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The effect of income on religiosity

Comparing individuals in the Netherlands

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Religion is an important factor that influences decisions. Researches predicted that income plays a significant role in this process and religiosity. In this paper an empirical research on the relationship between income and religiosity among Dutch individuals is conducted. Using data from the LISS panel on around 4000 individuals in the Netherlands between 2007 and 2012, the effect of income on church attendance and praying frequency has been measured. The relationship is tested against the plausible effect of region and education and unemployment is used to discover a causal effect. Outcomes show that, against expectations from theories and other researches, income is a poor prediction of religiosity.

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Introduction

Religion, in this work, is defined as believing in a god or a group of gods and following the rules that come out of that belief. Since religion determines how people make decisions, it has been and still is an important and interesting factor in many sciences, including economics. Many religions bring the attention to welfare, money and how to spend your income. The clearest example can be found in back in Christianity, the main religion in the Netherlands. The Bible, the Holy Book of the Christians, writes about money in 1 Timothy 6:9-10: "People who long to be rich fall into temptation and are trapped by many foolish and harmful desires that plunge them into ruin and destruction. For the love of money is the root of all kinds of evil. Some people, craving money, have wandered from the true faith and pierced themselves with many sorrows." The Bible here focusses on the sorrows and constant dissatisfaction that comes with having a lot of money. The love for money will get in the way for the love for God. Or as the Bible says in Luke 16:13: "You cannot serve both God and money".

Indeed, a lot of researches have shown a negative correlation between income and religiousness. In the last couple of years, a lot of attention has been drawn to the influence of economic development on secularization, the decline of the social significance of religion, in developed countries. This religion-market model, in which economic growth is stated as a cause of secularization was introduced by Weber (1930) and further confirmed by other researches (Barro & McCleary, 2006; Strulik, 2015). Another research done in the United States by Lipford and Tollison (2002) shows that high incomes discourage religious participation, measured in church attendance frequencies.

However, it can also be argued that it is easier to serve God when you have a lot of money. Also this statement can be based on the Bible, since it is stated there that ten per cent of all goods you own should be given to God.[1] This is interpreted as giving at least 10 per cent of your income to the church. Even though this rule has been relaxed over years, it can be concluded that having more income also can benefit the church and religiousness. This idea is supported by a paper by Thomas Buser (2014), who showed that an exogenous shock in income led to a significant increase in church attendance and participation in religious activities.

Combining these different theories, the research question of this paper will be:

[1] Leviticus 27:30-31 from the Bible

"What is, if any, the relationship between income and religiousness in the Netherlands between 2007 and 2012?"

Past researches mainly focus on the effect of economic growth on religion on a cross country level and show differences between religiousness in developed and non-developed countries. They argue that the economic situation in a country affects the influence of the church (Franck, 2007). This research contributes to the debate on the relation between income and religion since it focusses on the correlation on an individual level. Comparing individuals with different incomes over time in a developed country, the Netherlands, in a time where the national economic situation was worsening due to the Financial Crisis, the true individual relation between income and religion may be examined. In contrary to some important researches, the empirical research in this study shows that income is a poor predictor of religiosity.

This paper is will start off with a theoretical framework, based on a model by Azzi and Ehrenberg (1975). After discussing the used data and the measures used, the basic regression is presented. Next, the correlation will be controlled for the effect of region and education. After these regressions, the different sources of income will be evaluated in the discussion section after which a conclusion will be drawn.

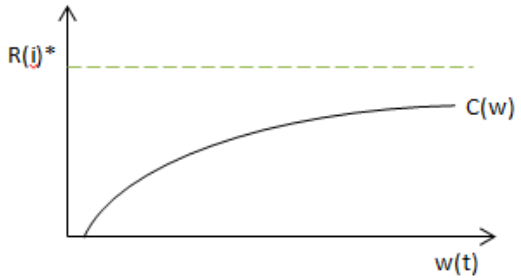
Theoretical framework

In order to estimate the relation between income and religion, there need to be a clear definition of religion and how it will be measured. In this work, religion is defined as believing in a God or a group of gods and following the rules that come out of it (Meriam-Webster, 2015).

Religion can be explained as an identity. According to Akerlof and Kranton (2010), an identity is a person's sense of self, which affects economic outcomes since preferences and individual utility are identity specific (Akerlof & Kranton, 2010). Religion, as identity, is thus an important determinant of the way people make decisions. This idea is backed up by many researches on the influence of religion on consumption choices (Vitell, Paolillo, & Singh, 2005), relations (Marks, 2005), risk attitudes (Shinha, Cnaan, & Gelles, 2007) and many more choices.

According to a recent study by Strulik (2015), religion also affects decisions that have to do with income. According to his study, people with a religious identity tend to gain less utility from consumption, since they believe excessive consumption will keep them from true faith (Strulik, 2015). According to his theory, since as wages rise, consumption increases in a concave

shape. Since people with a religious identity tend to gain less utility of consumption, they will only choose for a religious identity as long as the extra utility they gain from being religious is bigger than the utility they lose of the constraint they put on consumption. This idea is represented in the *graph* below.



Graph 1. *Concave shape of consumption and the negative impact of income on religion* (Strulik, 2015).

What are the factors in religion or spending time in religious activities that bring utility to individuals? According to Azzi and Ehrenberg (1975), there are three main reasons to be religious: First, individuals may relate their time spent in religious activities to their afterlife consumption (i.e. going to heaven), which is called the "salvation motive". Second, they derive current satisfaction from religious activities because of their beliefs and social reasons, called "the consumption motive". Third, they may feel pressured by the environment or have the idea that participation in religious activities will increase the probability of success in business, called the "social-pressure motive" (Azzi & Ehrenberg, 1975).

In this work, religiosity is measured in how often people go to church and how often they pray. For church attendance, the reasons individuals attend religious gatherings come down to the drivers Azzi and Ehrenberg (1975) described. This can be seen in more recent outcomes of a questionnaire on church attendance by Newport (2007). Outcomes of showed that the consumption motive is a big driver of going to church: 13 per cent says to go to church for the fellowship of other members (Newport, 2007). However, the main driver that 23 per cent of the respondents mentioned was "spiritual growth and guidance", which has to do with the salvation motive since growing in faith will contribute to their afterlife. Even more interesting are the reasons people gave for not going to church. Around 21 per cent of the respondents indicated not to go to church because they do not have time for it (Newport, 2007).

However, talking about time spent in religious activities, not only going to church is important. According to the DUREL (2010) method of religiosity, church attendance is only an external way of defining religiosity. Therefore, this work also looks at the internal religiosity or how you personally express your religiosity (Koenig & Büssing, 2010). Adding praying as a determinant of religiosity is also important, since only a few researches have focused on this aspect of religiosity in the relation with income. Praying is defined as human communication with divine and spiritual entities (Gill, 2005). As for church attendance, one of the main reasons people don't pray often is because they are too busy with their daily lives and forget about it. Or, as a famous saying goes "the habitual difficulty in prayer is distraction". It thus seems as if religiosity has to do with a time allocation problem, which can be related to income in the economic model presented in the following section.

An economic model

As we saw before, being religious gives individuals some happiness, consisting of the utility they receive from their salvation, but also from current consumption and social benefits. Even though it is said that income does not bring happiness, income is often found to be correlated with utility through consumption (Heady, Muffels, & Wooden, 2007). Therefore, in order to create an economic model, let's assume an individual with the following utility function (Azzi & Ehrenberg, 1975):

$$U_i = U(C_1, s_1, C_2, s_2, \dots C_n, s_n, q)$$

Where *Ui* stands for the utility function of individual *i* and *C* for the level of consumption in period t. The letter *s* stands for the consumption value of religious participation and the letter *q* stands for the expected value of the afterlife consumption[2]. Following the theory by Azzi and Ehrenberg (1975), this paper assumes that an individual already gains some utility in this life for a high expected value of afterlife consumption. For this model, it is assumed that the individual knows the length of its life namely that it will and at the end of period *n*.

[2] Assuming that one's view of afterlife on earth is not either heaven or hell, but an expected present value of a range of possible outcomes. This because religious individuals do not believe they will go to heaven by going to church, but they will give it more value if they spend more time doing church related activities. Therefore, here on earth, the value is assumed not to be infinitive.

Consumption in period t, assumed to be the same each period, depends on the production-function transforming the purchases of market goods (*xt*) and the time the individual allocates to consumption (*ht*):

$$C_t = C(x_t, h_t)\ for\ all\ t$$

Current and afterlife consumption of religion is assumed to be dependent on the time spent in church related activities, such as going to church and praying, in all periods during their life. Of course, for individuals with a non-religious identity this will be equal or close to zero since they do not value their time in religious activities:

$$q = q(r_1, r_2, \dots, r_n) \quad \text{and} \quad s_t = s_t(r_t) for\ all\ t$$

Letting *p* denote the price of market goods in any time period, *w* the wage per hour and *lt* the number of working hours in each period, the income constraint of an individual can then be presented as followed:

$$\sum_{t=1}^{n} \frac{px_t}{(1+i)^{t-1}} = \sum_{t=1}^{n} \frac{w_t l_t}{(1+i)^{t-1}}$$

It simply shows that how much we can consume is dependent on our incomes (wage times the number of hours worked).

