with high wages. Are lapsed Catholic women driving the upward mobility of this religious group? What are the characteristics that help them achieve higher wages? Further studies with other data sets would be useful to ascertain if these findings are confirmed.

Mormons have unfortunately been a small sample in most data sets, and previous studies generally have not studied this religious affiliation. However, this study found statistically significant gender differences in the effect of Mormonism on wage rates; while Mormon women have a wage disadvantage relative to their MP counterparts, Mormon men have a wage premium. These differences may be explained by two main forces: the pronatalist nature of the Mormon

religion, which depresses female wages; and its tendency to view spiritual and material achievements as being the same, which contributes to higher wages of Mormon men. It would be useful to study the case of Mormons in future research to see if these results are supported.

The *no religion* group is diverse, comprised of agnostics, atheists, and people who do not belong to any religious group (Roof, 1999; Massengill and MacGregor, 2012). Consistent with its diverse nature, previous studies have reported mixed results. Some studies have reported relatively low wages (Lehrer, 2010) and low educational attainment (Keysar and Kosmin, 1995; Glass and Jacobs, 2005; Lehrer, 2010) while other studies have found that a high percentage of academics, who obviously have high education, are not religiously affiliated (Stark et al., 1996; Iannaccone, 1998; Stark and Finke, 2000). The highly educated individuals who are not affiliated with any religion are a relatively small fraction of this group, and results from regression analyses are dominated by religiously unaffiliated individuals with low education. The no religion group has been growing rapidly in recent decades (Putnam and Campbell, 2010) and a better understanding of the influence of non-affiliation on wages and other socioeconomic outcomes is important. Future studies need to permit separation of atheists, agnostics and "nothing in particular" who may be different in their individual and demographic characteristics as well as their attitudes, with different implications for wage rates and other socioeconomic outcomes.

Studies that have examined the returns to education have generally used family background variables as controls (Card, 1999, p. 1842), and the focus has been on estimation of mean rates of return. Only a few previous studies have examined differences in returns to education by religious group (Chiswick, 1988; Lehrer, 1999). This thesis found that CP white men have lower returns to education than their MP counterparts (Chapter 8), but only if older

individuals are included in the analyses; i.e., when the sample was restricted to the younger

cohort, individuals between the ages of 27 and 44, the returns to education between CP and MP

men were not statistically different. Further research is needed to examine other factors that

influence the returns to education in addition to the standard family background variables; i.e., to

explore why age and cohort make a difference in returns to education for CP men.

Previous studies have also found that CPs continue to have a wage disadvantage in spite

of the increase of their educational attainment as discussed by Keister (2011); this finding was

confirmed by this thesis. CPs also hold much lower wealth than their MP counterparts. Median

household net worth of CPs was reported at $86,600 compared to $150,500 for their MP

counterparts (Keister, 2011, p.86).[39] It would be useful for future studies to examine the

dynamics of socioeconomic outcomes of the CP affiliation. For example, it would be desirable

to confirm whether the educational attainment of CPs has been increasing in recent years, and if

so, if there are any sub-groups within CPs that are attaining higher educational levels. In

addition, further examination is needed of the pathways through which CPs accumulate lower

wealth levels. The results in this thesis suggest that the low wages of CP men and women are

likely an important contributing factor. Further research along these lines has the potential to

make major contributions to the field of Labor Economics.

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[39] Statistics were based on data from 1979-2004 NLSY survey and the individual's religion is measured in 2000.

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APPENDIX A

The probit regression estimates for both non-Hispanic white women (WW) and non-Hispanic white men (WM) are presented in this appendix. TABLE XXIX presents the probit regression results for WW and TABLE XXX presents the probit regression results for WM. The probit regressions are estimated to correct for sample selection bias prior to estimating the wage equation. The dependent variable is dichotomous, coded one for employed and zero for unemployed. Independent variables include all independent variables included in the wage equation as well as other variables that may influence the probability of employment. The following additional control variables were included: number of children, child under five years old, marital status[40] and other family income.

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[40] In the PSID, cohabiting opposite-sex couples are treated like married couples except the first wave they appear in the study, where they are labeled as either the boyfriend or girlfriend of the head. The "married" category therefore includes long-term cohabiting partners. However, the PSID does not allow identification of the same-sex cohabiting couples.

