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# THE ANALYSIS OF THE INFLUENCE OF RELIGION ON ECONOMIC GROWTH IN THE CONTEXT OF MAX WEBER'S VIEWS

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## 1. INTRODUCTION

Certainly, the success that Western Europe has achieved in building capitalism and in the growth of social welfare has led to the constant search for the model of factors of economic growth and development. The growth rate of national income is essentially influenced by two groups of factors: the accumulation of production factors resulting in the increase of human skills, and the ability to effectively use the possessed resources. Technology, institutional development, geographical location are also important determinants affecting economic development. A more controversial and questionable factor may be the affiliation to and profession of a particular religion.

On the one hand, there are attempts to examine the influence of religion on the increase in the level and dynamics of economic growth in macro terms, as well as the impact of religion on an individual worshipper in defining his character traits and attitudes that influence the formation of *Homo economicus* (Höhener, and Schaltegger 2012). On the other hand, the religious variable is treated as a variable depending on the level of economic development (the level of secularisation).

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In the nineteenth and early twentieth centuries German scientists, among others Karl Marx, Max Weber, and Werner Sombart, played a special role in the assessment of the impact of religion and church on the construction of the capitalist order. Their views on the issue of religion were radically different, but undoubtedly they influenced subsequent generations of economists who, using various research methods, including econometric analysis, have tried to assess the significance of the 'religious variable' in generating economic growth.

Weber's thesis assumes that religion affects the personality traits and mentality of the individual, which in turn has had a significant impact on the entire economy. Weber described the development of capitalism as a gradual process of rationalisation. The process of rationalisation growth was a combination of professed religion and economic development. In this respect, Weber saw the special significance of reformed religions, including Calvinism. Although the thesis advanced by Weber is already over a hundred years old and has had many different interpretations, it still raises many controversies and doubts.

The author set himself the goal of determining whether, according to M. Weber's thesis, Protestantism had an impact on the economic growth of the German Reich?

To this end, using the previously developed GDP level model, the author included the religious variable (the number of Protestants) in the study of its relationship to the economic growth of the German Reich in 1879–1910 (Myszczyzyn 2013, Myszczyzyn 2016). Protestantism was the dominant religion in Germany, hence affecting the individual characteristics of worshippers (savings, mutual assistance) it hypothetically might have influenced the pace of economic growth.

The following research hypothesis was assumed: the Protestant religion was an important factor influencing the economic growth of the German Reich (1879–1910). Assuming that the religious variable is important, it can be treated only as one of many factors of Germany's economic growth.

In this work, the author only tries to determine the influence of religion (as an independent variable) on economic growth, while he does not consider equally important issues as demand, supply of religion, including market analysis. The article should be treated as a preliminary study in this respect, which will be developed in the future by adding further factors of economic growth.

## 2. THE DISPUTE ABOUT THE INFLUENCE OF RELIGION ON THE DEVELOPMENT OF CAPITALISM. KARL MARX, MAX WEBER, WERNER SOMBART

The three well-known German economists had a very different assessment of the importance and the influence of religion on economic life.

Karl Marx (1818–1883), assessing the influence of religion on the development of capitalism, referred to the criticism of the influence of Christianity in this area formulated by Bruno Bauer and Ludwig Feuerbach (Feuerbach 1841, Bauer 1843, Stirner 1845)<sup>1</sup>. These young Hegelians believed that religious content was only a reflection of human nature. Marx added: *‘Der Mensch macht Religion, die Religion macht nicht den Menschen’* (‘Man creates religion, religion does not create man’), *‘Religion ist der Seufzer der bedrängten Kreatur, das Gemüt einer herzlosen Welt, wie sie der der Geistloser Zustände ist. Sie ist das Opium des Volkes’* (‘Religion is the repulse of a persecuted being, the mind of a heartless world, like the spirit of a soulless state, It is »like« an opium for the nation’) (Kruhöfer 2002: 47–48). Although Marx despised religion, it cannot be said that it was irrelevant to him and his relatives. His family had been professing Judaism for hundreds of years, and only his father changed his religion to Protestantism.

Marx, presenting the thesis of economic determinism, treated religious and cultural issues as a superstructure through an economic base.