To present the fact that people do not go to church because it takes up to much time, let us assume that each individual faces the following time constraint, with T as the total number of hours in a period:

$$T = h_t + r_t + l_t$$

The past statements create a utility maximization problem with a time and income constraint, which can be written down as the following Lagrangian function[3]:

$$L = U[C(x_1 h_1), \dots, C(x_n h_n), q(r_1, \dots r_n)] + \lambda\left(\sum_{t=1}^{n} \frac{px_t}{(1+i)^{t-1}} - \sum_{t=1}^{n} \frac{w_t(T - h_t - r_t)}{(1+i)^{t-1}}\right)$$

This model of Ehrenberg (1975) shows that the number of hours devoted to church related activities increases with age. The reason for this is that in contrast to the investment theory, it is optimal to concentrate investments in the early stages of your life because of their returns in later years, in religion it is best to "invest" in later years. This is because expected returns will not be generated until the end.

[3] More mathematical explanation and proofs can be found in the appendix by Ehrenberg (1975) as can be found in the bibliography

However, solving the maximization problem, the following solution can be obtained:

$$\frac{\frac{\partial U}{\partial s_t}\frac{\partial s_t}{\partial r_{it}} + \frac{\partial U}{\partial q}\frac{\partial q}{\partial r_{jt}}}{\frac{\partial U}{\partial s_{it-1}}\frac{\partial s_{t-1}}{\partial r_{it-1}} + \frac{\partial U}{\partial q}\frac{\partial q}{\partial r_{it-1}}} = \frac{w_{it}}{w_{it-1}}(1+i)^{-1}$$

Assuming that the salvation motive is more important than the consumption motive, this equation shows that the more rapid the rate of wage increases, the smaller the rate will be at which hours devoted to church related activities will increase with age. It shows that income has a negative influence on the amount of time individuals allocate towards church related activities (Azzi & Ehrenberg, 1975). Therefore the first hypothesis of this paper will be:

An increase in income will lead to a decrease in time allocated to religious activities

In the model, we did not add the social-pressure motive to spend time on religious activities. This is because the social-pressure motive only holds for external religiosity. People can go to church because they have to or because they want to show their religiousness out of social-pressure motives without being religious. The social-pressure motive will thus make it more likely to spend time in external religious activities such as going to church than internal religious activities. It can be expected that income will thus have a bigger effect on internal religiousness since you then it are just your own desires that count. The expected bigger effect of income on internal religiosity can be underwritten by the reasons why we pray. Usually, a praying individual will ask God for help in its everyday life. Praying thus makes you (feel) dependent on God. Having a lot of income, you do not have to ask God for many things, since you can simply buy everything you need yourself. Because of these reasons, the second hypothesis will be:

An increase in income will lead to a decrease in internal religious activities which is relatively bigger than the decrease in external religious activities.

Data

Both hypotheses have been tested using data from questionnaires done by the LISS (Longitudinal Internet Studies for the Social sciences) panel. This is a panel consisting of 8000 individuals, who have to complete online monthly questionnaires. The 8000 individuals are based on a true probability sample of households drawn from the population register by Statistics Netherlands (LISS, 2015). The advantage of this panel is that the answers of the same group of

people can be examined over time and that this panel is a good representation of the Dutch population. Also, since religion can be seen as an identity, a person's sense of self, it can best be measured by how someone sees his own religiousness. Therefore, the research question has been answered using observable data from this LISS panel survey.

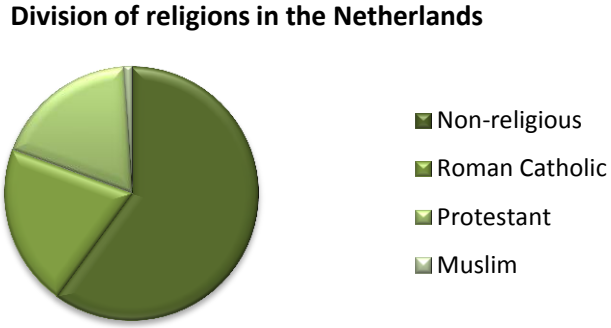
In order to answer the research question, data on income has been collected for the six latest waves of questionnaires consisting of annually given answers to the same questionnaire on income for the years 2008 until 2013. These surveys have been held in the month June for each year and give information about the individual's income in the previous year. This means, a questionnaire held in June 2013 will give information about the individual's income in 2012.

Next to the questionnaire on income for the period between 2008 and 2013, data is used from an annual questionnaire on religion which was held in the same six years. The questionnaire on religion was held in January for each year. Making the assumption that both questionnaires are capturing the state of income and religiousness in the year before the questionnaire was held, the data can be merged. Doing this, we can estimate the relation between income and religion for the years 2007 until 2012. Merging this dataset again with longitudinal questionnaires on the background of the participating individuals, the role of region and leisure time can also be examined.

Data description and methodology

Taking all the information of religion and income for all individuals for the years between 2007 and 2012, information for 7706 individuals could be obtained. However, many respondents to the LISS questionnaires indicated not to know their annual net income. After removing those individuals that could not indicate their income in all six years, including outliers, usable information for 3295 individuals remained. Out of these 3295 individuals, around on average 1120 individuals considered themselves member of a religion or church. The division of religion among the sample has been found to remain stable over the six years. Around 60 per cent did not consider themselves religious. The remaining 40 per cent was namely divided in 20 per cent Roman Catholics, 1 per cent Muslims and 18 per cent Protestants. In this paper, being "Protestant" is defined as being a member of the reformed Christian Church which rose as a countermovement against Catholicism in the 16h century (Cambridge Dictionary). It contains members of the Dutch Protestant Church (PKN), Dutch Reformed church (Nederlands

Hervormde kerk), Reformed Churches in the Netherlands (Gereformeerde Kerk) and Evangelical and Pentecostal churches. The other two per cent of the sample is filled with other religions such as Muslims, Buddhists, Humanists and Hindus. These numbers are consistent with data from the CBS, showing that in 2013 in the Netherlands, around 53 per cent considered themselves to be non-religious, 26 per cent Catholic and 16 per cent Protestant (CBS, 2014). The LISS panel is thus indeed a good representation of the Netherlands.



In the LISS panel data, income is measured in different ways. For the purpose of this paper, the focus will lie on the estimated net income over the year. This measures an individual's income after several credits and income tax are deducted (Skinner, 1999) The advantage of using net income is that it accounts for the different money deductions people have to take into account, so it gives a better image of the income an individual really can use for consumption. Income will thus be measured by the question: "What was total net income of your household over the period from 1 January *year* to 31 December *year*". Over these years, average income lay around €34,000. This income per household is a good representation of the Netherlands considering statistics obtained by the CBS, showing that the mode of net disposable income for households in the Netherlands lied around €33,000 for those six years (CBS, 2014).

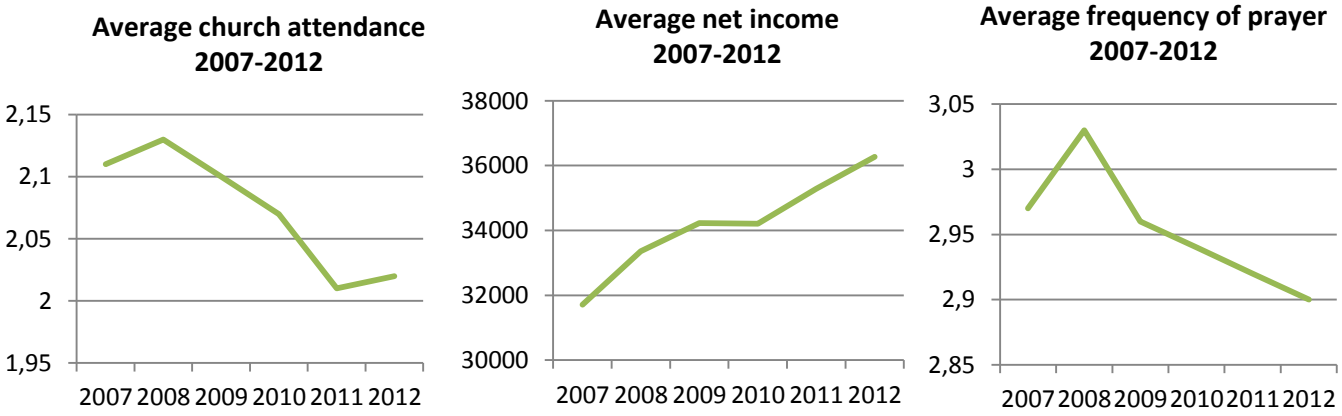
To compare this income with religiousness, it is important to find a good indicator of religion. Most researches on religion agree that for Christians, church attendance is a good measure of religiosity (Brierley, 1999; Bruce, 2011). Using church attendance as a measure of (external) religiosity, religiousness will be measured by the answers to the question: "Aside from special occasions such as weddings or funerals, how often do you attend religious gatherings nowadays?" The answers to this question are scaled from 1 to 7, where '1' stands for going never going and '7' for going to a religious gathering every day. As can be seen in table 1, the average

response lies around the number '2', which stands for going "less often" than just on religious days to a religious gathering:

How often do you attend religious gatherings?	*4 = at least once a month*
1 = every day	*5 = only on special religious days*
2 = more than once a week	*6 = less often*
3 = once a week	*7 = never*

Besides measuring church attendance as external religiosity, internal religiosity will be measured by the question "Aside from when you attend religious gatherings, how often do you pray?" Prayer is the most recognized and most frequently utilized form of religious expression and is therefore a good complementary measurement of religiosity (Levin & Taylor, 1997). The answers to the question are scaled in the same way as for attendance to religious gatherings, where the average answer lies around the number '3', which stands for praying once a week.

In the *graphs* shown below, it can be observed that the average net income for all used participants of the panel have been increasing over the six years. Attendance to religious gatherings and the frequency of how often one prays, however, has been decreasing over the six years. It seems as though indeed, income is negatively correlated with church attendance and frequency of prayers in the Netherlands. This will be tested in the following section using a linear regression model.



Graph 2 *– Average net income and internal and external religiosity in the Netherlands between 2007 and 2012*

The following section will start with a basic linear regression on income and attendance to religious gatherings and a similar regression on income and how often one prays. After that, the relation will be analyzed further by adding several different factors that might have altered the results.

The Basic Regression

In order to estimate the relation between income and religiosity, first a basic regression between net income and church attendance is made over the years 2007 until 2012. Annual net income and attendance to religious gatherings are standardized in order to obtain a meaningful result.

$$Church\_Attendance_{it} = \alpha_i + \beta_1 Net\_Income_{it} + \gamma_t + X_{it} + +\varepsilon_{it}$$

Without including any year or individual effects, the raw effect of net income on how often one goes to church is significantly negative. The outcome shows that if annual net income would be to increase with 10,000 euros, church attendance will decrease with 0.95 per cent. It seems as if whether you attend religious gatherings is weakly negatively correlated with income.

However, the effect is not that strong and the low R squared value indicates that the model does not fit the dataset very well. Therefore, year specific and individual specific dummies have been included in the model. The reason for this is that there might be some differences between the years that have influenced the observed correlation between net income and how often one attends a religious gathering. Also, researches have shown that females tend to be more religious than men (Miller & Hoffman, 1995) and that individuals with a higher IQ tend to be less religious (Albrecht & Heaton, 1984). Effects like these are captured in the fixed individual dummies added to the model.

In *table 1* can be seen that the effect adding both the year and individual specific effects, increased the goodness of fit of the model, but decreased the significance and magnitude of the correlation.

ChurchAtt.	*Coef.*	*p<[t]*	R^2	*Coef.*	*P<[t]*	R^2	*Coef.*	*P<[t]*	R^2
Net Income	-.0308	(0.003)	.001	-.0305	(0.003)	.002	.0013	(0.802)	.925
Year FE		NO			YES			YES	
Individual FE		NO			NO			YES	

Table 1 *– Regression outcome of income on church attendance in the Netherlands (2007-2012)*

By these results, it seems as though whether you go to church is mostly influenced by individual specific effects. The effect of income on church attendance now turned positive and it seems as though with this basic regression, the hypothesis that income has a negative influence on attendance to religious gatherings cannot be rejected.

The same process has been followed in order to determine the effect of income on how often one prays:

$$Praying\_Freq_{it} = \alpha_i + \beta_1 Net\_Income_{it} + \gamma_t + X_{it} + \varepsilon_{it}$$

The results of the regressions can be found in *table 3*. The raw effect of income on how often you pray seems to be bigger than for church attendance. When a household's net income would be to increase with 10,000 euros, it would decrease the amount of times one prays by 2 per cent. As for church attendance, the fixed year and individual specific effects were added to the model. However, even though it decreased in magnitude, the effect of net income on how often one prays remained significant (p=0.046). Testing this model for robustness showed that the goodness of fit remained also for this model.

Praying	*Coef.*	*p<[t]*	R^2	*Coe.*	*P<[t]*	R^2	*Coef.*	*P<[t]*	R^2
Net Income	-.0580	(0.000)	0033	-.0588	(0.000)	.0038	-.0093	(0.046)	.936
Province FE		NO			YES			YES	
Year FE		NO			NO			YES	

Table 2 *– Regression outcome of income on praying frequency in the Netherlands (2007-2012)*

Even though there seems to be a negative effect of income religiosity, the effect turned either insignificant or very small in magnitude when adding the person specific effects. The reason for this may be that there is little variation in income over the years per individual or that after introducing the person specific effect, not many more data points are left. Looking more into income changes of individuals over the years, this did not seem to be the case, as can also be seen in *Appendix 1*.

In *graph 2*, as shown before, one can see an increase in religiosity in the year 2008 which is mainly visible in praying frequencies. Outcomes of the linear regression show that nevertheless, this increase in 2008 is insignificant and thus no further attention will be drawn to it. Despite this, the years 2010, 2011 and 2012 all showed a negative effect on both church attendance and praying frequencies, as can be seen in *Appendix 2A.* Graph 2 thus showed a correct image of a decrease in religiosity over the years, indicating secularization is also visible in the Netherlands. However, it is not that clear that the secularization is caused by the increase in income, but rather by a combination of year and person specific effects.

Differences between religions

The idea that income negatively influences religiosity is backed up by a recent theory of Strulik (2015), However, he argues that the degree in which income influences religiosity depends on your religion (Strulik, 2015).

Showing this in our utility function, it will change as followed:

$$U_i = U(aC_1, s_1, aC_2, s_2, \dots aC_n, s_n, q)$$

This shows that how much utility one gets from consumption depends on the parameter α, which allows for differences between religions. Religions which require a very sober life will have a smaller α, and thus gain less utility from consumption than religions with a bigger α, which are less strict on living a wealthy life. According to previous researches, this parameter is smaller for Protestants, since they relate excessive consumption or income with a decrease in faith and with sin (Abela, 2007; Strulik, 2015). Therefore the expectation is that the negative effect of income on time allocated in religious activities is relatively bigger for Protestants. In contrary, Muslims do not seem to draw such a negative attention to excessive consumption or income. Verses from the Quran show that Muslims even need to focus on spending their money in this life, but in the way of Allah, since it will not be of any use after life[4]. Also Roman Catholics are less likely to put a negative stamp on income since the Roman Catholic church is one of the richest institutions in the world (Yglesias, 2013).

The effects of the different religions will be tested by including an interaction effect between the different religions and income to the regression model. The interaction effects have been standardized to compare the magnitudes of the coefficients between the different religions.

Church Attendance	*Coef.*	*P>[t]*	
Income	-.27167	0.000	***
Religion			
*Catholic*Income*	.3039	0.000	***
*Protestant*Income*	.5374	0.000	***
*Muslim*Income*	.0268	0.002	***
*EasternRel.*Income*	.0124	0.148	-
Year FE	YES	YES	-

Praying Freq.	*Coef.*	*P>[t]*	
Income	-.2967	0.000	***
Religion			
*Catholic*Income*	.3051	0.000	***
*Protestant*Income*	.5227	0.000	***
*Muslim*Income*	.0729	0.000	***
*EasternReli.*Income*	.0133	0.123	-
Year FE	YES	YES	-

Table 3 *– Regression outcome of income on religiosity including interaction effects of different religions in the Netherlands (2007-2012)*

[4] Aayah No. 254, Surah Al-Baqarah, Chapter 2 from the Quran

Without including a fixed effect, the results in *Table 3* show that indeed, the coefficient of the interaction effect of income and Protestantism has the biggest magnitude, followed by the Roman Catholics. According to this, the hypothesis that the influence of income on religiosity depends on the type of religion cannot be rejected.

When introducing the person specific fixed effects to the model the results, as can be found in *Appendix 2B*, give some remarkable outcomes. For attendance to religious gatherings, the overall effect of income on external religiosity turns to insignificance. This also happens to the interaction effect for all religions. However, the coefficient on the correlation between income and praying frequency remained significant. Besides this, the interaction effect of income and Protestantism showed a significant positive coefficient.