TABLE XXIX

LABOR FORCE PARTICIPATION: PROBIT REGRESSION,
WW, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e]

Variable	Estimate	Standard Error
Religion Variables		
Mainline Protestant (Reference Category)		
Conservative Protestant	0.09	(0.08)
Catholic	0.08	(0.08)
Jews	0.20	(0.19)
Mormon	-0.33#	(0.22)
No religion	0.09	(0.09)
Control Variables		
Years of Schooling	0.09***	(0.01)
Years of work experience	0.01**	(0.00)
Region of Residence		
Northeast	0.12	(0.09)
North Central	0.26	(0.07)
West	0.03	(0.08)
Rural area	-0.13	(0.13)
Other control variables		
Number of Children	-0.05*	(0.03)
Child under 5	-0.29***	(0.08)
Married	-0.37***	(0.13)
Divorced/Separated	-0.14	(0.14)
Widowed	-0.74***	(0.22)
Constant	0.00***	(0.00)
Log Likelihood	-1413	
N	2,372	

[a] Dependent variable is dichotomous with values employed or unemployed.

[b] Standard errors are in parentheses.

[c] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[d] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.

[e] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXX

LABOR FORCE PARTICIPATION: PROBIT REGRESSION,
WM, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e]

Variable	Estimate	Standard Error
Religion Variables		
Mainline Protestant (Reference Category)		
Conservative Protestant	0.01	(0.10)
Catholic	0.04	(0.10)
Jews	-0.15	(0.22)
Mormon	-0.28	(0.25)
No religion	0.12	(0.11)
Control Variables		
Years of Schooling	0.05***	(0.02)
Years of work experience	0.01***	(0.00)
Region of Residence		
Northeast	0.17#	(0.11)
North Central	0.07	(0.09)
West	0.03	(0.10)
Rural area	0.04	(0.16)
Other control variables		
Number of Children	0.11***	(0.04)
Child under 5	-0.04	(0.10)
Married	0.25**	(0.13)
Divorced/Separated	-0.04	(0.15)
Widowed	-0.36	(0.34)
Constant	0.00***	(0.00)
Log Likelihood	-920	
N	2,364	

[a] Dependent variable is dichotomous with values employed or unemployed.

[b] Standard errors are in parentheses.

[c] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.

[d] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively

[e] Source: PSID, 2005 survey year; religious participation is as of 2003.

APPENDIX B

This appendix includes the full regression results from the models presented in Chapter 8. The full regressions examining returns to education for non-Hispanic white women (WW) are shown in the first three tables and the full regressions for non-Hispanic white men (WM) are shown in the next three tables. Tables XXXI, XXXII and XXXIII show the full regressions for MP, CP and Catholic women, respectively. Tables XXXIV, XXXV and XXXVI show the full regressions for MP, CP and Catholic men, respectively.

TABLE XXXI

RETURNS TO EDUCATION, OLS AND QUANTILE REGRESSION ESTIMATES, MAINLINE PROTESTANTS,
WW, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Education	0.130***	0.109***	0.12***	0.148***	0.149***	0.143***	0.137***	0.149***	0.134***	0.117***
	(0.018)	(0.038)	(0.024)	(0.019)	(0.019)	(0.017)	(0.017)	(0.029)	(0.032)	(0.019)
Years of work experience	0.01***	0.01	0.01	0.01*	0.01***	0.01***	0.01***	0.01**	0.01**	0.01
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Other Control Variables										
Northeast	0.28***	0.12	0.15	0.29**	0.23*	0.27**	0.31***	0.33***	0.26**	0.30#
	(0.09)	(0.18)	(0.17)	(0.14)	(0.11)	(0.12)	(0.10)	(0.09)	(0.12)	(0.18)
North Central	0.15*	(0.05)	0.04	0.19	0.18*	0.18*	0.15*	0.24***	0.17	0.19
	(0.08)	(0.16)	(0.12)	(0.14)	(0.09)	(0.09)	(0.08)	(0.07)	(0.13)	(0.16)
West	0.15#	0.05	0.17	0.16	0.10	0.16#	0.15	0.21**	0.09	0.18
	(0.09)	(0.24)	(0.18)	(0.12)	(0.09)	(0.1))	(0.11)	(0.09)	(0.13)	(0.21)
Rural Area	-0.41***	-0.34	-0.23	-0.36*	-0.33**	-0.41***	-0.39***	-0.47***	-0.41***	-0.49**
	(0.11)	(0.30)	(0.24)	(0.19)	(0.12)	(0.13)	(0.14)	(0.16)	(0.13)	(0.23)
Constant	0.41	0.39	0.48	(0.11)	0.03	0.32	0.58	0.23	0.63	1.23*
	(0.40)	(0.84)	(0.53)	(0.53)	(0.41)	(0.44)	(0.40)	(0.38)	(0.66)	(0.74)
Lambda	0.71***	0.34	0.16	0.72#	0.70*	0.54*	0.47#	0.98***	1.00***	0.64
	(0.27)	(0.55)	(0.46)	(0.45)	(0.36)	(0.30)	(0.32)	(0.28)	(0.39)	(0.58)
Adjusted R^2	0.17									
N	378									

