

Studies of Religious Behaviour from An Economic
Perspective

by

Wei Zhang

(2625902)

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Supervisor: Professor David Gray

ECO 7997

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1. INTRODUCTION

Religion is one of the most pervasive phenomena in the human experience, and thus it seems logical for economists to pay attention to religion. In recent years, some economists have been interested in the study of religion through the study of the interrelations between religious and economic variables. For example, how and to what extent do economic factors influence religious attendance? How does religion affect economic attitudes and the activities of individuals, groups and societies, such as measures of happiness and earnings? With data obtained from the 1998 General Social Survey (GSS) of Statistics Canada, this paper presents some empirical evidences on (1) the determinants of participation in religious activities, indicated by religious attendance; (2) the differences in the rates of return to human capital between the religious groups; and (3) the impact of religion on happiness.

Almost 84.2% of Canadian people reported to have an association with a religion.¹ Their religious behavior, a kind of non-market activity that consumes time, inevitably has an influence on their time allocated to other activities. As a theoretical framework, Gary Becker's theory of the allocation of time (1965) can be utilized to analyze the effect of changes in earnings on the allocation of time to religious attendance and the shifts between the religious consumption and the other commodities consumption. The central result of the human capital literature, namely that earnings rise with age until a maximum is attained and then decline, is applied to explain the age-religious-attendance profiles. In addition, this paper compares the

¹ In GSS 1998, an estimate of the number of the target population (18,501,960) having a religion is obtained by summing the final weights of the records reporting a religion. The proportion of the target population with a religion is calculated by 18,501,960 over 21,977,756 by ignoring the respondents with the answer "Don't know" or "Not stated".

determinants of religious attendances between females and males, between Christians and non-Christians, and between Roman Catholics and Protestants, respectively.

The people in the different religious groups have different earnings, different schooling years and different working experiences, as shown in table 1. On average, the male Protestants have the highest earnings and obtain more years of working experience. The male non-Christians make the greatest investment on schooling. Why are there such differences among the different religious groups? Religious affiliation may be an important dimension of family background which has an impact on economic status. As one factor of family's background, religion may have an influence on their earnings and thus lead the different religious groups in this country to differ in economic status. Moreover, perhaps the household can be viewed as producing not only human capital but also "religious capital" (depending on the inputs of time, goods and the religious knowledge and experience).² Religious capital and human capital may interact with each other. This paper examines the effects of religious affiliation on the earnings and the returns to human capital based on the equations in the previous studies.

Since the late 1990s, economists have started to develop large-scale empirical analyses of the determinants of happiness. Frey and Stutzer (2002) present several reasons for economists to study happiness: First, happiness can become one index for evaluating the net effects of economic policy. For example, the trade-offs between unemployment and inflation can be linked to those between being unemployed and holding a job. Second, through research on happiness, economists could learn more

² In Becker's theory of allocation of time (1965), the most important assumption is that households are producers as well as consumers.

TABLE 1
Sample Means for Earnings Equations

Variable	MALE				FEMALE			
	Roman Catholic	Protestants	Non-Christian	No Religion	Roman Catholic	Protestants	Non-Christian	No Religion
Earnings	40155.99	47442.53	46155.03	41268.75	25348.67	28845.48	29337.42	28334.26
Schooling year	12.9469	13.1646	14.1804	13.3376	13.1384	13.312	13.6245	13.6798
Experience	17.5823	21.0253	17.908	14.9119	16.8122	19.5012	14.1515	14.2467
University degree	21%	24%	46%	25%	22%	22%	34%	28%
Log of weeks worked	3.799	3.8426	3.82	3.7699	3.7519	3.7911	3.7922	3.7096
Self employed	16%	18%	26%	19%	7%	10%	15%	9%
Union member	28%	21%	22%	23%	27%	26%	23%	27%
Atlantic region	7%	13%	1%	5%	8%	11%	1%	4%
Quebec	48%	5%	8%	12%	46%	3%	9%	10%
Prairie region	11%	26%	13%	19%	11%	23%	21%	24%
British Columbia	5%	13%	16%	24%	4%	18%	18%	27%
Single	39%	30%	35%	45%	36%	34%	42%	41%
Father foreign born	25%	28%	84%	35%	21%	26%	77%	36%
Mother foreign born	25%	27%	81%	37%	20%	25%	82%	33%
Roman Catholic	100%	0%	0%	0%	100%	0%	0%	0%
Protestants	0%	100%	0%	0%	0%	100%	0%	0%
Non-Christian	0%	0%	100%	0%	0%	0%	100%	0%
N	1117	909	118	505	999	890	87	333

Note: University degree, self employed, union member, single = the individual obtains a university degree, or is self-employed, or is a member of union, or the individual's marital status is single. Father foreign born and mother foreign born = the individual's father or mother is born out of Canada.

about individual self-assessments of utility. Third, research into happiness expands the field of economics and “enriches our knowledge of discrimination concerning gender, ethnicity and race, and age” (p. 403). For example, we can study whether the different genders, ethnicities and races, and ages can have different subjective well-being or levels of happiness. However, for a long time, the relationship between happiness and religion was studied almost exclusively by psychologists and sociologists³. As we know, there are many motives for people to attend religious activities, such as after-life belief and spiritual satisfaction. Happiness may be one kind of motive for people to obtain current satisfaction from attending religious activities. Based on this and the third reason above, this paper is trying to analyze the impacts of religious affiliation and religious attendance on “happiness”, and examine the discrimination of the level of happiness between the groups with different religious affiliations and the group without a religion. This paper examines the effects of religion along with other important economic variables, unemployment and income, on the happiness of individuals.

The remainder of this paper proceeds as follows. The second section summarizes the recent theoretical models and empirical research of economists. The third section describes the data source, introduces the estimating equations, and presents the empirical results. The final section contains a brief summary and conclusions.

2. SURVEY OF LITERATURE

2.1 The Azzi and Ehrenberg (A-E) Model of Household Religious Participation

³ For example, Ellison (1991), Pollner (1989), Ellison, Gay and Glass (1989), Ferriss (2002).

Azzi and Ehrenberg (1975) present the first systematic attempt to analyze the determinants of individuals' religious participation in church-related activities using the allocation of time framework. In the A-E model, there is one crucial assumption, called "after-life consumption", that is, the individuals believe there is after-life, and in their viewpoints, the expected benefits are related to their lifetime allocation of time to religious activities. Therefore, the expected value of the household's "after-life consumption" is entered the household quasi-concave utility function with household's lifetime consumption as follows,

$$U = U(C_1, C_2, \dots, C_n, R), \quad (1)$$

where C_t represents the household's consumption in period t , and R the expected value of the household's after-life consumption.

Household consumption in each period is given by a household production function in which the final consumption commodity (C_t) depends upon the household's purchased market goods (X_{ct}) and the time allocated to household consumption (T_{ct}). The function is continuously differentiable and concave:

$$C_t = C(X_{ct}, T_{ct}) \text{ for all } t, C_t \geq 0, C_{11} \leq 0, C_2 \geq 0, C_{22} \leq 0. \quad (2)$$

Expected after-life consumption is a continuous, twice differentiable, concave function of the time (T_{rt}) and purchased goods (X_{rt}) devoted to religious activities by the household in all periods:

$$R_t = R(X_{rt}, T_{rt}) \text{ for all } t, R_t \geq 0, R_{11} \leq 0, R_2 \geq 0, R_{22} \leq 0. \quad (3)$$

Assumed that the household plans to leave no estate, its income constraint is given by the sum of the present value of consumption of goods equaling to the sum of present value of income (wage and non-labour income):

$$\sum_{t=1}^n [(p_c X_{ct} + p_r X_{rt}) / (1+i)^{t-1}] = \sum_{t=1}^n [(v + w_t l_t) / (1+i)^{t-1}], \quad (4)$$

where p_c is the price of the market goods in any time period and p_r is the price of the goods devoted to religious activities in any time period; w_t is the wage rate in period t ; i is a constant interest rate; v is the household's non-labour income in each period; and l_t is the hours of work in period t .

Letting T denote the total time available per period, the time constraint is given by

$$T = l_t + T_{rt} + T_{ct} \quad \text{for all } t. \quad (5)$$

Combined with the household's lifetime discounted income constraint (4) and time constraint (5), (1)-(3) comprise a well-defined multi-period utility-maximization model of household allocation of time, from which Azzi and Ehrenberg make the formal conclusions: (a) The women will devote more hours to religious activities than will the men since they face lower market wages. (b) Under the assumption that wage rates of all household members are constant over their lifetimes, the religious attendance should increase with age if the marginal product of religious activity is the same in periods $t - 1$ and t during which the individual spends an identical number of hours on religious activity. (c) However, the age-religious-participation profile is partially offset by age-earnings profiles. Therefore, the age-religious-participation profiles will be steeper for females, whose age-earnings profiles tend to be flatter, than males. The age-religious-participation may be U-shaped, declining at young ages and then increasing, when the age earnings profiles are concave, with the rate of increase in earnings decreasing with age. (d) A-E model also presents the substitution effects between time and money spent on the religious activities. The individual with lower wage rate tends to supply more time to religious activity, leading to a negative

compensated substitution. According to the theory of allocation of time, when the wage rate increases, the opportunity cost of religious activities will increase, leading to less religious activities. Moreover, religious activities are time-intensive commodities. If the wage rate increases, the cost of time-intensive commodities will be higher than the goods-intensive ones, leading consumption to shift from time-intensive commodities to goods-intensive ones. However, as long as expected after-life consumption is a normal good, the increase in the income will lead to an increase in religious activities, that is, the income effect is positive. Thus, the uncompensated substitution effect is ambiguous in sign.