Max Weber (1864–1920) opposed Karl Marx’s theses. Certainly, Max Weber’s views were influenced by his upbringing and family relationships. His mother Helena, maiden name Fallenstein (1844–1919), who was a Protestant, at the same time explored her faith through personal loyalty to God that gave her the power to live. The son, after a serious illness in childhood, remained under a special care of his mother. As he said about himself, he was the son of his mother (*‘Muttersohn’*). His mother advised him until the end of his life, influenced his mood, warned him like a child against threats, accompanied him during his travels. In addition, the mother devoted herself fully to household work, bringing up children (eight), and she was reluctant to share her domestic duties with servants.

His father, Max senior (1836–1897) – a Prussian politician, was not a practicing Christian, he saw too much mystification in religious ceremonies and believed that they forced people to be obedient.

<sup>1</sup> Both are classified as so-called left Hegelians (young Hegelians).

Young Max felt a Prussian and lived in times when the importance of the Kingdom of Prussia grew in the struggle for the unification of Germany, and because of the Protestant religion the state was in a way connected with the throne and the altar of faith (state Protestant religion) (Kaesler 2014: 21 ff.). It shaped his later views.

In his book *The Protestant Ethic and the Spirit of Capitalism* (*Die protestantische Ethik und der Geist des Kapitalismus*) (1905, 1930) Weber argued that the economic calculation used by merchants and traders had a fundamental impact on rationality in the sphere of management, policies (e.g. trade policy), spreading to other spheres of the economic life of society. Capitalism was the highest form of this rationality. Weber calls capitalism ‘the most fateful force in our modern life’ (Weber 2010: 8). He noted that even the most unlimited greed for gain is not in the least identical with capitalism, and is still less its spirit. He defines capitalism as ‘the pursuit of profit, and forever renewed profit, by means of continuous, rational, capitalistic enterprise’. ... ‘In a wholly capitalistic order of society, an individual capitalistic enterprise which did not take advantage of its opportunities for profit-making would be doomed to extinction’. Weber defined the word capitalistic as ‘an economic action resting on the expectation of profit by the utilisation of opportunities for exchange, thus on (formally) peaceful chances for profit’ (Weber 2010: 8–9).

Weber assumed that religiosity was an independent variable that could have an impact on economic results achieved on a macro scale, and thus on economic growth and development (social welfare).

He pointed out that religious beliefs are not unrelated to the economy, and the cultivation of personal traits such as work ethics, honesty (and at the same time trust), frugality, charity, pursuing the goals assumed by the individual with the assumption of a certain risk can positively affect the entire economy. In contrast to Marx, he assumed that religion can affect the economy through the strength of rationality. Hence the attempt to determine the relationship between professed religions and the economy.

In a special way, in his book, Weber gave examples of the behaviour of the followers of particular factions of the Christian religion<sup>2</sup>. He indicated how important it is to define the profession and professional work for individual Christian religions, for instance for M. Luther (1483–1546) work meant service for the glory of God, and for Calvinism economic success was a sign

<sup>2</sup> These arguments were undoubtedly strongly influenced by M. Weber’s three month stay of in the USA (1904) at the world exhibition in St. Louis. Thanks to W. E. Burghardt Du Bois, Weber got to know the situation of the Afro-American population, their education, etc.

of the vocation (predestination). At the same time, in many places in his book, Weber showed how the reformed churches affected human behaviour and temporal affairs in contrast to the Catholic religion: 'The Catholic is quieter, having less of the acquisitive impulse; he prefers a life of the greatest possible security, even with a smaller income, to a life of risk and excitement, even though it may bring the chance of gaining honour and riches. The proverb says jokingly, "either eat well or sleep well". In the present case the Protestant prefers to eat well, the Catholic to sleep undisturbed' (Weber 2010: 27).

Weber's insights lead to the observation that the followers of the Protestant religion, especially the followers of Calvinism, had fundamentally influenced the economic development of Western Europe countries and the USA. Weber gives an example of their positive impact on the economies of the United States, England and the Netherlands.