The results thus show that it seems indeed that the effect of income on religiosity is stronger for Protestants than for other religions in the Netherlands. However, when adding a person fixed effect to the model, the hypothesis that there is a stronger effect for protestants cannot be accepted. In contrary, the effect of income on internal religiosity, measured in praying frequency, seems to be positive for the Protestants.

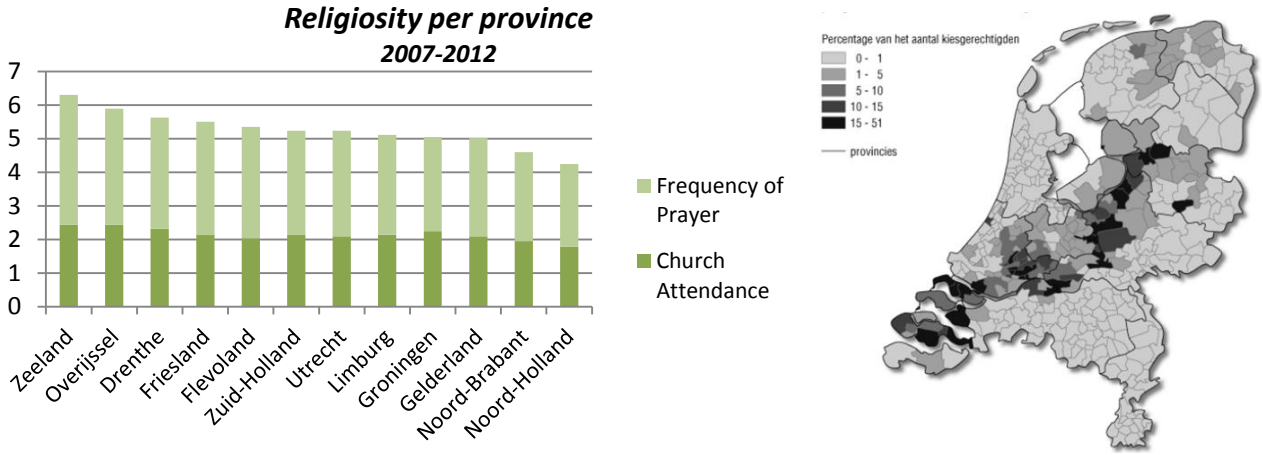
The effect of the province in which you live

Next to the time you live in and your personal characteristics that influence your religiosity, one might argue that the place or region you live in matters. It might be the case that living in an area where it is common to go to church or where a lot of religious buildings are located, influences you to go as well. Previous research backed up this idea of environmental influence (Kirk, Maes, et al, 1999).

In the used panel data, the exact address and the municipality in which the participants live are not given. However, the LISS commission provided information on the provinces in which participants live upon request, so that estimations on the influence of region on the relation between income and religiosity could still be made.

As can be seen in the *graph 3,* when taking the average church attendance and praying frequency per province, religiosity is perceived to be highest in the provinces Zeeland and Overijssel. This is consistent when you look at the location of the Bible Belt, which is a part of the Netherlands in the shape of a belt going from Zeeland to Overijssel where most Protestants and Roman Catholics live (Giesen, 2013). Noord-Holland and Noord-Brabant are the provinces

where religiosity is relatively the lowest in the Netherlands. This is consistent with data obtained by the CBS (CBS, 2014).



Graph 3 *– religiosity per province in the Netherlands and the location of the Bible Belt (source: Nationale Atlas Volksgezondheid,2014).*

In order to estimate the possible effect of the region you live in on religiosity, the basic regression on church attendance and frequency of prayers has been extended. Leaving out the fixed individual effect for now, it can be seen in the tables below that there is a significant negative effect of living in the provinces Noord-Holland and Noord-Brabant on both church attendance and frequency of prayers. There seems to be a positive effect of living in Zeeland, Drenthe, Friesland and Overijssel on religiosity. However, this effect is not significant when you look at church attendance as a measure of religiosity.

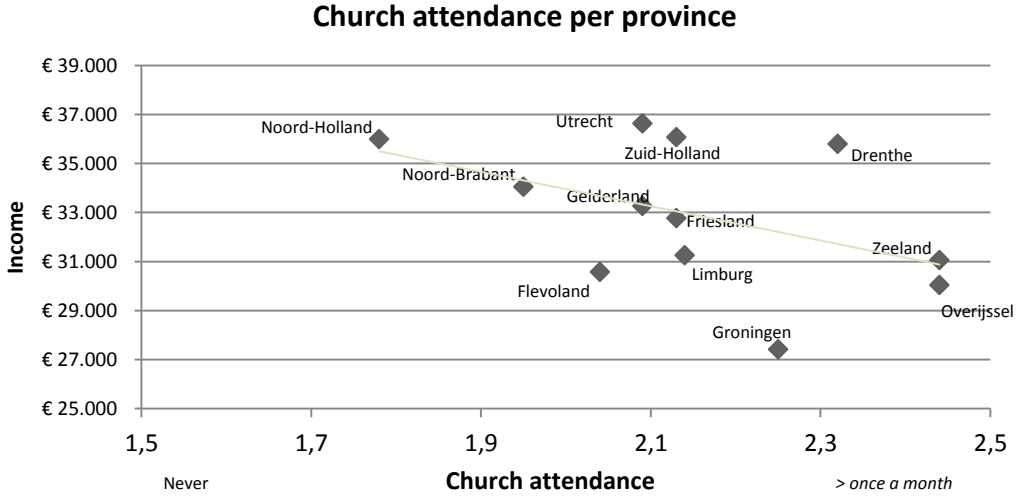
When adding back the fixed individual effect, all observed effects of the different provinces on church attendance and frequency of prayers turned insignificant. For church attendance, this meant that also the effect of income turned out highly insignificant. However, the effect of income on how often one prays remained significant ($p=0.046$) after adding the different provinces to the model, but moved very close to zero. A reason for the suddenly insignificant coefficients could be that the effect of the province you live in, is already captured by the individual fixed effect since a better look into the data showed that only a very small amount of participants moved to another province within the six years.

Church Attendance	Coef.	P>[t]	
Income	-.02368	0.021	***
Province			
Zeeland	.0554	0.524	-
Overijssel	.0463	0.496	-
Drenthe	.0402	0.641	-
Friesland	-.1086	0.136	-
Limburg	-.1716	0.010	**
Flevoland	-.1928	0.027	**
Utrecht	-.1940	0.004	***
Gelderland	-.2020	0.001	***
Noord-Brabant	-.2983	0.000	***
Noord-Holland	-.4248	0.000	***

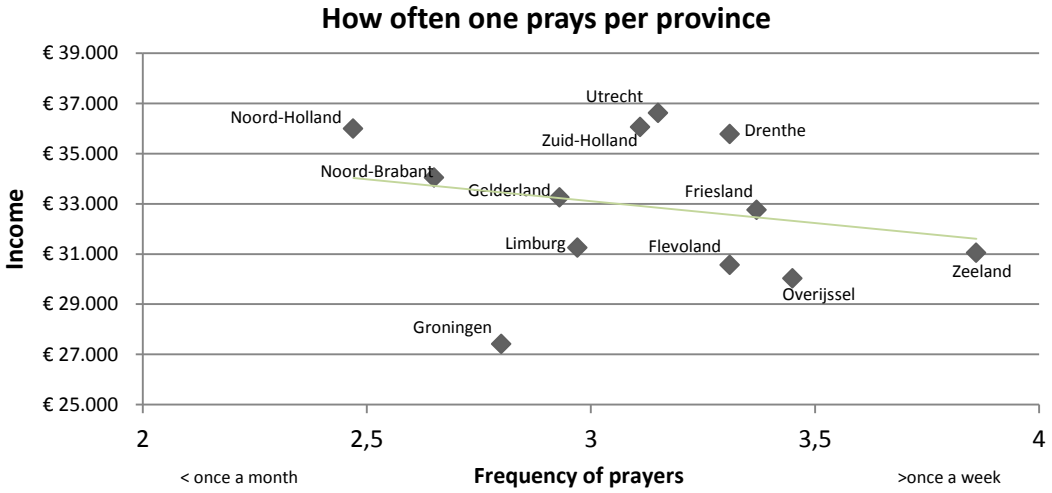
Frequency of Prayers	Coef.	P>[t]	
Income	-.05505	0.000	***
Province			
Zeeland	.3464	0.000	***
Drenthe	.2652	0.002	***
Friesland	.1993	0.006	***
Overijssel	.1825	0.007	***
Utrecht	.0840	0.212	-
Zuid-Holland	-.0116	0.848	-
Limburg	-.0212	0.752	-
Gelderland	-.0435	0.483	-
Noord-Brabant	-.1364	0.025	**
Noord-Holland	-.2339	0.000	***

Table 3 - *Regression outcome adding provinces to the model. Full results including year effects in Appendix 2C*

After having established that some provinces are more religious than the others, whether it is included in the fixed effect or not, the question arises why this is the case. More importantly, the question arises what the role of income is in this observation. To examine this, for each province the average income has been established, as well as average church attendance and prayer frequency. The numbers can be found in *Appendix 3* and results are plotted in a scatterplot, in which can be seen that there seems to be a negative relationship between income and attendance to religious gatherings among the provinces.