The results from empirical tests are not all identical to Azzi and Ehrenberg's conclusions. Their own analysis of survey data and that of Ehrenberg (1977) provide strong support for their conclusions, especially the ones indicating that females' age-religious-participation profiles are steeper than males', and that for one group of males the profiles are U-shaped. But Long and Settle (1977) obtain results, in contrast to the A-E findings, which do not reveal any significant relationship between frequency of church attendance and age, non-wage income or wealth. Ulbrich and Wallace (1983) do not find any evidence showing that religious activities increase with age among those who believe in an after-life. They find that there is a drop in the size and significance of the dummy variable indicating belief in an after-life between 1973 and 1980, which suggests an increase in the relative importance of the other motives such as "consumption motive". The number of children aged 7-12, city size and region as determinants of attendance also tend to suggest the importance of other motives — children's religious education, availability of other social opportunities,

concentration of people with the same religion in the region — all supporting the “consumption motive”. What their findings do strongly suggest is that “self-reported religious intensity, which undoubtedly contains elements of current consumption benefits, is a more important determinant of church attendance than belief in an after-life” (p.50).

2.2 Extensions of the A-E Model

The A-E model emphasizes a “salvation motive” for religious participation; however, it recognizes that there also exists a “consumption motive” --- the individual obtains current satisfaction from participation in religious activities because of inherent religious beliefs or purely social reasons. Arizz and Ehrenberg (1975) replace their original household utility function (1) by

$$U = U(C_1, S_1, C_2, S_2, \dots, C_n, S_n, R), \quad (6)$$

where S_t is the consumption value of religious participation in period t . It is assumed to be a continuous concave function of household’s time and goods devoted to religious activities during the period:

$$S_t = S(X_{rt}, T_{rt}) \text{ for all } t, S_1 \geq 0, S_{11} \leq 0, S_2 \geq 0, S_{22} \leq 0. \quad (7)$$

The religious attendance probably will not increase with age because of the “consumption motive”. However, if the salvation motive is substantially more important to individuals than the consumption motive, the conclusions obtained from the original A-E model are still likely to continue to hold.

Iannaccone (1998) treats religious commodities as a form of “consumption capital”. The religious commodities will depend on not only the individual’s devoted

time and goods, but also how much knowledge, experience and training the individual gets from the religious activities such as church ritual, doctrine and worship. The A-E model is extended to include “religious human capital” and the religious commodities production is replaced by

$$R_t = R(X_{rt}, T_{rt}, S_{rt}) \text{ for all } t, \quad (8)$$

where S_{rt} stands for the stock of the related knowledge and experience obtained from one’s past religious activities at the beginning of period t , that is, the stock of religious human capital. The religious human capital obtained in period t amounts to the increments to the stock of religious human capital (ΔS_{rt}), which is a positive function of the goods, time and religious human capital dedicated to religion in the past periods:

$$\Delta S_{rt} = F(X_{rt-1}, T_{rt-1}, S_{rt-1}). \quad (9)$$

There is another model in which religiosity is treated as a kind of consumption good within a human capital framework. Neuman (1986) outlines his theoretical model of the time allocated to religious activities within a human capital framework:

$$\text{Max } U(C, R(X_r, T_r)),$$

Subject to:

$$Y_0 + w * l = P_c * C + P_r * X_r \text{ (a budget constraint),}$$

$$L_0 = l + T_r + T_c * C \text{ (a time constraint),}$$

where Y_0 is non-labour income; w is the wage rate; l is number of hours of work; P_c and P_r are price vectors of consumption and religious goods and services; L_0 is the total time available. The A-E model assumes that households are producers and consumers, which is same as the assumption of Becker’s theory of allocation of time.

However, in this model, it is assumed that C is purchased in the market place and not produced by the individual or household. Using the second-order conditions for optimum, Neuman examines how changes in each of the exogenous variables affect each of the decision variables by means of comparative statics, and especially how changes in the wage rate affect the time allocated to religious activities. A brief summary is given in the following table (p.1195):

	dC	dX _r	dT _r
dY ₀	+	+	-
dw	+	+	-
dL ₀	+	-	+
dI	?	+	-
dP _c	-	?	+
dP _r	?	-	?
dT _c	-	+	?

One advantage of Neuman's empirical analysis is that the dependent variable is not the frequency of religious attendance but "time allocated to religious activity" which is continuous and has a wide range of values. This is in contrast to other studies, which employ discrete measures of religious activity. The main empirical findings (p.1200) concern the hypotheses that derive from relating the results of his theoretical model to central findings from the human capital literature. (1) Specifically, time devoted to religious activity declines with the wage rate; (2) the age profile of time devoted to religious activities is U-shaped; (3) as the level of education rises, the age at which time devoted to religious activities reaches the minimum point increases. It supports the finding of human capital models: the rightward shift of the maximum earnings age.

Thus, after-life expectations are no longer the only explanation for the positive effect of age on religious activities. Alternative explanations, however, are available

in the literature. Neuman (1982) argues that the positive impact of age on religious activities may be explained in the same way as the outcome of a model of habit formation (as defined by Pollack, 1970): the time spent on religious activities in period t is positively related to the time spent on religion in the past periods, and when one ages, he or she will spend more time on such activities. This is a persistence effect. Ulbrich and Wallace (1983) treat church attendance as a leisure activity, supporting the consumption motive approach. They argue that the positive age coefficient may be due to changing tastes for religiosity over time: elderly people may already have acquired their tastes or preferences for religious activities when they were young. Having acquired much religious consumption capital, they tend to continue earning a higher return on the dominant form of leisure activity than that on any other leisure activities on which they invest less time and goods in the past. Iannaccone (1998) argues that participation can grow over time due to (rational or myopic) "addiction".

As a form of "consumption capital", the religious capital is different from the human capital. Although the religious capital may vary greatly across denominations, it is quite specific for a definite denomination because each denomination of religion has its own specific doctrine, ritual and style of worship. Thus, it is transferable to other communities across the regions. Furthermore, unlike general education and occupational experience and training obtained from different institutions, most religious knowledge, experience and training come from parents and the religious institution they support. Such characteristics of religious capital enable us to make the following predictions, which have been supported by empirical research: (a) The rates

of conversion between similar particular religious groups are higher than between distinctive groups. (b) Conversions among older people should be less than among young people because over time, the costs of switching increase when one has accumulated some capital to a specific religion. (c) People tend to get married within their religion. Neuman (1986) observes that there is positive association between a husband's and a wife's religiosity and explains that the partners can avoid potential conflict over values and life-style, and have a positive influence on the levels of religiosity of each other if they have the same religiosity.

2.3 Previous Empirical Research on the Effect of Religion on Earnings

A sociologist named Gockel (1969) examines the family income differences among thirteen religious groups based on a sample of male, fully employed individuals in 7,518 households from the 1962 national survey of the United State. Permitting religious affiliation to interact with education and occupation, he studied the separate effects of the two variables on the income for each religious group. He found that "in general, those groups with higher educational achievement receive a higher increment of income per year of schooling completed" (p.642). However, the group without a religion having a lower education level obtains a higher payoff from the education investment than do Protestants and Catholics. Gockel also found that Catholics and Protestants have virtually identical educational attainments but Catholics earn more than Protestants by controlling for education and occupation. The possible reason is that Catholics use their education to greater financial advantage than do Protestants.

In Gockel's income equations, the dependent variable is typically family income rather than log of earnings, which is used in the "human capital" framework.

Religious affiliation represents one dimension of family background that has an important impact on economic status. As mentioned above, the household can produce not only human capital but also "religious capital". The two kinds of capital may interact with each other. Greater human capital may increase the capacity of one person to learn religious knowledge and obtain more religious capital. The family with a high stock of religious capital tends to make more investment on human capital. Human capital and religious capital may thus interact in the labour market. The good personality traits (honesty, loyalty, etc) obtained from the religious training may benefit the people in the labour market and may increase the returns to human capital. However, some religious denominations may forbid some occupations or prohibit women from working. Such restrictions may reduce the returns to human capital.

Recently economists have focused on the studies of the effects of religious affiliation on the returns of human capital by adopting the human capital formulation, regressing the log of earnings on schooling, experience, etc. Using 1971 Canadian Census data, Tomes (1983) performs a regression analysis on the total income of the native-born white males (between 25 and 64). He found that the returns to Jews from schooling and experience exceed those to Protestants and Catholics and some of the differences are statistically significant. However, it is interesting that "credential" effect of a university degree for Jews, holding years of schooling constant, is less than for the other groups. In fact, the degree coefficient for Jews is small and insignificant.

Comparing the Protestants and Catholics, he found that the returns to Protestants from schooling, working experience and a university degree are all substantially and significantly higher than those of Roman Catholics. Tomes also estimates earnings functions for the four religious groups over four various subsamples: Quebec and the rest of Canada (for their possible different language skills and other different family background); and Toronto and Montreal metropolitan areas (for comparing the differences between urban and rural locations). For the two subsamples, Canada excluding Quebec and Toronto, the results are similar to those obtained for the whole of Canada. However, the results for Quebec and Montreal display less significant differences between religious groups. In the Montreal sample, it is Catholics who have the highest returns to schooling, whereas previously that was the case for Jews. In the Quebec sample, the returns to schooling for Protestants are the highest.

Tomes (1985) presents some different results based on the 1981 Canadian Census, comparing them with those based on corresponding 1970 data. First, there is some evidence that Jews do not receive higher returns to human capital, and the differences between the returns to Jews from schooling and experience and those to non-Jews are considerably smaller. Second, the coefficient of university degree is significant for Jews as for the other groups. Third, contrary to the results for 1970, the payoffs to Catholics from a university degree in 1980 exceed those to Protestants, especially in the Quebec subsample.

There are two hypotheses regarding the interaction between religion and the returns to human capital. One concerns the earnings of Jews. Becker (1981) has conjectured that the high income of Jews is explained by high marginal returns on human capital

investments. In contrast, Brenner and Kiefer (1981) argue that since Jews have higher income and make greater investments in human capital, which is embodied and transportable, and thus receive a lower marginal rate of return. The other hypothesis concerns the returns of Catholics. Catholics are predicted to have a larger number of children than the other religious groups because of the additional psychic costs of birth control. According to the quality-quantity models (Becker and Tomes, 1976), Catholics thus make less investment per child, receiving a higher rate of return on their investments.