Weber's thesis regarding the influence of the Protestant religion on economic growth may raise doubts and is not without many flaws. As Karl-Heinz Brodbeck notes, however, Weber limits rationality to the Protestant style of life. His observations regarding Confucianism, Buddhism, and Hinduism can only be a confirmation of an erroneous thesis; Weber believed that, for example, India would not be able to generate real economic growth (Brodbeck 2006). In many places of Weber's work one can feel great reluctance towards Catholicism and individual sacraments. He writes about the sacrament of penance:

'The rationalisation of the world, the elimination of magic as a means to salvation, the Catholics had not carried nearly so far as the Puritans (and before them the Jews) had done. To the Catholic the absolution of his Church was a compensation for his own imperfection. The priest was a magician who performed the miracle of transubstantiation, and who held the key to eternal life in his hand. One could turn to him in grief and penitence. He dispensed atonement, hope of grace, certainty of forgiveness, and thereby granted release from that tremendous tension to which the Calvinist was doomed by an inexorable fate, admitting of no mitigation (...) The God of Calvinism demanded of his believers not single good works, but a life of good works combined into a unified system' (Weber 2010: 83–84).

Referring to the sacrament of penance it would be appropriate to evoke the crucifixion of Christ and the very fact that the follower of the Catholic religion is uncertain about the forgiveness of sins and dispensed atonement.

In search of factors conducive to the creation of capitalism, it is impossible not to mention another German scientist, a representative of

the younger German historical school: Werner Sombart (1863–1941). Max Weber's colleague believed that the Protestant religion was not a driving force (spirit) of capitalism at all. He reminded that Protestant religions (including Calvinism) in the initial phase of their formation were hostile to capitalism itself, thus it is difficult to think that they had a positive impact on the development of the spirit of capitalism. At the same time, he indicated that the development of capitalism (including British capitalism) was probably influenced by completely different factors than Calvinism and the English-Scottish version of it, that is puritanism (Sombart 1920: 323 ff.).

Starting chapter 22 of his work *Der Bourgeois* W. Sombart wrote '*Der Protestantismus bedeutet zunächst auf der ganzen Linie eine ernste Gefahr für den Kapitalismus und insbesondere die kapitalistische Wirtschaftsgesinnung*' (Protestantism means first of all a serious threat to capitalism, and especially to the capitalist economic mentality) (Sombart 1920: 323).

At the same time, following the scientific achievements of Sombart, it should be added that he noticed the role of the Jewish religion and Jews themselves in the development of capitalism. He presented a controversial thesis that '*Amerika in allen seinen Teilen ist Judenland*' ('America in all its parts is a Jewish state'). He recalled the merits of Jews in the development of capitalism and their contribution to incorporating the American continent into the European economic system (Sombart 1911: 31–32).

After reading W. Sombart's work M. Weber asked 'What were the distinctive economic achievements of Judaism in the Middle Ages and in modern times? Moneylending, from pawnbroking to the financing of great states, certain types of commodity business, particularly retailing, peddling, and produce trade of a distinctively rural type; certain branches of wholesale business...'. He added that in the Jewish activity there was no significant feature of modern capitalism – the organisation of industrial production in domestic industry and in the factory system (Weber 2002: 466–487).

As it was shown above religion was assessed differently by K. Marx, M. Weber and W. Sombart; the first of them treated religion as a superstructure, Weber thought that reformed religions played an important role in the process of rationalisation and development of the spirit of capitalism, Sombart stressed the importance of the Jewish religion.

### 3. RELIGION AS A SPECIFIC GOOD – RESEARCH RESULT REVIEW

Since the times of Adam Smith worshippers have been perceived as members of an economic club. Belonging to a religious community both exerts influence on the individual behaviour of the members (by strictly defined rules, participation in rites, penalty for violation of the rules, perception of others) and also affects the whole social group, being an important element of social capital.

In economic modelling religion is treated as a specific good. A single person chooses a particular religion, which is also connected with the participation of that person in religious practices. From an economic point of view, both the costs and benefits of religious affiliation in the aspect of multiplying social welfare should be considered (Iannaccone, Finke, and Stark 1997: 350–364).

In the sense of new institutional economics, religion is something that creates a structure and is characterised by informal rules. Thus, religion, apart from factors such as manners, customs, tradition, is an important social factor, in addition deeply rooted in the studied community and affecting its development (Hoffmann 2012: 23–58)<sup>3</sup>. Apart from this, religion is not subject to frequent changes, hence it is a factor taken for granted (Williamson 1998: 23–58).