Graph 4 *– Average income scattered against church attendance among provinces in the Netherlands (2007-2012)*



Graph 5 *– Average income scattered against praying frequencies among provinces in the Netherlands (2007-2012)*

Both scatterplots are in line with the previous made hypotheses that income is negatively correlated with religiosity. Provinces where religiosity is lowest, namely Noord-Holland and Noord-Brabant, have a relatively high average net income. On the other hand, in provinces where religiosity is lowest, namely Zeeland and Overijssel, income is relatively low. If the theory holds, these scatterplots may also explain why church attendance and frequency of prayers is not that high in Utrecht and Zuid-Holland, even though they are a part of the Bible Belt (Giesen, 2013). In other words, even though a relatively high percentage of individuals in Utrecht and Zuid-Holland is member of a religion, religiosity is relatively lower than in Zeeland, due to their relatively higher incomes.

To test the observed relation among income and religiosity in the different provinces, a regression will be run on the effect of income on both church attendance and frequency of prayers using yearly average attendance and praying frequencies and incomes per province, as can be found in *Appendix 3.*

Results show that indeed there is indeed a correlation between income and religiosity for both external (i.e. church attendance) and internal (i.e. frequency of prayers) measures of religiosity. Adding a fixed effect for each province, makes this effect even increase in significance and magnitude. However, when introducing a year specific effect to the model, the correlation between income and religiosity turns insignificant for both internal and external religiosity, while the dummies for each year all seem to have a significant positive effect on religiosity.

ChurchAtt.	*Coef.*	*p<[t]*	R^2	*Coe.*	*P<[t]*	R^2	*Coef.*	*P<[t]*	R^2
Net Income	-.3556	(0.002)	.127	-.4226	(0.001)	.19	-.0261	(0.592)	.911
Province FE		NO			YES			YES	
Year FE		NO			NO			YES	
Praying	*Coef.*	*p<[t]*	R^2	*Coef.*	*P<[t]*	R^2	*Coef.*	*P<[t]*	R^2
Net Income	-.2251	(0.057)	.051	-.3013	(0.019)	.198	-.0339	(0.759)	.539
Province FE		NO			YES			YES	
Year FE		NO			NO			YES	

Table 4 *– The effect of income on religiosity, taking average incomes and frequencies of attendance and praying in the different provinces in the Netherlands as independent variables (2007-2012).*

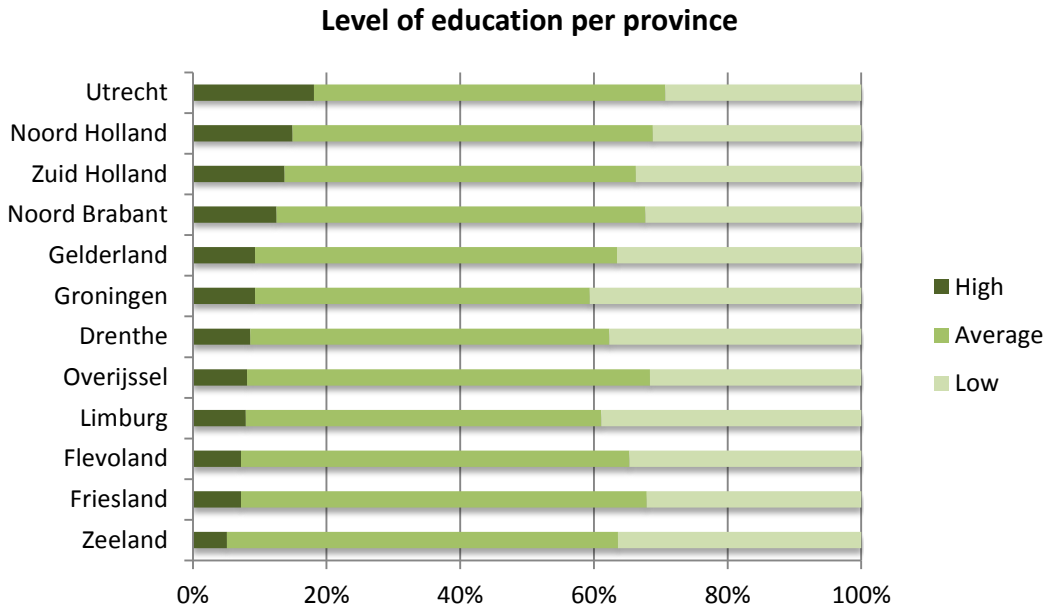
These results indicate that the correlation between income and religiosity is also visible among the different provinces in the Netherlands, as in that the provinces with more income tend to spend less time in religious activities. However, it is not likely that this correlation is due to a causal effect of income on religiosity because the effect diminishes after including specific year effects.

The effect of education

Having studied the different income and religiosity levels per province in the Netherlands, another effect comes to mind that might alter the observed results. Quite a few researches have shown a negative relation between the level of education and religiosity (Scheepers, Grotenhuis, & Slik, 2002). The higher the level of education, the less likely one is to believe in God, the less favorable one is toward the church and the less importance one attaches to religious values (Albrecht & Heaton, 1984). Note that there is a difference between intelligence and the level of education. In this paper, intelligence is defined as one's ability to learn, measured by the Intelligence Quote (Meriam-Webster, 2015). In this paper, it is seen as a fixed effect that is already captured by the fixed individual effect. The level of education however, is measured by the question "what is the highest level of education you have completed with a diploma or certificate?" in our panel data. The level of education differs from IQ in a sense that one can have high levels of intelligence and still only followed a relatively low form of education (Sewell & Shah, 1967). As higher levels of education teach you to think critically and surround you with

non-religious people, a negative relation between higher levels of education and religiosity might arise as a form of adaption to this environment (Paas & Peels, 2013).

Looking back to the different provinces of the Netherlands, education levels indeed seems to be higher in provinces with relatively lower levels of religiosity. As can be seen in *graph 6*, levels of education are lowest in Zeeland, where religiosity has been observed to be highest, and relatively high in Noord-Holland, where religiosity has been observed to be relatively low. Since research has shown that a higher level of education is mostly related with higher levels of income and economic benefits (Miller, 1960), education might have been a confounding factor in the previously found correlation between income and religiosity.



Graph 6 *- Average level of education in the different provinces in the Netherlands between 2007-2012.*

Since the 26 different levels of education in the LISS panel data do not give a clear indication of what the effect of education on religiosity is, the different levels have been divided into three groups: high education levels, average education levels and low education levels. What levels of education are taken under which group can be found in *Appendix 4***.**

Adding the separate dummies to our regression model, leaving out the fixed individual effect for now, higher education levels seem to have a negative, significant (p=0.002) effect on church attendance. Also, higher education levels have a bigger coefficient than the lower education level, indicating that the higher the level of education, the bigger the negative effect on religiosity. As can be seen in the table below, the coefficient on net income turned insignificant

after adding the education levels to our model, while the goodness of fit increased. This seems to indicate that education is a confounding factor in the established relation between income and religiosity.

However, the relation between income and how often one prays remained significant after adding the dummies for education to the model. The coefficients of higher educational levels in the effect on how often one prays, are also found to be bigger than the coefficients for educational levels in their effect on church attendance. Even though having a relatively high level of education is negatively correlated with how often you pray, this does not eliminate the effect income has on internal religiosity.

Church Attendance	Coef.	P>[t]	
Income	-.02058	0.083	
Average_Education	-.0750	0.003	***
High_Education	-.1176	0.002	***
Constant	.06722		

Fequency of Prayer	Coef.	P>[t]	
Income	-.0385	0.001	***
Average_Education	-.1738	0.000	***
High_Education	-.2516	0.000	***
Constant	.1026		

Table 5 *- Outcomes of the extended regression of income on religiosity. Full results can be found in Appendix 2D.*

After adding back the person-specific fixed effects to the model, the regression of income to church attendance showed an insignificant coefficient for income (p=0.776). however, even when fixed individual effects are included, having obtained a high education level is still negatively correlated with church attendance (p=0.12). The effect of income on praying frequency remained significant after adding the fixed individual effect and the levels of education, but again turned very close to zero, as can be seen in *Appendix 2D*. These results indicate that indeed, income is a poor indicator of religiosity and is most likely caused by other person-specific effects. It also still might be the case that one of the confounding person-specific factors is intelligence, which is turning the significance of education level insignificant when adding the person-specific effect. The reason for this might be that even though intelligence and education levels are different concepts, the two are strongly correlated (Deary, Strand, et all; 2007).