Tomes' results (1983) have tested the two hypotheses: First, the results support the prediction of Becker. The higher rate of return to human capital leads to higher investment in human capital, based on the result that Jews receive a higher rate of return on human capital. Second, the result that Catholics have the lowest rate of return to human capital is against the prediction of the second hypothesis. Tomes concludes that the lower rate of return to human capital for Catholic families leads them to have larger size families (more children) because they face a higher price of quality relative to quantity (numbers of children).

2.4 Happiness Research

Diener and Diener (1995, p.653) defined Subjective Well-being (SWB) as “a person’s evaluative reactions to his or her life--- either in terms of life satisfaction (cognitive evaluations) or affect (ongoing emotional reactions)”. Happiness or life satisfaction is often presented as synonymous with SWB by many researchers⁴.

⁴ For example, Ellison (1991), Pollner (1989), Ellison, Gay and Glass (1989), Ferriss (2002), Oswald (1997).

Therefore, happiness can be one measure of SWB. The empirical research on the effects of unemployment, income and religion is reviewed below.

2.4.1 Unhappiness and Unemployment

How does personal unemployment affect an individual level of happiness? Many studies for different countries and time have the similar answers that the personal unemployment leads people to be very unhappy. Clark and Oswald (1994) try to test the hypothesis that unemployment is voluntary with the data from the new British Household Panel Study. The way they assess the people's feelings of subjective well-being is to calculate "caseness scores"⁵ by working with the responses to the General Health Questionnaire (GHQ) which includes twelve questions. The larger the score, the lower the level of subjective well-being is. From their regression, they find that "joblessness depressed well-being more than any other single characteristic (including important negative ones such as divorce and separation)." (p.655) The finding rejects the hypothesis that unemployment is voluntary.

2.4.2 Happiness and Income

The relationship between happiness and income at a point in time and place has been found that those with higher income, on average, are happier than those with lower. Easterlin (2001) has presented a significant positive bivariate relationship between happiness and income by the data from the 1994 General Social Survey (GSS) of the United States. Moreover, when a large number of other factors are controlled for in multiple regressions, the income is also proved to have a significantly positive influence on happiness (Pollner 1989).

⁵ Sum up the number of times the individual defines himself or herself into the fairly stressed or highly stressed category for the twelve questions, and then arrive at one score ranging between 0 and 12.

2.4.3 Happiness and Religion

Many Psychologists and socialists studied the multifaceted relationships between religious involvement and subjective well-being. Ellison, Gay and Glass (1989) deal with the data from the 1983 GSS (United States) and display a series of six multiple regression models, with general life satisfaction as the dependent variable. Their regression results confirm the statistically significant relationships between affiliation, participatory and devotional aspects of religiosity and general life satisfaction (p.117). The same conclusion applies to Pollner (1989)'s regression of well-being measures. Church attendance is significantly related to general happiness. However, different results appear when Ellison (1991) analyses the data from the 1988 GSS. The church attendance is no longer a significant correlate of life satisfaction or happiness, and his model shows weakly significant net influence of religious affiliation.

3. EMPIRICAL ESTIMATES

In this section, I describe the data source and the variables, check the problems with the data, present the equations of religious attendance, earnings and happiness, and analyze the regression results.

3.1 Nature of Sample and Data

The data resource to be used is the 1998 General Social Survey of Statistics Canada. The response rate was 77.6%, yielding 10,749 respondents. The sample represents all non-institutional residents with telephones residing in the ten provinces. From each respondent's questionnaire, data were extracted on the variables used in the estimates.

Some important variables, together with a description of the form in which they were collected and used in the analysis, are described as follows.

Religious attendance: In order to obtain the exact frequency of religious attendance in one year, I transform “at least once a week” into “52”, “at least once a month” into “12”, “a few times a year” into “4”, at least once a year” into “2” and “not at all/ never” into “0”. In the survey, only the people who were reported to have a religion were asked how often they attend religious service or meetings in the last 12 months. It is one drawback of the data since in fact someone without a religious affiliation might participate in religious activities. Thus, my regressions including the variable religious attendance have to be restricted to the people who declare religions and I lose 1,530 observations (no religion)⁶.

Earnings or wage income: Each individual reported his or her “annual personal income” by selecting one of twelve class intervals. However, in the models I just think about the income from wages, salaries, commissions and tips. Therefore, I just focus on the respondents reporting their main resource of income as “Employment or self-employment”⁷. These people’s personal income can be equal to their wage income. The midpoint of each interval is used to score the wage income. For example, “less than \$5,000” is scored by \$2,500, “\$100,000 or more” is scored by \$110,000.

Happiness: All respondents were asked to describe themselves, presently, on a four-point scale of happiness. “Very happy” = 1, “somewhat happy” = 2, “somewhat unhappy” = 3, “very unhappy” = 4. In my regression, I recode the variable inversely. The higher level of happiness is assigned a larger value.

⁶ The individuals without religion are dropped only for the analysis regarding religious attendance.

⁷ Income from wages, salaries, commissions and tips plus net income from self-employment.

Age: The ages of all the respondents are between 15 and 80.

Religious denomination: There are four main religious groups: Roman Catholics, Protestants (United Church and Protestant), non-Protestants and no religion. In order to compare the difference between Christians and non-Christians, Roman Catholics, Protestants constitute the Christian group, and non-Protestants and others constitute the non-Christian group.

Education: Formal education has been recoded into years of schooling under the assumption that university entrance at the completion of grade 12 as follows: “Elementary school/no schooling”=5; “Some secondary/high school”=10; “High school diploma”=12; “the education level higher than high school diploma and lower than bachelor’s degree”=13.5; “Bachelor’s degree”=15.5; and “Doctorate/master/some graduate”=17.5.

Health Status: All respondents were asked to describe their state of health as “Excellent”, “Very good”, “Good”, “Fair” or “Poor” by comparing to other people of their ages. I code it as: “Poor”=1, “Fair”=2, “Good”=3, “very good”=4, and “excellent”=5.

Single: The marital status of the respondents is reported. “Widowed”, “divorced”, “separated” and “single (never married)” are treated as single observations; “Living common-law” and “married” are not single.

Experience: Unfortunately, working experience was not reported in the data. However, the variable experience can be estimated as the difference between age and the years of schooling minus six (age-school-6).

Weeks worked: The number of weeks employed during the last 12 months ranges from 1 to 52. Only the employed were asked.

Self-employment or paid worker: Respondents with a job were asked whether they are paid workers or self-employed.

Employment: The labour force statuses of the respondents are stated as “full-time”, “part-time”, “student with full-time or part-time employment”, “student only, no employment” and “no hours of regular employment”. The first three statuses can be taken as “employed”, and the last two as “jobless”.

Stress: The variable is included in the happiness equations. It is obtained by asking respondents whether they experienced, during the past 2 weeks, a lot of stress, a moderate amount of stress, relatively little stress, or almost no stress at all. I recode the variable as: “no stress”= 1; “relatively little stress” = 2; “moderate stress” = 3; “a lot of stress” = 4.

The survey had a complex design, with stratification and multiple stages of selection, and unequal probabilities of selection of respondents. The survey weights must be used when producing estimates or performing analyses in order to account as much as possible for the geographic over- and under-representation and for the under- or over- representation of age-sex groups, months of the year, or days of the week in the unweighted file. The weights on the data are rescaled by dividing each weight by the overall average weight for all the observations before the estimation and analysis are conducted.

The regression analyses apply the method of OLS (Ordinary Least Square). Before employing OLS, it is important to check whether the basic assumption of

homoskedasticity is satisfied. All the regressions in the paper are worked out by the statistical package SPSS. In SPSS, there is a method, Levene's test⁸, to test the null hypothesis that the error variances of the dependent variable are not significantly different. The test results show that there exists a serious heteroskedasticity problem⁹ in the religious attendance equation for the male Catholics group and the earnings equation for the male non-Christian group. To overcome the problem, one can reduce the alpha level. For the happiness equations, there is not such a problem. Therefore, in general, the OLS can still be used.

To detect whether there is a multicollinearity problem with the data, one way is to look for results where R^2 and F statistic seem to be high but t ratios seem to be very low. The R^2 s are all very low for the religious attendance and happiness equations. It is hard to find the sign of multicollinearity. However, there probably exists a multicollinearity problem for the earnings equations especially for the male and female non-Christian groups because of the high R^2 s and low t ratios.¹⁰

In addition, this paper assumes that there is no endogeneity problem with the data. There are two reasons for paying less attention to the three problems in this paper: one is that the paper concerns mostly statistical models rather than econometric ones; the other is that this paper cites the similar specifications with the equations contained in the existing literature. No articles attempt to make a check for all the above

⁸ The null hypothesis is that the error variance of the dependent variable is equal across the groups. When the probability (significance) is greater than 0.05, do not reject the null hypothesis. At the same time, we also should look at the ratio of the largest within-groups variance to the smallest. The ratio is F. If F is equal to 9 or greater then the effect is to inflate the alpha level. To overcome the problem, the alpha level should be reduced to 0.01.

⁹ F is greater than 9.

¹⁰ All the regression results including t ratios and R^2 s are shown in the following parts 3.2, 3.3 and 3.4, respectively.

problems with the data. However, the OLS estimators obtained in the paper probably have biased errors for the three problems concerned.

3.2 Religious Attendance Equations

One major weakness of the survey is its failure to report religious affiliation and frequency of religious attendance of the individual respondents' spouses. It is predicted that the individuals whose spouses have the same affiliation could attend religious activities more frequently than do those whose spouses have different affiliations. I am thus limited to explain my regressions across individuals and not both husband and wife simultaneously. The second major weakness is that individuals in the sample were not asked whether they believe in a life after death. Therefore, I can not test whether or not belief in after-life does affect religious attendance as did in A-E model.