Essentially, religion can affect the economy through two channels:

- (indirect) impact on the person's individual traits and mentality. Aggregation of these features at the social level may affect economic values, including economic growth;
- direct influence of religion on conduct among people, and affiliation to religion strengthens economic cooperation between members of the community (Höhener, and Schaltegger 2012).

It should also be emphasised that various scientific studies on the influence of religion on individual behaviour as well as the verification of Max Weber's thesis have led to various conclusions.

For example, the following relationships between the studied religion and individual characteristics of its followers have been found:

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<sup>3</sup> As Robert Hoffmann shows, despite the emergence of more and more secular attitudes, religion still plays a significant role in the twenty first century – for example, in 2010 half of Americans surveyed thought that religion was very important in their lives. This assessment has basically remained unchanged for 40 years. Moreover, other studies prepared by the Bertelsmann Foundation proved that 62% of Americans considered themselves very religious.

- negative correlation between personal income and religious affiliation (Lipford, and Tollison 2003: 249–260);
- higher correlation between religious affiliation (Catholics and Jews) and personal income than in the case of Protestants (Steen 2004: 572–581);
- positive correlation between the percentage of Protestants and the number of suicides (Becker, and Woessmann 2011);
- positive (strong) correlation between religious affiliation and tax morality (propensity to pay taxes). Differentiated correlation coefficient, but always high for particular denominations (Torgler 2006: 81–109);
- positive influence of religiosity on propensity to save, attitude to cooperation, women’s rights, etc., and thus a positive impact on economic growth (Guiso, Sapienza, and Zingales 2003: 225–282);
- positive influence of the Catholic religion on subjective satisfaction with life, health, family relations, lower unemployment, creation of social ties in comparison with other citizens (Tao, 2008: 905–919);
- positive influence of religiosity (in general and considering particular denominations) on the level of satisfaction in comparison to non-believers (Steiner, Lienert, and Frey, 2010: 9–24).

Contemporary scientific research aimed at determining the interdependence between economic growth and the religious variable, (i.e. indirect influence of religion), was conducted, among others by: Luigi Guiso, Paula Sapienza and Luigi Zingales. They came to the following conclusions:

- religiously active citizens are usually little tolerant and have conservative views, e.g. regarding the role of women in society;
- religiously oriented citizens emphasise that people are naturally lazy and do not have enough willpower. In particular, vanity of man is stressed in Protestantism;
- Christian religions have a positive impact on economic growth, Islam – negative;
- Protestants have more confidence in other people and institutions compared to Catholics. They are more willing to pay taxes;
- Catholics more than Protestants support private property, property also plays a serious role in Hinduism, and the smallest in Islam;
- Jews are the most willing to pay taxes and are opposed to tax evasion, followed by Protestants, Hindus, and Catholics take the last place;
- the least willing to give bribes and other financial benefits are Buddhists, then Protestants and followers of Islam, Catholics close the list;
- Catholics have a positive attitude to the rules of competition in the economy, more than Protestants.

The authors conclude that religion exerts a positive influence on economic growth, but at the same time emphasise very large diversification of individual features affecting the level of economic growth, which also have a connection with religion. This does not allow them to easily indicate which religion has a decisive influence on the construction of economic prosperity. Certainly, Christian religions exert more positive influence on economic growth than Islam. The authors distance themselves from concluding which of the Christian religions exerts a greater influence on economic growth (Guiso, Sapienza, and Zingales 2003: 225–282).

Horst Feldmann from the University of Bath in UK conducted another study, concluding that Protestant countries are characterised by a higher rate of economic activity (Dambeck 2007). He showed, using statistical data, including the correlation and regression calculus, that in the Protestant countries the professional activity rate is higher on average by 6%; what is more, among women the ratio is higher even by 11%. He adds that among women of other denominations (including Catholics and Muslims), finding a job is often not worth the effort. Moreover, in employees in the Scandinavian countries, the United Kingdom and the USA, one can sense the ethics of work, discipline, willingness to work and supposedly these features are influenced by Protestantism. Bearing in mind the weaknesses of his research, Feldmann adds that despite these conclusions his thesis cannot be confirmed in former East Germany (where Luther lived), and Catholic Bavaria. Probably it would be difficult to confirm this thesis in the (other) former provinces of Prussia. A big drawback of Feldmann's research is the fact that he only tried to show the relationship between Protestantism and professional activity in particular Protestant countries, omitting the use of the identical modelling for Catholic and Muslim countries.