Discussion – different sources of income

From the obtained results from the different regressions, both hypotheses can be evaluated. The first hypothesis: "*An increase in income will lead to a decrease in time allocated*

to religious activities" cannot be accepted for external religious activities (i.e. for church attendance). Over all the hypothesis seems to hold, but after adding several effects to the model such as year and individual specific effects and the effect of region and education, the effect of income on church attendance disappears. For internal religious activities (measured in how often you pray), the hypothesis cannot be rejected. Even after adding the mentioned control effects, the negative effect of income on praying frequency remained, though in a very small magnitude. Since external and internal religiosity are both measures of religiosity, over all the first hypothesis cannot be rejected since an increase in income will lead to a decrease in time allocated to internal religious activities. However, since the magnitude of the effect is so small, results are not convincing enough to accept the hypothesis either.

The second hypothesis: "*An increase in income will lead to a decrease in internal religious activities which is relatively bigger than the decrease in external religious activities."* can thus also not be rejected since the effect of income only remained significant for internal religious activities. Besides this, before adding all controls to the model, the basic regression already showed that the coefficient of income on frequency of prayer had a bigger magnitude than the coefficient of income on church attendance. Based on this empirical research on the LISS panel in the Netherlands, there is no sufficient proof to reject the hypothesis. However, there is still room for discussion.

Until now, this research has been looking at the effect of net income on religiosity, defining net income as the income a household can use for consumption after several deductions have been made. However, net income has different sources. It consists mainly of the wage or salary obtained from work, but there could also be external sources contributing to it, such as income from damages, study compensation or winning a lottery. These sources can be seen as external sources of income, which can be included in our theoretical model. Denoting external sources of income (income other than income from labor) as *v*, the income constraint of an individual will change to the following:

$$\sum_{t=1}^{n} \frac{px_t}{(1+i)^{t-1}} = \sum_{t=1}^{n} \frac{v + w_t l_t}{(1+i)^{t-1}}$$

This formula shows that now, consumption depends on non-labor income as well.

As a consequence, also the Lagrangian equation changes:

$$L = U[C(x_1 h_1), \dots, C(x_n h_n), q(r_1, \dots r_n)] + \lambda(\sum_{t=1}^{n} \frac{p x_t}{(1+i)^{t-1}} - \sum_{t=1}^{n} \frac{v + w_t(T - h_t - r_t)}{(1+i)^{t-1}})$$

From this changed formula, it can be obtained that:

$$\frac{\partial r_i}{\partial v} > 0 \text{ for each individual}$$

This means that an increase in the level of exogenous non-labor income will lead to an increase in religious participation (Azzi & Ehrenberg, 1975). Where income from labor is found to have a negative effect on participation in religious activities, income from external sources is thus likely to have a positive effect of religiosity. This theory would support the paper by Buser (2014). In his research, he made use of a cash transfer by the government in Ecuador as a source of exogenous income shocks. His results indeed showed that relatively bigger income shocks led to an increase in participation in church activities (Buser, 2014).

External sources of income – Unemployment

In the LISS panel dataset, it is probable that net income per household over the years as used in the regressions, includes both wages and external sources of income. Knowing that there might be a difference between the effect of external and internal income on religiosity, one might argue that a division is needed to test the true effect. However, there is too little data and information to perform a regression on external sources of income as Buser (2014) did. Therefore, this research looks into another major exogenous shock that influences your income level: getting unemployed.

Being unemployed is defined by being of working age and actively seeking for work, but not being able to find it (Brandolini, Cipollone, et all; 2006). In this paper, unemployment among the different provinces is measured by the unemployment rate per province, which divides the number of unemployed individuals in that province to the total number of individuals in the labour market in that same province (CBS, 2012).

Taking unemployment rates per province for the years 2007 until 2012 from the CBS database (CBS, Beroepsbevolking; kerncijfers provincie 1987-2014, 2015) and combining it with the average attendance to religious gatherings and praying frequencies in those provinces, a linear regression could be run on the effect of unemployment on religiosity. The used numbers can be found in *Appendix 3.* When the hypothesis indeed holds that an increase in income will cause a

decrease in religiosity, religiosity is expected to be positively correlated with unemployment rate since unemployment is related with lower incomes. Besides that, unemployment is related with having more time left which in this case could be spend on religious gatherings (Raphael & Winter, 2001). Since unemployment is an external source of income, according to the used time allocation theory of Azzi and Ehrenberg (1975) and the paper of Buser (2014) who argues that a negative shock in external income will have exactly the opposite effect of that of a positive external shock. Since their theories predicted a positive effect of external income on religiosity, it can also be argued that an increase in unemployment, as a negative shock, will lead to a decrease in religiosity.

Nevertheless, results show that unemployment rate is not at all significantly correlated with both church attendance and praying frequency. As can be seen in *Table 6*, there seems to be a negative effect of unemployment rate on religiosity. However, this effect is no longer significant when control variables are introduced. When adding a year specific effect to the model, just as for the effect of income on religiosity per province, all the year-dummies have a significant effect on religiosity, which is increasing in magnitude over the years. However, in contrary to the first models, in this regression all year dummies seem to have a positive effect on religiosity. This difference in outcome between the regression on unemployment and previous regressions has a negative impact on the robustness and reliability of the previous regressions on income and religiosity.

ChurchAtt.	*Coef.*	*p<[t]*	R^2	*Coe.*	*P<[t]*	R^2	*Coef.*	*P<[t]*	R^2
Unemploym.	-.0277	(0.817)	.001	-.0374	(0.782)	.036	-.0749	(0.116)	.915
Province FE		NO			YES			YES	
Year FE		NO			NO			YES	

Praying	*Coef.*	*p<[t]*	R^2	*Coe.*	*P<[t]*	R^2	*Coef.*	*P<[t]*	R^2
Net Income	-.113	(0346)	.013	-116	(0.367)	.132	0.106	(0.331)	.546
Province FE		NO			YES			YES	
Year FE		NO			NO			YES	

Table 6 *– Regression outcome of the correlation between the unemployment rate and average church attendance and praying frequency among the different provinces in the Netherlands (2007-2012)*

Since the unemployment rate is uncorrelated with religiosity, the observed negative correlation between income and religiosity is less likely to be a causation. Instead, the correlation between income and religiosity is likely to be caused by a confounding factor.

Internal sources of income – Labor income

Since the information on external sources of income is too limited in the LISS sample of individuals, this paper focuses on uncovering the effect of income on religiosity only taking income from labor into account. To measure the wage, the answers to the following question have been used: *"Can you indicate the net amount of wages that you received in 2012 at the employer where you earned the most? This again concerns the total amount of wages received over the whole year, including holiday allowance, 13th month and profit sharing schemes."*. This question has been repeated for the employers where you earned second and third most. Adding up the wages from different employers, the total wage per individual has been calculated. After this, a regression on total wage on religiosity has been run.

According to the theory as described above, the hypothesis would be that the negative effect of wage on religiosity is bigger than the negative effect of total net income, since the latter contains a probably positive effect of external sources of income as well. However, the results of the regression show rather contradicting results. As can be seen in *Table 7*, the correlation between wage and church attendance and between wage and frequency of prayer is relatively smaller than the correlation between total yearly net income and the two measures of religiosity. Also, when including fixed year effects and an individual specific fixed effect to the regression model, the coefficients for wage on both church attendance and frequency of prayers turned insignificant.

ChurchAtt.	*Coef.*	*p<[t]*	R^2	*Coe.*	*P<[t]*	R^2	*Coef.*	*P<[t]*	R^2
Wage	-.0360	(0.003)	.002	`-.0347	(0.004)	.002	-.0044	(0.541)	.9184
Year FE		NO			YES			YES	
Individual FE		NO			NO			YES	

Praying	*Coef.*	*p<[t]*	R^2	*Coe.*	*P<[t]*	R^2	*Coef.*	*P<[t]*	R^2
Wage	-.0407	(0.002)	.002	-.0405	(0.001)	,003	,0018	(0.784)	.9301
Year FE		NO			YES			YES	
Individual FE		NO			NO			YES	

Table 7 *– Regression outcome of the correlation between wage and religiosity in the Netherlands (2007-2012)*

Even though there seems to be an effect of income on religiosity, and even though it seems to be bigger for internal than external religiosity, the effect turns insignificant when some basic control variables are added to the model. Therefore, based on this regression on wage and religiosity, both hypotheses cannot be accepted.