However, a sufficient number of variables were reported by individuals in the sample to enable us to specify an estimating equation from "consumption motive" viewpoint. In the equation, an individual's annual frequency of religious attendance is related to variables including age, age squared, sex, marital status, the number of children under the age 4, the number of children between the ages of 5 and 12, education, wage income, health status and hours worked. It is shown as follows:

$$\begin{aligned} \textit{Religious Attendance} = & \beta_0 + \beta_1 \textit{Age} + \beta_2 \textit{Age}^2 + \beta_3 \textit{Kids 0-4} + \beta_4 \textit{Kids 5-12} + \beta_5 \textit{Male}^* \\ & + \beta_6 \textit{Single} + \beta_7 \textit{Edu} + \beta_8 \textit{Wage} + \beta_9 \textit{Good health} + \beta_{10} \textit{Fair health} + \beta_{11} \textit{Poor health} + \\ & \beta_{12} \textit{Hours worked} + \beta_{13} \textit{RC}^* + \beta_{14} \textit{PRO}^* \end{aligned}$$

(* Dummy variables indicating male, Catholics and Protestants that are not in the equations for male, female, Catholics and Protestants groups)

Table 2 presents estimates of the empirical religious attendance equation for all individuals with a religion, Roman Catholics, Protestants, male individuals with a religion, male Roman Catholics, male Protestants, female individuals with a religion, female Roman Catholics and female Protestants, respectively¹¹. The results are in accordance with expectations.

A major conclusion of the A-E model is that females' time devoted to religious activities should rise more rapidly with age than males', since the age-earnings profiles tend to be flatter for females than for males. Furthermore, if there is a sufficiently large increase in the wage between two periods, the religious attendance may actually decline between the two periods. Therefore, the age-earnings profiles are concave, rising with age first and then declining, given that they are standard. In contrast, the age-religious-attendance profiles may be U-shaped¹², first declining with age and then increasing. To test the shape of age-religious-attendance profiles, I add the age squared as one explanatory variable.

Table 2 shows that the age-religious-attendance profiles are U-shaped in 4 cases: all Catholics, all Protestants, male Catholics and female Protestants. Only for the male Protestants group does the religious attendance have no significant relation with age. In the other cases, the religious attendance increases with age strictly. Table 3 presents the estimated coefficients of the age and age squared variables by sex for all individuals with a religion, Roman Catholics and Protestants, respectively. The estimated "turning age" and the estimated "overtaking age" are presented, too.

¹¹ We do not present estimates for non-Christian since the group is a very small sample with only 488 observations. There are few non-Christian observations left with all the variables included in the religious attendance equations.

¹² In Neuman's model (1986) within a human capital framework, the age profile of time devoted to religious performance is U-shaped.

TABLE 2

Frequency of Religious Attendance Regressions

Variables	Individuals						Male						Female					
	All (1)	All (1)	All (2)	Catholic	Protestants	All (1)	All (2)	All (2)	Catholic	Protestants	Protestants	All (1)	All (2)	All (2)	Catholic	Protestants		
Constant	20.169	12.945	26.982	15.902	33.68	11.019	26.38	23.633	16.786	17.191	15.751	29.303	4.315***	-4.395	55.175			
	5.258***	4.811***	6.68***	3.086***	5.674***	3.126***	5.15***	3.698***	2.122**	3.004***	3.724***	4.315***	-0.748	5.712***				
Age	-0.292	0.172	-0.255	-0.409	-0.44	0.135	-0.218	-0.812	0.109	8.43E-02	0.213	-0.497	0.418	-1.312				
	-1.632	5.234***	-1.434	-1.663*	-1.649*	3.015***	-0.968	-2.638***	0.317	1.237	4.352***	-1.572	6.263***	-2.752***				
Age squared	5.77E-03		5.28E-03	8.63E-03	5.60E-03		4.19E-03	1.19E-02	-2.93E-04		9.16E-03			1.62E-02				
	2.64***		2.422**	2.817***	1.757*		1.571	3.205***	-0.074		2.26**			2.687***				
Kids 0-4	0.841	0.691	0.93	5.97E-03	2.359	-0.124	0.149	-1.913	3.664	3.663	1.66	2.042	2.599	-0.131				
	1.15	0.947	1.277	0.006	2.079**	-0.134	0.162	-1.629	2.583***	2.584***	1.385	1.693*	1.646*	-0.069				
Kids 5-12	1.587	1.261	1.506	1.737	1.774	2.215	2.365	2.565	3	3.016	-0.313	0.244	0.619	-0.107				
	3.236***	2.655***	3.083***	2.67***	2.351**	3.586***	3.769***	3.114***	3.118***	3.215***	-0.418	0.309	0.61	-0.088				
Male	-0.982	-0.684	-1.073	-2.489	-0.207													
	-1.351	-0.952	-1.48	-2.591***	-0.184													
Single	-3.198	-2.833	-3.238	-2.478	-4.03	-3.353	-3.654	-3.316	-3.611	-3.63	-2.311	-2.944	-1.666	-4.582				
	-3.877***	-3.482***	-3.943***	-2.293**	-3.138***	-2.861***	-3.098***	-2.19**	-1.925*	-1.956*	-2.024**	-2.526**	-1.08	-2.54**				
Education	0.163	0.116	7.96E-02	-0.15	4.89E-03	0.284	0.189	0.124	0.238	0.241	-0.137	-0.121	0.309	-1.62E-01				
	1.023	0.731	0.498	0.715	0.019	1.426	0.94	0.477	0.738	0.754	-0.517	-0.455	0.864	-0.382				
Wage income	-3.13E-05	-3.60E-05	-3.53E-05	-6.03E-06	-5.28E-05	-3.19E-05	-2.87E-05	4.26E-05	-8.76E-05	-8.73E-05	-4.11E-05	-3.63E-05	-1.04E-04	1.35E-05				
	-1.835*	-2.122**	-2.073**	-0.25	-2.101**	-1.563	-1.407	1.524	-2.879***	-2.906***	-1.297	-1.132	-2.201**	0.293				

Good	-0.43	-0.501	-0.419	-1.323	-0.529	-1.084	-0.743	-2.118	0.298	0.31	0.106	1.34E-03	7.31E-02	-1.346
	-0.583	0.679	0.57	-1.373	-0.457	-1.109	-0.765	-1.721*	0.191	0.2	0.094	0.001	0.048	-0.781
Fair	-3.077	-3.325	-3.075	-3.071	-2.285	-4.329	-3.871	-3.2	-3.515	-3.502	-2.081	-1.998	-2.9	-1.38
	-2.467**	-2.672***	-2.476**	-1.862*	-1.204	-2.59***	-2.327**	-1.504	-1.359	-1.358	-1.116	-1.073	-1.126	-0.496
Poor	1.701	1.365	1.596	-0.522	0.962	3.173	3.568	0.509	4.343	4.36	-1.963	-2.039	-4.902	-1.591
	0.589	0.473	0.555	-0.135	0.221	0.889	1.007	0.122	0.673	0.677	-0.399	-0.415	-0.547	-0.269
Work Hours	-0.131	-0.145	-0.127	-4.43E-02	-0.236	-0.135	-0.12	-7.36E-02	-0.18	-0.179	-0.169	-0.144	2.41E-02	-0.33
	-4.851***	-5.495***	-4.743***	-1.194	-5.923***	-4.073***	-3.573***	-1.658*	-3.463***	-3.498***	-3.761***	-3.143**	0.37	-5.003***
RC			-7.296				-9.488					-3.095		
			-5.441***				-5.687***					-1.368		
PRO			-5.711				-8.124					-1.247		
			-4.174***				-4.759***					-0.543		
R ²	0.036	0.034	0.045	0.052	0.061	0.039	0.057	0.058	0.067	0.067	0.031	0.037	0.059	0.076
N	3491	3491	3491	1779	1535	1841	1841	948	786	786	1649	1649	830	748

Note: t-statistics on the second lines; dependent variable is annual religious attendance; Kids 0-4 = number of children under age 4; Kids 5-12 = number of children between the ages of 5 and 12; Male, Single, RC, and PRO = dummy variables that equal to "1" when the individuals are male, or single, or belong to Roman Catholic or Protestants, the non-Christian group is treated as the reference group in the regressions "all (2)"; Good, Fair, and Poor = dummy variables that equal to "1" if the health status is "good", "fair", or "poor", and health statuses "excellent" and "very good" are treated as the reference group; education = years of schooling.

* significant at 0.10; ** significant at 0.05; *** significant at 0.01.

TABLE 3
Estimated Impact of Age and Age Squared on Religious Attendance by Sex

Religion	Male			Female			Overtaking Age
	Age	Agesq	Turning Age	Age	Agesq	Turning Age	
All	0.135	--	Always Increasing	0.213	--	Always Increasing	15
Catholic	-0.812	0.012	34 Min	0.418	--	Always Increasing	52
Protestants	--	--	--	-1.312	0.0162	39 Min	--

Note: Agesq = age squared; Turning age = age at which religious attendance reaches a minimum (min) or a maximum (max); Overtaking age = age until which the age-religious-attendance profile is steeper for females than males. "--" means the coefficient is not significant.

“Turning age” is the age at which the religious attendance reaches a minimum or a maximum for one group; “overtaking age” is the age at which the age-religious-attendance profile for females begins to be steeper than for males. For the individuals who are Catholics, the overtaking age occurs at the age of 52. That is, just as expected, the slope of the age-religious-attendance profile is steeper for females than for males at the age of 52 when the male age-earnings profiles tend to be steeper than female profiles. For all the individuals who have a religion, however, the slope of the age-religious attendance profile is always steeper for females than for males ($0.213 > 0.135$). Since my regressions are restricted to individuals who are older than 15 years of age, this means that among all the individuals with a religion, females attend religious activities more frequently than males at one particular age greater than 15 when the earnings of females are less than males.