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

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TABLE XXXII

RETURNS TO EDUCATION, OLS AND QUANTILE REGRESSION ESTIMATES, CONSERVATIVE PROTESTANTS, WW, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Education	0.129***	0.148***	0.152***	0.150***	0.147***	0.140***	0.143***	0.149***	0.099***	0.15***
	(0.020)	(0.042)	(0.029)	(0.026)	(0.025)	(0.023)	(0.021)	(0.023)	(0.022)	(0.029)
Years of work experience	0.01***	0.02#	0.01	0.01	0.01	0.01	0.01***	0.01*	0.01#	0.01*
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Other Control Variables										
Northeast	0.21*	0.36#	0.12	0.24	0.21	0.24*	0.23**	0.30***	0.17#	0.05
	(0.12)	(0.23)	(0.15)	(0.17)	(0.17)	(0.14)	(0.10)	(0.09)	(0.11)	(0.34)
North Central	-0.06	0.00	-0.01	0.02	-0.08	-0.08	-0.09#	-0.07	-0.11*	-0.03
	(0.06)	(0.15)	(0.11)	(0.06)	(0.06)	(0.06)	(0.05)	(0.07)	(0.06)	(0.13)
West	0.05	-0.06	0.11	0.12	0.01	0.03	0.15*	0.13	0.06	0.18
	(0.07)	(0.23)	(0.14)	(0.08)	(0.08)	(0.10)	(0.09)	(0.08)	(0.09)	(0.20)
Rural Area	-0.36***	-0.80	-0.51#	-0.54**	-0.60**	-0.50#	-0.12	-0.18	-0.23	-0.11
	(0.13)	(0.64)	(0.33)	(0.28)	(0.30)	(0.31)	(0.24)	(0.17)	(0.22)	(0.27)
Constant	0.54**	-0.46	-0.30	-0.10	0.12	0.42	0.50	0.56	1.64***	0.93*
	(0.37)	(0.78)	(0.51)	(0.46)	(0.48)	(0.46)	(0.41)	(0.46)	(0.46)	(0.55)
Lambda	0.49**	0.49	0.81***	0.85***	0.77***	0.59**	0.55**	0.45#	0.05	0.40
	(0.22)	(0.40)	(0.26)	(0.25)	(0.27)	(0.27)	(0.24)	(0.28)	(0.32)	(0.34)
Adjusted R^2	0.13									
N	445									

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXXIII

RETURNS TO EDUCATION, OLS AND QUANTILE REGRESSION ESTIMATES, CATHOLICS,
WW, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Education	0.115***	0.12***	0.108***	0.098***	0.105***	0.115***	0.124***	0.119***	0.134***	0.150***
	(0.014)	(0.033)	(0.021)	(0.019)	(0.014)	(0.013)	(0.018)	(0.016)	(0.018)	(0.019)
Years of work experience	0.01***	0.02	0.01	0.01	0.01	0.01**	0.01***	0.01***	0.01**	0.01**
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Other Control Variables										
Northeast	0.12	0.08	0.09	0.10	0.13*	0.15*	0.15	0.08	0.15#	0.08
	(0.08)	(0.14)	(0.13)	(0.10)	(0.06)	(0.08)	(0.11)	(0.09)	(0.09)	(0.11)
North Central	0.10	0.03	0.07	0.02	0.12	0.18**	0.20*	0.04	0.10	0.03
	(0.08)	(0.18)	(0.12)	(0.10)	(0.09)	(0.08)	(0.10)	(0.08)	(0.09)	(0.12)
West	0.21**	0.36	0.23#	0.25#	0.28***	0.29***	0.28**	0.12	0.24*	0.18
	(0.10)	(0.26)	(0.15)	(0.16)	(0.11)	(0.11)	(0.11)	(0.12)	(0.12)	(0.19)
Rural Area	-0.35#	-0.41	0.13	-0.02	-0.24	-0.37**	-0.41#	-0.49	-0.40	-0.66
	(0.22)	(1.50)	(0.65)	(0.52)	(0.33)	(0.18)	(0.26)	(0.36)	(0.54)	(1.12)
Constant	1.01***	0.65	0.95**	1.37***	1.13***	0.88**	0.90**	1.16***	1.16***	1.05***
	(0.31)	(0.72)	(0.48)	(0.40)	(0.29)	(0.30)	(0.38)	(0.35)	(0.35)	(0.39)
Lambda	0.13	-0.49	-0.32	-0.44	-0.01	0.27	0.27	0.31	0.11	0.34
	(0.27)	(0.57)	(0.42)	(0.33)	(0.29)	(0.30)	(0.33)	(0.33)	(0.29)	(0.29)
Adjusted R^2	0.16									
N	417									