What caused this difference in results when using wage and when using total net income? Looking better into the data and the specific individuals from the LISS panel, some irregularities can be found between the answers on the question on net income and the question on wage earned. It seems as though some individuals made mistakes while filling in the questionnaire. For example, there are individuals indicating to have a net income of 10,000 euros, while stating that they earned 100,000 euros at the employer where they earn the most. It is likely that the respondent made a mistake while writing down the number of zero's in one of the answers. Mistakes like these occurred often and led to either an understatement of wages and an overstatement of net income, or the other way around. Knowing that these mistakes have occurred, combined with the insignificant results from the regression on wage and religiosity, previously made conclusions about the hypotheses are not reliable and shows that further research on this topic, using more reliable data, is needed.

Conclusion

Different religions, among which Christianity is the most far going, warn for the negative influences income may have on religiosity and faith. This idea is backed up by quite a few scientific researches. However, little research has been done on the relation between income and religiosity on an individual level, using both internal and external religiosity. Especially in a time where wellbeing in terms of income is rising, but where we see churches closing, observing a relation between income and religiosity might be of social interest. Building upon an economic theory by Azzi and Ehrenberg (1975), two hypotheses have been made:

- An increase in income will lead to a decrease in time allocated to religious activities

- An increase in income will lead to a decrease in internal religious activities which is relatively bigger than the decrease in external religious activities

In order to answer both hypotheses, answers on questionnaires by the LISS panel from the Netherlands on income and religiosity over the years 2007 until 2012 have been examined. A basic regression was run to find the relation between income and external religiosity, measured by how often one goes to church, and internal religiosity, measured by how often one prays. Results showed that indeed, it seems as though income is negatively correlated with time spent in religious activities. The negative relation with internal religiosity was also bigger in magnitude than the negative relation with external religiosity. However, after adding fixed individual effects and fixed year effects, the observed correlation between income and religiosity turned out to be insignificant, while remaining significant for internal religiosity. Even after adding two extra control variables, namely the effect of the region you live in and the effect of education, the negative correlation between income and internal religiosity remained. Nevertheless, the effect of income on religion decreased to a very small magnitude. Still, when looking at the different incomes and time spent on religious activities across the different provinces in the Netherlands, seems to be a negative correlation between income and religiosity.

However, when using unemployment rates and labor wages instead of net income to run the same regressions, results turn out to be less reliable. A deeper look into the data also showed that participants made some mistakes while filling in the questionnaire. The research question: "*What is, if any, the relationship between income and religiousness in the Netherlands between 2007 and 2012?"* can thus not be answered with much certainty.

Nevertheless, this does not make this research useless. This empirical research on the relation between income and religiosity in the Netherlands showed that income is a poor indicator of both internal and external religiosity. This outcome sheds another light on researches that showed a significant correlation between income and religiosity, making this paper still of scientific relevance.

This research also provides ground for future research on the relationship between income and religiosity. By measuring income and religiosity over more years, using a more accurate dataset or by obtaining data on income and religiosity per municipality instead of per province in the Netherlands, one might come closer to uncovering the causal effect that income might or, apparently more likely, might not have on religiosity.

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Appendix

Appendix 1 – *Testing for variances in income in the Netherlands between 2007 and 2012*

Variable	Obs	Mean	Std. Dev.	Min	Max
CIncome	5403	1142.533	34504.14	-452000	664000

Appendix 2 – Regression Outcomes

2A. *Outcome of the basic regression of income on internal and external religiosity in the Netherlands (2007-2012)*

z1Church	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
z1Income	.0012691	.0050517	0.25	0.802	-.0086339	.011172
Year						
2008	-.0125423	.0123775	-1.01	0.311	-.0368065	.0117219
2009	-.0159603	.0129834	-1.23	0.219	-.0414122	.0094917
2010	-.0365245	.0134638	-2.71	0.007	-.0629182	-.0101307
2011	-.0858993	.0136985	-6.27	0.000	-.1127531	-.0590455
2012	-.0842159	.0143367	-5.87	0.000	-.1123207	-.0561112
ID						
800057	.1562902	.2577297	0.61	0.544	-.3489482	.6615287

z1Pray	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
z1Income	-.009327	.0046773	-1.99	0.046	-.0184962	-.0001578
Year						
2008	.01152	.0114815	1.00	0.316	-.0109877	.0340276
2009	-.0098483	.0120351	-0.82	0.413	-.0334413	.0137447
2010	-.027243	.0124695	-2.18	0.029	-.0516876	-.0027984
2011	-.0384455	.012695	-3.03	0.002	-.063332	-.013559
2012	-.0353289	.013282	-2.66	0.008	-.0613662	-.0092917
ID						
800057	-.1340966	.238506	-0.56	0.574	-.6016502	.333457

2B. *Outcome of the regression of income on internal and external religiosity in the Netherlands (2007-2012) including interaction effects of the different religions.*

z1Church	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
z1Income	-.0039361	.0060793	-0.65	0.517	-.0158536	.0079815
z1Catholic	.0095432	.0070171	1.36	0.174	-.0042127	.0232992
z1Protestant	.007456	.00719	1.04	0.300	-.0066389	.0215509
z1Muslim	-.0089179	.0086618	-1.03	0.303	-.0258979	.0080622
z1Eastern	.0065048	.0090661	0.72	0.473	-.0112678	.0242774
Year						
2008	-.012395	.0123818	-1.00	0.317	-.0366675	.0118775
2009	-.0160537	.0129853	-1.24	0.216	-.0415095	.009402
2010	-.0359978	.0134709	-2.67	0.008	-.0624054	-.0095902
2011	-.0849911	.0137073	-6.20	0.000	-.1118621	-.0581202
2012	-.0828003	.014358	-5.77	0.000	-.110947	-.0546536
ID						
800057	.1595835	.257736	0.62	0.536	-.3456674	.6648344

z1Pray	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
z1Income	-.0153914	.005622	-2.74	0.006	-.0264124	-.0043704
z1Catholic	-.0006678	.0064953	-0.10	0.918	-.0134007	.0120652
z1Protestant	.0231397	.0066296	3.49	0.000	.0101433	.036136
z1Muslim	-.0012626	.0080092	-0.16	0.875	-.0169634	.0144382
z1Eastern	-.0039592	.0083828	-0.47	0.637	-.0203923	.012474
Year						
2008	.0111828	.0114773	0.97	0.330	-.0113167	.0336822
2009	-.0099095	.0120281	-0.82	0.410	-.0334887	.0136697
2010	-.0269128	.0124675	-2.16	0.031	-.0513534	-.0024721
2011	-.0381421	.0126944	-3.00	0.003	-.0630274	-.0132568
2012	-.0345866	.013293	-2.60	0.009	-.0606455	-.0085276
ID						
800057	-.130361	.2383423	-0.55	0.584	-.5975937	.3368717

***2C** – Outcome of the regression of income on both external and internal religiosity in the Netherlands, including the region (or province) effect (2007-2012)*

z1Church_Att~e	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
z1Income	.0011509	.0050411	0.23	0.819	-.0087313	.0110331
Province						
Friesland	1.839428	.4884843	3.77	0.000	.8818303	2.797025
Drenthe	.0971866	.2879858	0.34	0.736	-.4673647	.661738
Overijssel	.5307103	.3800073	1.40	0.163	-.2142347	1.275655
Flevoland	.1833151	.3490166	0.53	0.599	-.5008775	.8675078
Gelderland	.1111544	.3232021	0.34	0.731	-.5224329	.7447417
Utrecht	.1303141	.3300964	0.39	0.693	-.5167884	.7774165
Noord-Holland	.0472468	.3238797	0.15	0.884	-.5876689	.6821625
Zuid-Holland	.022759	.3307712	0.07	0.945	-.6256662	.6711843
Zeeland	.4946874	.5433018	0.91	0.363	-.570371	1.559746
Noord-Brabant	.2554197	.3516051	0.73	0.468	-.4338472	.9446866
Limburg	.667715	.3911872	1.71	0.088	-.0991464	1.434576
Year						
2008	-.0097027	.0123731	-0.78	0.433	-.0339582	.0145529
2009	-.0145353	.0129723	-1.12	0.263	-.0399654	.0108948
2010	-.0359185	.0134562	-2.67	0.008	-.0622973	-.0095398
2011	-.085024	.0136989	-6.21	0.000	-.1118785	-.0581695
2012	-.0835522	.0143561	-5.82	0.000	-.1116951	-.0554093
ID						
800057	.6647428	.3558095	1.87	0.062	-.0327662	1.362252

z1Pray	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
z1Income	-.0093473	.0046839	-2.00	0.046	-.0185293	-.0001653
Province						
Friesland	-.0025959	.4536342	-0.01	0.995	-.8918753	.8866835
Drenthe	-.0445282	.2674401	-0.17	0.868	-.568803	.4797466
Overijssel	.1485083	.3528966	0.42	0.674	-.5432907	.8403073
Flevoland	.1656349	.3241165	0.51	0.609	-.4697452	.8010149
Gelderland	.4238808	.3001439	1.41	0.158	-.1645048	1.012266
Utrecht	.1894133	.306546	0.62	0.537	-.4115226	.7903491
Noord-Holland	.2155985	.300773	0.72	0.474	-.3740204	.8052174
Zuid-Holland	.1926259	.307173	0.63	0.531	-.4095391	.7947909
Zeeland	-.0035665	.5045405	-0.01	0.994	-.9926398	.9855068
Noord-Brabant	.1667357	.3265205	0.51	0.610	-.4733571	.8068285
Limburg	.211039	.3632783	0.58	0.561	-.5011116	.9231897
Year						
2008	.0118599	.0115178	1.03	0.303	-.0107189	.0344388
2009	-.0099714	.0120671	-0.83	0.409	-.033627	.0136843
2010	-.0268585	.0125063	-2.15	0.032	-.0513752	-.0023418
2011	-.0380544	.01274	-2.99	0.003	-.0630291	-.0130797
2012	-.035042	.0133468	-2.63	0.009	-.0612063	-.0088777
ID						
800057	-.178151	.3304246	-0.54	0.590	-.8258971	.4695952