From his theoretical model and empirical analysis, Neuman (1986) has drawn the conclusion that controlling for age, the wage rate has a negative impact on time devoted to religious activities. In the regressions in table 2, for some cases, the wage income has a significantly negative effect on the religious attendance, thereby assigning a high opportunity cost of time for those who engage in non-market activities. Moreover, the religious activities are more time intensive than the other consumption commodities (goods-intensive commodities). The increasing wage income increases the cost of time-intensive commodities more than that of goods-intensive ones. Consequently, consumption would be shifted from religious activities to some other goods-intensive commodities as the wage increases. A higher opportunity cost of non-market activities and a shift from time-intensive commodities

would result in a reduction in the total time spent in consumption, and thus an increase in time spent at work. Therefore, it is not surprising to see that religious attendance decreases with hours worked per week significantly, as time is of limited quantity. The more time spent on an activity, the less time spent on the competing activities.

The presence of preschool-age children (younger than 4), or an individual's years of schooling are supposed to increase the opportunity cost of time and thus reduce the frequency of religious attendance. In contrast, the social value of religious activity may be higher for individuals with school-age children, as parents desire the children to acquire more knowledge and experience regarding to religion in order to increase their religious human capital and possibly the returns to human capital. However, it is surprising that the number of children younger than age 4 affects religious attendance positively when it is significant. The education variable is not statistically significant in my estimates. One possible explanation is that in the sample, the individuals who have already finished their schooling years overweight those who are still in school.¹³ The coefficients of education may reflect the general tendency of higher educated people to attend organized activities. Therefore, the impact of the increased opportunity costs of time is offset by it. As expected, an increase of the number of children between ages of 5 and 12 increase the religious attendance.

The dummy variables were defined for three categories of health status: good, fair and poor. Compared with those individuals in excellent or very good health status, those with good or fair health attend religious activities fewer times per year. An interpretation is that poor health increases the cost of religious attendance. On the

¹³ Only 10.7% of all the respondents are students according to the labour statuses for the respondents.

other hand, the positive association between old age and poor health probably may lead individuals with poor health to attend religious activities more often.¹⁴ The two opposing impacts may offset each other and then explain why all the coefficients are insignificant for poor health.

In all regressions, the coefficients of single variable (for marital status) are mostly significant. The single individuals attend religious activities more frequently than those married or living with partners in common law. The coefficients of the male variable are significant for the Roman Catholic group. As expected, females attend more frequently than males.

In my estimates, I can compare the frequency of religious attendance among the religious denominations. The regressions “all (2)”¹⁵ in table 2 include the dummy variables **RC** (Catholics) and **PRO** (Protestants) in order to compare with the non-Christian group. For males, Roman Catholics and Protestants attend less frequently than non-Christians. The coefficients of variables **RC** and **PRO** are not significant for females.¹⁶ The differences of the age-religious-attendance profiles between Roman Catholics and Protestants are presented in table 3. The males’ age-religious-attendance profiles for Catholics are U-shaped but for male Protestants, age does not affect religious attendance significantly. The religious attendance of female Catholics increases with age strictly but the age-religious-attendance profile for female Protestants is U-shaped. There are also some other differences. The religious attendance for Roman Catholics and Protestants presents exact opposite patterns by

¹⁴ Because the religious attendance increases with age around after thirties as shown in table 2, the old people tend to attend religious activities more frequently.

¹⁵ The regressions “all (2)” in table 1 focus on the individuals declaring a religion. The regressions pool Roman Catholics and Protestants together and treat non-Christian group as the reference group.

¹⁶ The results may have error for the small sample of non-Christian.

sex, in terms of wage income. For Roman Catholics, the males' wage income reveals no significant relation with their religious attendance. However, the females' wage income affects their religious attendance significantly. In contrast, for Protestants, the coefficient of males' wage income is significant but that of females' is insignificant. Thus, the effects of the wage income on religious attendance are strikingly different for women and men.

Despite all these statistically significant effects, observable factors account for only a small fraction of the total variance in the survey data on religious attendance. For all the regressions, all R^2 s are very small, less than 10%, which imply that low explanatory power of the explanatory variables.

3.3 Earnings Equations

The family background plays an important role in affecting an individual's economic status. Earnings is one main index of economic status. By analyzing the data, I examine religion as one factor of family background that influences earnings and the rate of return on human capital. However, the survey does not contain too much information on family background. Only religious affiliation and parents' birthplace are available. Parents' income, education and religious affiliations could not be included in my estimates. Therefore, the estimated effects of religion on earnings are "gross effects" that are likely capturing other effects associated with family background. While the previous empirical research has focused exclusively on males, my estimates focus on both males and females.

The variables used in the empirical analysis are defined in table 4. The sample means for selected variables are presented in table 1 (shown in the introduction part).

My estimating earnings equation is as follows:

$$LNEARN = \beta_0 + \beta_1SCHOOL + \beta_2EXP + \beta_3EXPSQ + \beta_4UNV + \beta_5SELF + \beta_6UNION + \beta_7AC + \beta_8QU + \beta_9PR + \beta_{10}BC + \beta_{11}SINGLE + \beta_{12}FBF + \beta_{13}FBM + \beta_{14}LNWKS.$$

It follows what Tomes (1983) applied. He adopts the human capital estimating equation in the work of Mincer (1974) with the log of earnings as the dependent variable and schooling, experience and its square, and the log of weeks worked¹⁷ as major explanatory variables. Therefore, controlling the log of weeks worked, variations in the dependent variable reflect differences in weekly earnings.

In addition, five categories of dummy variables concerning the individual's personal background appear in the equations. First, to compare the differences in earnings between single people and married people, I introduce the dummy variable for marital status. Second, the different regional dummy variables are added in order to control for the different levels of cost of living or economy across the regions in Canada. Third, we generally expect a correlation between attainment of a university degree and skill level. Adding a dummy variable "unv", I can measure the effect of obtaining a university degree on earnings independently of the number of years of schooling. The earnings may show a discrete increase with the obtainment of a university degree. Moreover, when the "unv" variable is controlled for, the coefficients of "school" can be interpreted as the rate of return from the years of schooling, the effect of the accumulation and continuous process of schooling on the

¹⁷ The number of weeks employed during the last 12 months, ranging from 1 to 52. The log of weeks worked is over the same year during which earnings were measured.

TABLE 4
Definitions of Variables for the Earnings Equations

LNEARN	Natural log of earnings (income from employment or self-employment)
SCHOOL	Years of schooling
EXP	Experience = (age – school – 6)
EXPSQ	Experience squared
UNV	University degree (dummy variable)
SELF	Self-employment (dummy variable)
UNION	Union members or covered by union contracts
REGION	AC: Atlantic region; QU: Quebec; ONT: Ontario (reference group); PR: Prairie region; BC: British Columbia (dummy variables)
SINGLE	Single including never married, widowed, divorced and separated (dummy variable)
FBF	Father born outside Canada (dummy variable)
FBM	Mother born outside Canada (dummy variable)
LNWKS	Natural log of weeks worked
RELIGION	RC: Roman Catholic; PRO: Protestants; NONCHR: non-Christian; RE: no religion (dummy variables)
RELIGION*SCHOOL	RCSCH: RC*SCHOOL; PROSCH: PRO*SCHOOL; NONSCH: NONCHR*SCHOOL; RESCH: RE*SCHOOL (dummy variables)
RELIGION*EXP	RCT: RC*EXP; PROT: PRO*EXP; NONT: NONCHR*EXP; RET: RE*EXP (dummy variables)
RELIGION*EXPSQ	RCTSQ: RC*EXPSQ; PROTSQ: PRO*EXPSQ; NONTSQ: NONCHR*EXPSQ; RETSQ: RE*EXPSQ (dummy variables)
RELIGION*UNV	RCUNV: RC*UNV; PROUNV: PRO*UNV; NONUNV: NONCHR*UNV; REUNV: RE*UNV (dummy variables)

* Multiply sign

earnings. Fourth, I add one dummy variable indicating the self-employed individuals. I can find whether the earnings of the self-employed are different from those of paid workers. Fifth, the paid workers who are members of union may have higher earnings since their earnings are protected and guaranteed by the organization or contracts.

To estimate the effects of religious affiliation on earnings, I divide the respondents into four groups according to their religious affiliations: Roman Catholics, Protestants, non-Christians and no religion. Then my study can focus on the differences of the returns to human capital between the groups. In addition, I include two dummy variables indicating whether the individual's father and mother were foreign-born. Thus, I estimate the "gross effects" of religion on earnings and the rate of return to human capital by controlling for some dimensions of family background.

Table 5 reports earnings regressions for the four religious groups by sex. Table 6 reports pooled regressions that permit the variables (constant, schooling, experience and its square, and "unv") to differ across the religious groups. In regressions 1 and 3, the group without a religion is the reference group. In regressions 2 and 4, Roman Catholics are the reference group. As expected, the variables schooling, experience and its square, and the log of weeks worked are important determinants of log of earnings.

In terms of the returns to males from schooling, the group without a religion ranks highest, followed by non-Christians, Protestants and Roman Catholics. The returns to the group without a religion are significantly greater than those of Catholics at the 6.4% level ($t = 2.967$)¹⁸ as shown in table 6. The returns to Protestants are

¹⁸ The null hypothesis of the t test is as follows, H_0 : the coefficient of the variable "RESCH" is zero, that is, the return to the group without a religion from schooling is the same as that of Catholics.