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXXIV

RETURNS TO EDUCATION, OLS AND QUANTILE REGRESSION ESTIMATES, MAINLINE PROTESTANTS, WM, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Education	0.114***	0.076***	0.089***	0.108***	0.117***	0.123***	0.131***	0.134***	0.131***	0.129***
	(0.014)	(0.038)	(0.023)	(0.017)	(0.017)	(0.018)	(0.017)	(0.016)	(0.015)	(0.015)
Years of work experience	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Other Control Variables										
Northeast	0.09	(0.07)	0.02	(0.02)	0.02	0.19*	0.17#	0.10	0.06	0.08
	(0.09)	(0.21)	(0.11)	(0.09)	(0.13)	(0.10)	(0.11)	(0.11)	(0.11)	(0.10)
North Central	-0.17**	-0.30*	-0.23**	-0.21***	-0.10	-0.09	-0.09	-0.18*	-0.22***	-0.17
	(0.07)	(0.16)	(0.11)	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)	(0.08)	(0.12)
West	0.10	-0.18	-0.20#	-0.12	-0.07	0.00	0.02	-0.06	-0.07	-0.14#
	(0.08)	(0.25)	(0.12)	(0.13)	(0.12)	(0.09)	(0.12)	(0.12)	(0.08)	(0.09)
Rural Area	-0.29***	-0.56*	-0.41*	-0.47**	-0.18	-0.18*	-0.19*	-0.18	-0.12	-0.20
	(0.11)	(0.35)	(0.23)	(0.19)	(0.17)	(0.10)	(0.10)	(0.13)	(0.13)	(0.20)
Constant	1.67***	1.77***	1.85***	1.71***	1.53***	1.47***	1.44***	1.57***	1.72***	1.88***
	(0.22)	(0.56)	(0.33)	(0.26)	(0.26)	(0.27)	(0.29)	(0.29)	(0.23)	(0.23)
Lambda	-0.82**	-1.71***	-1.89***	-1.94***	-0.88*	-0.92*	-0.42	-0.24	0.14	0.55
	(0.34)	(0.39)	(0.47)	(0.51)	(0.47)	(0.48)	(0.56)	(0.55)	(0.50)	(0.48)
Adjusted R^2	0.16									
N	450									