2D – *Outcome of the regression of income on internal and external religiosity in the Netherlands, including the effect of education level.*

z1Church	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
z1Income	-.0016829	.0059019	-0.29	0.776	-.0132534	.0098876
Opleding						
Middel	.0222128	.0463759	0.48	0.632	-.0687063	.1131319
Hoog	-.1826909	.0728537	-2.51	0.012	-.3255191	-.0398627
Year						
2008	-.0066726	.0128675	-0.52	0.604	-.031899	.0185538
2009	-.0151246	.0135799	-1.11	0.265	-.0417478	.0114985
2010	.0836698	.1223878	0.68	0.494	-.1562691	.3236086
2011	-.087578	.0143131	-6.12	0.000	-.1156385	-.0595175
2012	-.0840405	.0150744	-5.58	0.000	-.1135935	-.0544875
ID						
800057	.363435	.2623212	1.39	0.166	-.1508405	.8777105

z1Pray	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
z1Income	-.0113863	.005647	-2.02	0.044	-.0224571	-.0003154
Opleding						
Middel	.0135493	.0440256	0.31	0.758	-.072762	.0998606
Hoog	.0488666	.0694827	0.70	0.482	-.087353	.1850861
Year						
2008	.0081014	.0123344	0.66	0.511	-.01608	.0322829
2009	-.0095981	.0130079	-0.74	0.461	-.0350999	.0159036
2010	-.1613298	.1169875	-1.38	0.168	-.3906816	.068022
2011	-.0399751	.0137073	-2.92	0.004	-.066848	-.0131021
2012	-.0390406	.0144321	-2.71	0.007	-.0673345	-.0107467
ID						
800057	-.1685342	.2508009	-0.67	0.502	-.6602246	.3231563

Appendix 3: *Net Income, frequency of prayers, church attendance and unemployment per province in the Netherlands – 2007-2012*

	2007	2008	2009	2010	2011	2012	- Average
Drenthe							
Net Inc.	37139,43	35160,7	32494,5	36149,9	29385,9	28457,6	***33131,34***
Pray	3,02	2,9	3,04	3,16	3,76	3,48	***3,23***
ChurchAtt.	1,91	2,04	2,14	2,21	2,29	2,54	***2,19***
Unempl.	5,8	5,7	3,6	4,1	3,6	5,1	***4,65***
Flevoland							
Net Inc.	34250,2	31247	35244,6	28589,2	32459,3	25891,2	***31280,25***
Pray	2,59	2,87	3,16	2,71	3,44	3,93	***3,12***
ChurchAtt.	1,89	2,01	2,13	2,21	2,28	2,52	***2,17***
Unempl.	4,8	5,1	4,8	7,1	5,3	3,3	***5,07***
Friesland							
Net Inc.	39093,1	37249,3	33462,4	32891,87	32324,55	35910	***35155,20***
Pray	3,07	3,07	2,97	3,2	3,28	4,08	***3,28***
ChurchAtt.	1,93	2,07	2,15	2,22	2,3	2,61	***2,21***
Unempl.	4,7	6,1	6,1	7	6,3	3,4	***5,60***
Gelderland							
Net Inc.	25938,32	36622,5	35598,3	37009,95	26447,8	31586,7	***32200,60***
Pray	3,3	3,1	3,04	3,32	2,9	3,35	***3,17***
ChurchAtt.	1,89	2,01	2,12	2,2	2,28	2,5	***2,17***
Unempl.	4,3	4,6	5,9	3,2	6,8	5,2	***5,00***
Groningen							
Net Inc.	33231	33696,3	35097,1	24617,6	25600,39	29948	***30365,07***
Pray	2,71	2,87	3,18	2,86	2,85	3,75	***3,04***
ChurchAtt.	1,95	2,08	2,16	2,23	2,3	2	***2,12***
Unempl.	3,3	4	3,8	5,9	7,4	5,5	***4,98***
Limburg							
Net Inc.	36650,7	32695	35204,2	33671,3	37638,4	27700,7	***33926,72***
Pray	2,5	2,64	2,86	3,13	3,22	3,72	***3,01***
ChurchAtt.	1,73	1,96	2,08	2,16	2,23	2,36	***2,09***
Unempl.	5,2	3,9	4,8	4,2	6,2	3,7	***4,67***
Noord Brabant							
Net Inc.	36236,3	33883,4	33646,5	31336,24	38398,1	32944,8	***34407,56***
Pray	2,52	2,65	2,92	3,39	3,32	3,82	***3,10***
ChurchAtt.	1,76	1,97	2,09	2,16	2,23	2,41	***2,10***
Unempl.	5,3	4,5	5	5,5	5,3	3,9	***4,92***

Noord Holland							
Net Inc.	35794,3	34315,6	30678,8	32704,6	32527,5	30647,8	***32778,10***
Pray	2,49	2,66	2,98	3,43	2,8	3,45	***2,97***
ChurchAtt.	1,8	1,99	2,11	2,17	2,26	2,44	***2,13***
Unempl.	3,4	5,3	4	8	6,5	5,3	***5,42***
Overijssel							
Net Inc.	39883,6	29302,2	35605,89	31478,7	40890	28251	***34235,23***
Pray	3,02	3,2	3,56	3,06	3,45	3,52	***3,30***
ChurchAtt.	1,89	2,04	2,13	2,21	2,28	2,52	***2,18***
Unempl.	5,7	4,8	7	4,6	5,6	4,1	***5,30***
Utrecht							
Net Inc.	37526,8	32601,5	34468,8	30971,1	38311,8	29911,6	***33965,27***
Pray	2,55	3,38	3,18	3,47	3,25	3,49	***3,22***
ChurchAtt.	1,85	2	2,12	2,18	2,27	2,48	***2,15***
Unempl.	4,7	5,7	4,5	6	6,1	5,3	***5,38***
Zeeland							
Net Inc.	38800,4	31491,5	31420,1	31687,8	25630,4	33131,2	***32026,90***
Pray	2,35	3,12	3,38	3,37	2,68	3,4	***3,05***
ChurchAtt.	1,76	1,98	2,1	2,17	2,24	2,42	***2,11***
Unempl.	6,2	6,3	6,5	4,1	7,3	4,7	***5,85***
Zuid Holland							
Net Inc.	32704,5	31805,5	39196,4	32996,8	28581,8	37726	***33835,17***
Pray	2,42	3,23	3,02	2,98	3,05	2,35	***2,84***
ChurchAtt.	1,78	1,99	2,1	2,17	2,26	2,43	***2,12***
Unempl.	4,2	5,4	7,5	5,9	5,7	4,1	***5,47***

Appendix 4 – *Overview of the division of different education levels.*

High education	Average Educational level	Low Education level
Conservatory and art academy	HBS (former pre-university education)	Did not complete any education
Academic education (incl technical and economic colleges – Bachelor)	HAVO (higher general secondary school)	Did not complete primary school
Academic education (incl technical and economic colleges – Master)	VWO (pre-universiteit education)	Primary School
Academic education (bachelor)	Gymnasium, athenaeum, lyceum	Lower and continued special education
Academic education (Master)	KMBO (short intermediate professional education)	VLGO continued lower education
Doctor's degree (PH.D)	MBO professional training program MBO plus to access HBO, short HBO education	LBO (lower professional education)
	HBO (higher professional education)	Lower technical school, household school
	Teacher training school	MULO, ULO, MAVO
		VMBO vocational training program
		VMBO theoretical or combined program
		MMS (Intermediate girls' school)