TABLE 5
Earning Functions for Religious Groups in Canada

	MALE												FEMALE											
	Roman Catholic			Protestants			Non-Christian			No Religion			Roman Catholic			Protestants			Non-Christian			No Religion		
	B	t		B	t		B	t		B	t		B	t		B	t		B	t		B	t	
(Constant)	6.597	30.776***		6.945	27.52***		6.136	7.448***		5.426	15.655***		6.071	25.92***		5.740	19.17***		2.798	2.708***		6.424	15.858***	
SCHOOL	0.077	6.795***		0.081	6.681***		0.120	2.715***		0.131	6.268***		0.072	4.95***		0.106	5.775***		0.201	3.458***		0.069	2.449**	
EXP	0.077	15.815***		0.062	12.9***		0.037	2.695***		0.086	8.615***		0.082	13.17***		0.067	9.178***		0.086	3.555***		0.061	5.701***	
EXPSQ	-0.001	-11.52***		-0.001	-9.872***		-0.0004	-1.331		-0.002	-6.268***		-0.002	-10.35***		-0.001	-6.798***		-0.001	-2.116**		-0.001	-3.822***	
UNV	0.103	1.758*		0.069	1.131		0.122	0.602		-0.127	-1.236		0.383	5.493***		0.259	3.173***		-0.051	-0.202		0.298	2.397**	
SELF	0.109	2.205**		0.053	1.056		0.296	2.19**		-0.223	-2.899***		-0.260	-3.166***		-0.065	-0.811		-0.002	0.008		-0.063	-0.515	
UNION	0.110	2.707***		0.008	0.174		0.137	0.921		0.079	1.119		0.212	4.372***		0.284	5.045***		0.116	0.581		0.337	4.154***	
AC	-0.254	-3.399***		-0.127	-2.221**		-0.397	-0.831		-0.117	-0.878		-0.161	-1.915*		-0.150	-1.934*		-0.026	-0.043		-0.230	-1.211	
QU	-0.198	-4.493***		-0.013	-0.151		0.212	1.011		0.042	0.441		-0.092	-1.815*		-0.216	-1.605		-0.011	-0.044		-0.331	-2.492**	
PR	0.013	-0.211		-0.044	-1.012		-0.142	-0.836		0.007	0.089		-0.105	-1.474		-0.064	-1.082		-0.193	-0.965		-0.182	-1.986**	
BC	-0.102	-1.266		-0.021	-0.376		-0.049	-0.329		0.010	0.141		0.143	1.381		-0.101	-1.576		0.184	0.845		-0.095	-1.068	
SINGLE	-0.232	-5.379***		-0.262	-5.815***		-0.202	-1.369		-0.052	-0.76		0.003	0.066		0.078	1.459		0.054	0.344		-0.031	-0.422	
FBF	0.065	0.859		0.053	0.934		-0.087	-0.369		0.017	-0.195		0.009	0.092		-0.027	-0.387		-0.057	-0.313		-0.156	-1.463	
FBM	-0.115	-1.505		-0.146	-2.574***		-0.199	-0.899		0.082	0.988		-0.111	-1.092		0.034	0.484		-0.295	-1.434		0.033	0.307	
LNWKS	0.551	12.012***		0.495	9.168***		0.606	4.07***		0.654	9.363***		0.555	12.88***		0.530	9.738***		1.012	6.182***		0.556	9.134***	
N	1117			909			118			505		999			890		87		333					
R ²	0.572			0.513			0.613			0.564		0.483			0.415		0.656		0.557					

Note: The dependent variable is the natural log of earnings LNEARN. The coefficients are reported in the "B" columns and the values of t-statistics are reported in the "t" columns.

* significant at 0.10; ** significant at 0.05; *** significant at 0.01.

TABLE 6 (All Groups Pooled)

	MALE				FEMALE			
	Regression 1		Regression 2		Regression 3		Regression 4	
	B	t	B	t	B	t	B	t
(Constant)	6.02	24.138***	6.555	38.152***	6.188	16.196***	6.018	29.906***
SCHOOL	0.121	6.632***	0.074	6.826***	0.075	2.601***	0.072	5.205***
EXP	0.088	11.151***	0.08	18.407***	0.066	6.26***	0.08	14.083***
EXPSQ	-0.002	-8.042***	-0.001	-12.877***	-0.001	-4.193***	-0.002	-10.837***
UNV	-0.104	-1.156	0.124	2.209**	0.285	2.221**	0.371	5.558***
SELF	0.019	0.629	0.02	0.65	-0.132	-2.632***	-0.132	-2.628***
UNION	0.076	2.762***	0.077	2.79***	0.251	7.729***	0.252	7.729***
AC	-0.148	-3.322***	-0.148	-3.322***	-0.161	-3.007***	-0.162	-3.013***
QU	-0.131	-4.06***	-0.128	-3.987***	-0.126	-3.168***	-0.129	-3.24***
PR	-0.016	-0.488	-0.016	-0.494	-0.098	-2.458**	-0.097	-2.433**
BC	-0.024	-0.646	-0.028	-0.74	-0.031	-0.7	-0.029	-0.648
SINGLE	-0.207	-7.389***	-0.207	-7.387***	0.021	0.686	0.022	0.698
FBF	0.046	1.161	0.045	1.128	-0.053	-1.099	-0.054	-1.103
FBM	-0.077	-1.916*	-0.076	-1.91*	-0.03	-0.606	-0.03	-0.603
LNWKS	0.552	18.145***	0.554	18.244***	0.57	19.785***	0.57	19.761***
RC	0.494	1.843*			-0.161	-0.392		
RCSCH	-0.042	-1.952*			-0.004	-0.132		
RCT	-0.009	-1.08			0.014	1.221		
RCTSQ	0.0005	2.017**			-0.0004	-1.168		
RCUNV	0.201	1.888*			0.09	0.62		
PRO	0.703	2.405**	0.16	0.705	-0.497	-1.135	-0.325	-1.11
PROSCH	-0.043	-1.859*	0.004	0.23	0.028	0.812	0.031	1.339
PROT	-0.026	-2.842***	-0.018	-2.806***	-0.0003	-0.023	-0.015	-1.686*
PROTSQ	0.001	3.277***	0.0003	2.347**	0.00008	0.239	0.0004	2.072**
PROUNV	0.191	1.659*	-0.037	-0.413	-0.002	-0.016	-0.089	-0.838
NONCHR	-0.176	-0.329	-0.715	-1.42	-1.858	-2.421**	-1.688	-2.425**
NONSCH	0.024	0.571	0.071	1.798*	0.119	1.953*	0.122	2.206**
NONT	-0.046	-3.461***	-0.038	-3.291***	0.022	0.967	0.008	0.369
NONTSQ	0.001	3.727***	0.001	2.93***	-0.0001	-0.182	0.0003	0.443
NONUNV	0.146	0.739	-0.081	-0.442	-0.298	-1.105	-0.384	-1.559
RE			-0.703	-2.603***			0.215	0.517
RESCH			0.064	2.967***			-0.0004	-0.014
RET			0.004	0.48			-0.015	-1.242
RETSQ			-0.0004	-1.511			0.0004	1.169
REUNV			-0.306	-2.84***			-0.073	-0.502
N	2666		2666		2322		2322	
R ²	0.556		0.557		0.476		0.476	

Note: The table presents pooled regressions that permit the important variables (intercept, school, exp, expsq and unv) to differ across religious groups. The dependent variable is LNEARN.

* significant at 0.10; ** significant at 0.05; *** significant at 0.01.

significantly smaller than to the group without a religion at 4.3% level ($t = -1.859$). In terms of the returns to females from schooling, non-Christians rank highest, followed by Protestants, Roman Catholics and the group without a religion. The returns to non-Christians exceed those to Catholics and the group without a religion significantly. The differences between other groups are not statistically significant.

Regarding the initial returns to experience (evaluated at “exp”=0, that is, the coefficient of variable “exp”), there is a similar pattern for males: the returns to the group without a religion exceed those to both Catholics and Protestants. However, non-Christians rank lowest in terms of the returns to experience. The returns to Protestants are significantly smaller than those to the group without a religion and those to Catholics at 2.6% and 1.8% levels ($t = -2.842$ and -2.806), respectively. The experience coefficient of non-Christians is significantly smaller than that of the group without a religion and that of Catholics at 4.6% and 3.8% level, respectively. In contrast, for females, the returns to Catholics and Protestants both exceed those to the group without a religion and the returns to non-Christians are the greatest. The returns to Catholics exceed those to Protestants at 1.5% level significantly.

The coefficients of “unv” (university degree) for males are not significant in all the groups except in the Catholics group. Although the coefficient for Protestants is imprecisely estimated, the payoff to both Catholics and Protestants from a university degree exceeds that to the group without a religion significantly. For females, the coefficients are significant for all groups except for the non-Christian group. However, the differences between the religious groups are not statistically significant. Generally, there is a positive “credential” effect on the earnings if it is significant. For the groups

with significant coefficients of “unv”, the returns from an extra year of university with a degree may be higher than without a degree¹⁹.

Comparing the constant terms for the four groups (males), I find that the intercept for the group with the highest returns to schooling and experience (the group without a religion) is the smallest, while for the Protestants who have the lowest returns to human capital the constant term is the highest. The same rule applies to females.

These results imply that the differences in earnings across the four groups vary with the levels of schooling and experience. For males, the group without a religion has the highest returns to schooling and experience. The Catholics group has higher returns to human capital than does the Protestants group²⁰. These results are contrary to what Tomes (1983) obtained.²¹ However, it is hard to compare the returns between

¹⁹ The years of schooling are sectioned to three periods: years of schooling before getting the high school diploma (BHS), years of schooling without a university degree (NDE), university with a degree (DE). The following results were obtained for various subsamples, excluding the variable “unv”:

Sample	MALE		FEMALE	
	Catholic	Protestants	Catholic	Protestants
BHS	0.031	-0.019	-0.014	-0.149
t	(0.921)	(-.475)	(-.326)	(-1.951)
NDE	0.0985	0.0705	0.094	0.058
t	(2.972)	(2.215)	(2.303)	(1.404)
DE	0.047	0.057	0.015	0.184
t	(0.983)	(1.599)	(0.277)	(3.910)

For males, the estimated returns to Protestants from the schooling years without a degree (0.0705) are significant but those of university with a degree (0.057) are not significant. That is why the coefficient of “unv” for male Protestants is imprecisely estimated. In contrast, for female Protestants whose coefficient of “unv” is significant, the returns to university graduation (0.184) are much more than the returns to the schooling years before getting a high school diploma (-0.149) while the returns to the schooling years without a university degree are not significant.

²⁰ As shown in table 6, for males, the returns to schooling for Protestants are a little greater than those of Catholics but the difference is not significant, however, the returns to experience for Protestants are smaller than those of Catholics significantly. Therefore, the returns to human capital (schooling and experience) for Protestants are smaller than those of Catholics generally.