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXXV

RETURNS TO EDUCATION, OLS AND QUANTILE REGRESSION ESTIMATES, CONSERVATIVE PROTESTANTS,
WM, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Education	0.061***	0.046**	0.050***	0.057***	0.056***	0.054***	0.065***	0.080***	0.082***	0.088***
	(0.012)	(0.023)	(0.017)	(0.015)	(0.014)	(0.013)	(0.014)	(0.014)	(0.014)	(0.016)
Years of work experience	0.01***	0.00	0.01*	0.01#	0.01*	0.01*	0.00	0.01	0.00#	0.01
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Other Control Variables										
Northeast	-0.19*	-0.37	-0.12	-0.20#	-0.23**	-0.24**	-0.14	-0.13	-0.16#	-0.28
	(0.10)	(0.33)	(0.14)	(0.13)	(0.11)	(0.11)	(0.11)	(0.10)	(0.10)	(0.22)
North Central	-0.12**	-0.15	-0.12	-0.14*	-0.14**	-0.10	-0.08	-0.07	-0.02	-0.09
	(0.06)	(0.12)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)	(0.07)	(0.05)	(0.07)
West	0.02	-0.12	-0.02	0.00	-0.02	0.05	0.02	0.05	0.16#	0.21*
	(0.07)	(0.13)	(0.13)	(0.09)	(0.08)	(0.07)	(0.07)	(0.09)	(0.10)	(0.11)
Rural Area	-0.05	-0.07	-0.15	-0.04	-0.09	-0.14	-0.16	-0.08	-0.03	0.28
	(0.11)	(0.22)	(0.14)	(0.14)	(0.12)	(0.11)	(0.14)	(0.17)	(0.22)	(0.23)
Constant	2.29***	2.04***	2.07***	2.17***	2.40***	2.47***	2.40***	2.18***	2.31***	2.46***
	(0.19)	(0.35)	(0.27)	(0.24)	(0.23)	(0.20)	(0.23)	(0.23)	(0.22)	(0.23)
Lambda	-0.83***	-1.23***	-1.05***	-1.02***	-1.23***	-1.01***	-0.85***	-0.50*	-0.50**	-0.81***
	(0.20)	(0.48)	(0.33)	(0.28)	(0.27)	(0.25)	(0.27)	(0.27)	(0.21)	(0.25)
Adjusted R^2	0.13									
N	527									

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

TABLE XXXVI

RETURNS TO EDUCATION, OLS AND QUANTILE REGRESSION ESTIMATES, CATHOLICS, WM, AGE 27–64, PSID 2005 SURVEY YEAR [a, b, c, d, e, f]

Variable	OLS	Quantile								
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Education	0.105***	0.115***	0.110***	0.097***	0.112***	0.137***	0.118***	0.121***	0.108***	.125***
	(0.016)	(0.030)	(0.020)	(0.020)	(0.017)	(0.020)	(0.018)	(0.019)	(0.018)	(0.024)
Years of work experience	0.01	0.01	0.00	0.00	0.01	0.00	0.01#	0.01**	0.01***	0.017
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
Other Control Variables										
Northeast	0.07	0.31**	0.16	0.04	-0.03	0.03	0.08	0.01	0.00	0.13
	(0.08)	(0.13)	(0.11)	(0.11)	(0.10)	(0.08)	(0.09)	(0.10)	(0.10)	(0.12)
North Central	0.04	0.00	0.04	0.16#	-0.01	0.03	0.12#	0.01	0.00	0.01
	(0.07)	(0.13)	(0.11)	(0.10)	(0.07)	(0.07)	(0.08)	(0.08)	(0.08)	(0.09)
West	0.19**	0.32***	0.17#	0.18*	0.10	0.14*	0.15*	0.09	0.12	0.18#
	(0.08)	(0.11)	(0.11)	(0.10)	(0.09)	(0.08)	(0.08)	(0.09)	(0.1))	(0.11)
Rural Area	-0.29#	-0.18	-0.34	-0.67**	-0.31	-0.37	-0.40#	-0.21	-0.39	-0.22
	(0.19)	(0.58)	(0.43)	(0.30)	(0.30)	(0.30)	(0.27)	(0.30)	(0.40)	(0.79)
Constant	1.63***	0.55	1.00***	1.55***	1.51***	1.21***	1.64***	1.78***	2.13***	1.83***
	(0.30)	(0.58)	(0.40)	(0.40)	(0.31)	(0.34)	(0.34)	(0.38)	(0.34)	(0.45)
Lambda	-0.44	1.38#	0.51	-0.64	-0.53	-0.22	-0.84	-0.99	-1.17*	-0.01
	(0.57)	(0.89)	(0.87)	(0.77)	(0.67)	(0.61)	(0.63)	(0.73)	(0.65)	(0.75)
Adjusted R^2	0.17									
N	515									

[a] Dependent variable is natural logarithm of wage rate.
[b] Unstandardized coefficients are reported.
[c] Standard errors are in parentheses.
[d] Years of work experience squared was included in the regressions but not reported, as it was zero in all cases.
[e] The symbols (***), (**), (*) and (#) represent statistical significance at $p < 0.01$, $p < 0.05$, $p < 0.10$ and $p < 0.15$, respectively.
[f] Source: PSID, 2005 survey year; religious participation is as of 2003.

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