²¹ Tomes’s empirical results are based on an analysis of the 1/100 sample of the 1971 Canadian Census. The sample is restricted to native-born white males aged 25-65. His data has more information about family background than mine (for example, ethnic origin, mother tongue). In addition, the variables urban/rural location and language, the information on which is not available in my data, are

Protestants and non-Christians. For females, the non-Christian group has the highest rate of return to human capital. Both Catholics and Protestants have a higher rate of return to human capital than the group without a religion. Between Catholics and Protestants, it is not clear whose returns to human capital are higher.

The coefficients of the variable "Lnwks" differ among the different groups significantly. For female non-Christians, the coefficient of the variable "Lnwks" exceeds one, whereas for all the other groups the coefficients are less than one, being lowest for Protestants (both males and females). The elasticity of earnings with respect to weeks worked less than one implies that the weeks-worked-earnings profiles are backward bending. The increase in earnings declines with the weeks worked. However, the weeks-worked-earnings profiles for female non-Christians are upward sloping since the elasticity of earnings with respect to weeks worked exceeds one. Tomes gives one possible explanation for the difference of the coefficients among the groups that the supply schedule of weeks worked is different. It is probably because the different groups have different holidays for the regular religious activities or festivals.

The variable "self" shows different signs in different subsamples. Self-employed males in the Roman Catholics and the non-Christian groups earn a higher premium of 10.9% and 20.6% significantly, compared to paid workers. However, the paid male workers in the group without a religion and the female workers in the Roman Catholics group earn a significantly higher premium of 22.3% and 26%, compared to the self-employed. The reasons can be "the differences in the treatment of wage and

included in Tomes's earnings equation. These differences between his estimation and mine may account for some of the differences in the results.

capital income, differences in risk and autonomy associated with alternative employment statuses” (Tomes, 1983, p.127).

Single status has a significantly negative influence on male’s earnings in the Roman Catholics and the Protestants groups. Possibly, this is because married males involve themselves more in the labour market or they have higher ability. As predicted, the coefficient of the variable “union” is positive and significant. Especially for females, the coefficients are mostly significant. Being a member of a union is more important for females than for males in terms of earnings. The last dummy variables relating to personal background are those for different regions. Some of them are significant, reflecting the different cost of living or different regional economies among the regions, as explained before. Lastly, the variables indicating foreign-born parents are seldom significant. Only for male Protestants does mother’s foreign birthplace have a negative influence on earnings.

3.4 Happiness Equations

The effects of religion on happiness are measured mainly by controlling for the background variables (age, age squared, number of children, sex, single status, employment, school and income). The effects of religious affiliation and religious attendance on the level of happiness are studied. The inclusion of the variable, religious attendance is to test whether the frequency of attending religious activities affects the level of happiness.

To compare the levels of happiness between individuals with different religious affiliations and those without religious affiliations, I first regress happiness on the

dummy variables indicating different religious denominations, the background variables, health status and stress, taking the group without a religion as the reference group. The equation is shown as follows:

$$\begin{aligned} \mathbf{Happiness} = & \beta_0 + \beta_1 \mathbf{non-Christian} + \beta_2 \mathbf{Catholics} + \beta_3 \mathbf{Protestants} + \beta_4 \mathbf{Age} + \beta_5 \mathbf{Age}^2 \\ & + \beta_6 \mathbf{Kids0-4} + \beta_7 \mathbf{Kids5-12} + \beta_8 \mathbf{Male} + \beta_9 \mathbf{Single} + \beta_{10} \mathbf{Emlpoy} + \beta_{11} \mathbf{School} + \\ & \beta_{12} \mathbf{Income} + \beta_{13} \mathbf{health} + \beta_{14} \mathbf{Stress}. \end{aligned}$$

Second, in order to compare the level of happiness between the group without a religion and the group with a religion, I regress happiness on the dummy variable indicating the group without a religion, taking all the groups with different religious affiliations as the reference group. The equation is changed as follows:

$$\begin{aligned} \mathbf{Happiness} = & \beta_0 + \beta_1 \mathbf{No religion} + \beta_2 \mathbf{Age} + \beta_3 \mathbf{Age}^2 + \beta_4 \mathbf{Kids0-4} + \beta_5 \mathbf{Kids5-12} + \\ & \beta_6 \mathbf{Male} + \beta_7 \mathbf{Single} + \beta_8 \mathbf{Emlpoy} + \beta_9 \mathbf{School} + \beta_{10} \mathbf{Income} + \beta_{11} \mathbf{health} + \beta_{12} \mathbf{Stress}. \end{aligned}$$

All the results are shown in table 7.

Comparing the effects of religious affiliation on happiness, I observe weakly significant differences of happiness among different groups. The happiness of males without religious affiliations is less than that of those with religious affiliations, but this effect is insignificant. Only the females who are Protestants are happier than are those without a religion with a level of statistical significance. Thus, females can feel happier than males when they have religious affiliations.

Table 7 reveals that there is a U-shaped effect on happiness with respect to age. For males, “happiness” is lowest at the age of 47; for females, it is at the age of 55. The negative coefficient of the variable “male” implies that males are less happy than females generally. One possible explanation is that males face more work related

TABLE 7
Regressions of Happiness for All Respondents

	ALL			MALE			FEMALE					
	B	t		B	t		B	t				
(Constant)	3.797	47.795***	3.8	48.513***	3.876	35.029***	3.879	35.419***	3.592	32.382***	3.591	33.049***
NON-CHRISTIAN	-0.031	-0.868			-0.048	-1.037			-0.006	-0.117		
CATHOLIC	-0.019	-0.931			-0.016	-0.589			-0.016	-0.512		
PROTESTANTS	0.067	3.114***			0.036	1.241			0.102	3.172***		
NO RELIGION			-0.018	-0.919			-0.013	-0.521			-0.026	-0.891
AGE	-0.022	-8.073***	-0.022	-8.107***	-0.032	-7.984***	-0.032	-8.025***	-0.012	-3.263***	-0.012	-3.232***
AGE SQUARED	0.0002	7.369***	0.0002	7.499***	0.00034	7.773***	0.00034	7.843***	0.00011	2.559**	0.00011	2.642**
KIDS 0-4 NO.	0.036	2.205**	0.035	2.141**	0.028	1.249	0.028	1.249	0.047	1.901*	0.045	1.811*
KIDS 5-12 NO.	-0.003	-0.263	-0.003	-0.29	-0.015	-0.914	-0.016	-0.966	0.010	0.578	0.010	0.612
MALE	-0.073	-4.767***	-0.077	-5.052***								
SINGLE	-0.197	-11.533***	-0.198	-11.548**	-0.208	-7.866***	-0.208	-7.866***	-0.179	-7.848***	-0.180	-7.859***
EMPLOY	0.041	2.009**	0.044	2.17**	0.096	3.184***	0.098	3.234***	-0.005	-0.174	0.001	0.02
SCHOOL	-0.0019	-0.592	-0.0014	-0.43	-0.008	-1.898*	-0.009	-1.951*	0.007	1.437	0.009	1.785*
INCOME	1.63E-06	4.361***	1.75E-06	4.654***	2.13E-06	4.422***	2.22E-06	4.608***	6.87E-07	1.082	8.14E-07	1.278
HEALTH STATUS	0.127	18.316***	0.127	18.299***	0.138	14.247***	0.138	14.249***	0.114	11.43***	0.114	11.337***
STRESS	-0.118	-16.591***	-0.118	-16.614***	-0.113	-11.595***	-0.113	-11.6***	-0.121	-11.65***	-0.123	-11.754***
N	6731		6731		3366		3366		3364		3364	
R ²	0.133		0.129		0.151		0.15		0.122		0.114	

Note: Non-Christian, Catholic, Protestants, No religion, male, single, employ = dummy variables that equal "1" if an individual's religious denomination is non-Christian, or Roman Catholic, or Protestants, or no religion, or if an individual is male, or single, or employed. The group without a religion is the reference group for the first regressions. The groups with different religions are the reference group for the second regressions.

* significant at 0.10; ** significant at 0.05; *** significant at 0.01.

pressure than females do in Canada. Females feel happier for having more preschool-age children but for males, the effect of the number of preschool-age children is not significant. However, having school-age children is not associated with happiness. Married people are happier than the single people. Being employed is more important for males than females since it makes males happier than does being unemployed, however, there is no significant relationship between employment and happiness for females.²²

The sign of the variable “school” is negative for males and positive for females. Highly educated males show less happiness than lowly educated ones but highly educated females show more happiness than lowly educated ones. One possible explanation is that on the one hand, people with a high level of education can have more choices in jobs or have higher life quality than others, leading them to feel happy. On the other hand, people with a high level of education often aspire for better jobs or higher life quality, leading them to feel depressed.²³ The two effects may counteract each other. Thus, we may get different signs of school.

The variable “income” is the individual’s personal income per year. It includes not only the income from employment but also other income from pension, investment, etc. The effect of income is statistically significant for males and is positively correlated with happiness. Nevertheless, it is not significant for females. As predicted, good health increases happiness, while stress reduces it.

²² When the happiness of single women is regressed on all the variables except the dummy variable indicating marital status, joblessness has a significant influence on the level of happiness of single women.

²³ Clark and Oswald (1994) obtains the same result that the highly educated individuals show more distress than others.

To compare happiness among the groups having religious affiliations, I add religious attendance into the equations because the variable is available only for people with religious affiliations. The equations are as follows:

$$\begin{aligned} \text{Happiness} = & \beta_0 + \beta_1 \text{non-Christian} + \beta_2 \text{Catholics} + \beta_3 \text{Attendance} + \beta_4 \text{Age} + \beta_5 \text{Age}^2 \\ & + \beta_6 \text{Kids0-4} + \beta_7 \text{Kids5-12} + \beta_8 \text{Male} + \beta_9 \text{Single} + \beta_{10} \text{Emlpoy} + \beta_{11} \text{School} + \\ & \beta_{12} \text{Income} + \beta_{13} \text{health} + \beta_{14} \text{Stress}, \text{ or} \end{aligned}$$

$$\begin{aligned} \text{Happiness} = & \beta_0 + \beta_1 \text{Catholics} + \beta_2 \text{Protestants} + \beta_3 \text{Attendance} + \beta_4 \text{Age} + \beta_5 \text{Age}^2 + \\ & \beta_6 \text{Kids0-4} + \beta_7 \text{Kids5-12} + \beta_8 \text{Male} + \beta_9 \text{Single} + \beta_{10} \text{Emlpoy} + \beta_{11} \text{School} + \beta_{12} \text{Income} \\ & + \beta_{13} \text{health} + \beta_{14} \text{Stress}. \end{aligned}$$

The results are shown in table 8. In the specifications R(1), R(3), R(5), the Protestants group is the reference group, and in the other three regressions, the non-Christian group becomes the reference group.

The results show that the Protestants group is the happiest group. Moreover, the happiness of Protestants exceeds that of Catholics and non-Christians significantly, especially for females. The difference of happiness between Catholics and non-Christians is not significant. The frequency of religious attendance has a positive impact on the level of happiness for males, although the impact is weakly significant. The results imply that the religious activities do have a positive influence on the individuals' happiness.

The other variables except the variable "Kid 0-4 No." show the same effects on happiness as they do in table 7. In table 8, it can be seen that the effect of the number of preschool-age children is weakly significant for males but not for females. Having more preschool-age children makes males who have religious affiliations happier.

TABLE 8
Regressions of Happiness for Individuals with Religion

	ALL			MALE			FEMALE					
	R (1)		R (2)		R (3)		R (4)		R (5)		R (6)	
	B	t	B	t	B	t	B	t	B	t	B	t
(Constant)	3.823	43.672***	3.724	40.542***	3.968	32.031***	3.881	29.845***	3.544	29.473***	3.442	27.358***
NON-CHRISTIAN	-0.1	-3.005***			-0.089	-2**			-0.102	-1.991**		
CATHOLIC	-0.086	-5.32***	0.013	0.409	-0.055	-2.359**	0.034	0.78	-0.114	-5.067***	-0.013	-0.248
PROTESTANTS			0.099	2.996***			0.088	1.999**			0.102	1.991**
ATTENDANCE	0.0007	1.952*	0.0007	1.949*	0.001	1.708*	0.001	1.705*	0.0006	1.128	0.0006	1.128
AGE	-0.022	-7.274***	-0.022	-7.28***	-0.033	-7.576***	-0.033	-7.584***	-0.0104	-2.557**	-0.0104	-2.557**
AGE SQUARED	0.0002	6.634***	0.0002	6.639***	0.00034	7.274***	0.00034	7.281***	0.00009	2.064**	0.00009	2.064**
KIDS 0-4 NO.	0.039	2.146**	0.039	2.144*	0.043	1.691*	0.043	1.689*	0.035	1.31	0.035	1.31
KIDS 5-12 NO.	-0.011	-0.898	-0.011	-0.899	-0.021	-1.214	-0.021	-1.215	0.0007	0.039	0.0007	0.039
MALE	-0.072	-4.304***	-0.072	-4.298***								
SINGLE	-0.199	-10.552***	-0.198	-10.549***	-0.202	-6.816***	-0.202	-6.814***	-0.184	-7.437***	-0.184	-7.437***
EMPLOY	0.053	2.373**	0.053	2.378**	0.103	3.134***	0.104	3.139***	0.008	0.276	0.008	0.276
SCHOOL	-0.0004	-0.124	-0.0004	-0.128	-0.011	-2.288**	-0.011	-2.293**	0.014	2.664***	0.014	2.664***
INCOME	1.36E-06	3.283***	1.35E-06	3.28***	2.24E-06	4.172***	2.24E-06	4.17***	-1.23E-07	-0.179	-1.23E-07	-0.179
HEALTH STATUS	0.132	17.228***	0.132	17.227***	0.139	12.821***	0.139	12.82***	0.123	11.378***	0.123	11.378***
STRESS	-0.12	-15.45***	-0.12	-15.45***	-0.114	-10.473***	-0.114	-10.47***	-0.126	-11.24***	-0.126	-11.24***
N	5647		5647		2749		2749		2897		2897	
R ²	0.15		0.15		0.171		0.171		0.14		0.14	

Note: Non-Christian, Catholic, Protestants, male, single, employ = dummy variables that equal "1" if an individual's religious denomination is non-Christian, or Roman Catholic, or Protestants, or if an individual is male, or single, or employed. Protestants are the reference group in R(1), R(3) and R(5); Non-Christians are the reference group in R(2), R(4) and R(6). Attendance = the frequency of religious attendance.
 * significant at 0.10; ** significant at 0.05; *** significant at 0.01.

4. CONCLUSIONS

This paper has examined the correlates of the frequency of religious attendance, the differences across religious groups in the rate of return to human capital, and the effect of religion on happiness, using data from the 1998 GSS.

The main empirical findings for the religious attendance equations are: (1) The age-religious-attendance profiles are U-shaped with a minimum at the age of around 35, in 4 cases (all Catholics, all Protestants, male Catholics and female Protestants). Only for the male Protestants group does the religious attendance have no significant relation with age. In the other cases, the religious attendance increases with age strictly. (2) The slopes of age-religious-attendance profiles for females are steeper than males. (3) The religious attendance is negatively correlated with the wage income. (4) The religious attendance of Roman Catholics and Protestants presents opposite patterns by sex, with respect to wage income. Among Roman Catholics, the males' wage income reveals no significant relation with their religious attendance. However, the females' wage income affects their religious attendance significantly. In contrast, for Protestants, the coefficient of males' wage income is significant but that of females' is insignificant. The following table summarizes the effects of the major explanatory variables on religious attendance.

Religious Attendance		Effect of Age	Effect of Wage Income	Effect of Hours Worked
Male	Catholics	U-shaped	Zero effect	Negative
	Protestants	Zero effect	Negative	Negative
Female	Catholics	Positive	Negative	Zero effect
	Protestants	U-shaped	Zero effect	Negative

The main empirical findings for the differences of the returns to human capital among the religious groups are: (1) For males, the returns to the group without a religion from schooling and experience are higher than they are for Catholics and Protestants. The returns to Catholics exceed those of Protestants. For females, the non-Christian group has the highest rate of return to human capital. Both Catholics and Protestants have higher rates of return to human capital than the group without a religion. (2) The “credential effect” of a university degree for males who are Protestants, non-Christians or have no religion is zero, whereas for male Catholics, the possession of a degree is associated with 10.3 percent higher earnings (holding other variables constant). The “credential effect” of female non-Christians is zero, whereas for other females the possession of a degree is associated with over 25 percent higher earnings on average. The following table summarizes the signs of the effects of schooling, experience, university degree and log of weeks worked for different groups.

Natural Log of Earnings		Effect of Schooling	Effect of Experience	Effect of University Degree	Effect of Natural Log of Weeks Worked
Male	Catholics	Positive	U-shaped	Positive	Positive
	Protestants	Positive	U-shaped	Zero effect	Positive
	Non-Christian	Positive	Positive	Zero effect	Positive
	No Religion	Positive	U-shaped	Zero effect	Positive
Female	Catholics	Positive	U-shaped	Positive	Positive
	Protestants	Positive	U-shaped	Positive	Positive
	Non-Christian	Positive	U-shaped	Zero effect	Positive
	No Religion	Positive	U-shaped	Positive	Positive

Comparing the first finding with those of Tomes (1986), there are some important differences. Tomes finds that male Protestants have higher returns to human capital than male Catholics but I find the converse is true. From his findings, Tomes

concludes that the higher rate of return on human capital leads to higher earnings and greater investments in schooling. However, from table 1 reporting the sample means for the subsamples, the male Protestants have higher earnings and more years of schooling than male Catholics. The higher rate of return on human capital does not lead Catholics to have higher earnings and greater investment in schooling. Tomes also argues that the low rate of return on human capital leads Catholics to have larger size families. From my findings, I can not draw such a conclusion. Probably, the hypothesis mentioned before is true, showing that because Catholic families have more children than others, due to the “quality-quantity” trade-off linkage, they make less investment per child, receiving a higher rate of return on their investments.

The results from estimating happiness equations show that religious activities do affect the happiness of individuals. Compared with the women who have no religion or have other religious affiliations, the female Protestants are the happiest group. For individuals who have a religious affiliation, the frequency of religious attendance affects the happiness of men positively. The Protestants are still the happiest group among the groups with religious affiliations. Their levels of happiness exceed those of Catholics and non-Christians, and the discrepancies are statistically significant. The results are summarized in the following table.

Happiness	Effect of Protestants*	Effect of Religious Attendance	Effect of Age	Effect of Employment	Effect of Income	Effect of School
Male	Positive	Positive	U-shaped	Positive	Positive	Negative
Female	Positive	Zero effect	U-shaped	Zero effect	Zero effect	Positive

* The dummy variable indicating the Protestants group when equal to “1”

The results suggest that the three estimations are all strikingly different between males and females. Sometimes, they are contrary. In the finding (4) from the first equation estimation, the effects of wage income on religious attendance are opposite for males and females. In the finding (1) from the second equation estimation, the returns to the group without a religion from human capital rank highest for males but lowest for females. In the findings from the third equation estimation, the income and employment affect males' happiness significantly but affect females' insignificantly.²⁴ The variable "school" shows opposite signs for men and women. The increasingly important segment of the labor force and the possibility that sexual division of labor may differ significantly between religious groups may be the causes of the above different patterns for men and women.

All the findings from this paper show that religious beliefs and activities are closely correlated with the individuals' economic status and behaviours. They do interact with each other. However, the lack of the variables related to religion (the belief in after-life, spouse's and parents' religious beliefs, and religious attendance for all respondents) and family background (parents' income and education) in the data does not enable us to analyze the interaction more exactly by controlling for these variables.

²⁴ This is consistent with the labor supply literature, which discerns very different patterns for men and women.

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