In 2001 Delacroix and Nielsen carried out research on Weber's thesis. The researchers considered statistical data from western European countries from the end of the eighteenth century. They investigated how the religious variable (the percentage »%« of people professing the Protestant religions) is correlated with Protestant attitudes (e.g., propensity to savings, setting up stock exchanges, extension of the railroad network, social distribution of labour »reducing employment in agriculture at the expense of industry and services«), and the development of capitalism. Contrary to theses advanced by Weber the researchers did not prove a significant correlation between Protestantism and: the level of social income per capita, founding of stock exchange, social distribution of labour. The negative correlation coefficient between Protestantism and the pace of railway network expansion was

a surprise. The only significant correlation existed between Protestantism and an increase in bank deposits, which could be interpreted as the fact that the followers of reformed religions were characterised by a greater propensity to save (Delacroix, and Nielsen 2001: 509–553).

Shawn F. Dorius and Wayne Baker conclude, however, that Weber's hypothesis should be reoriented in such a way that the values of the laity and not only of Protestantism and other religions are referred to in defining changes in the mentality of people (Dorius, and Baker 2012, McCleary, and Barro 2009).

#### 4. RELIGIOUS AFFILIATION ON THE EXAMPLE OF THE GERMAN REICH AND THE KINGDOM OF PRUSSIA (1871–1910)

At the beginning of the twentieth century 90 million followers of Protestantism and 173 million Catholics lived in Europe (*Informationen zur politischen Bildung [Information on political education]* No. 315/2012).

In the German Reich created on the initiative of Prussia in 1871 out of 41,058,792 residents, nearly 25.6 million people declared their affiliation to the Protestant denominations, about 14.9 million were Catholics, there were 82 thousand followers of other Christian religions and over 512 thousand of the Jewish religion. The Kingdom of Prussia was the largest national state that was part of the German Empire. Prussia with a total area of 348,779.9 km<sup>2</sup> accounted for 64.49% of the total area of the Reich, and its population of 24,691,085 constituted 60.14% of the population of the Reich (*Statlisches Jahrbuch für das Deutsche Reich [Statistical Yearbook of the German Reich] 1914:1*).

Analysing the statistics of religious believers in Prussia in 1871:

- 64.97% of citizens were the followers of the Protestant religion;
- 33.49% of citizens declared the Catholic denomination;
- 0.22% of citizens were other Christians;
- 1.32% of citizens professed Judaism.

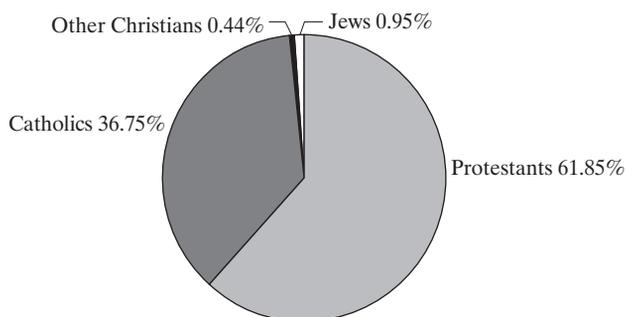
Out of 12 Prussian provinces, 6 provinces were located entirely (provinces: Posen, Westpommern) or partially (Pommern, Ostpommern, Schlesien, Branderburg) on the territory of current Poland. Analysing the religious diversification of this part of Prussia, it is easy to notice that Christianity was the dominant religion. On the other hand, two rites dominated in the Christian religion: Protestant and Catholic, while there were nearly twice as many followers of the first.

According to statistical data taken from the Statistical Yearbook of Prussia (*Statistisches Jahrbuch für den Preussischen Staat [Statistical Yearbook*

of the Prussian State] 1903 1904), the followers of Protestantism dominated in provinces: Pommern, Westpommern, Brandenburg, (e.g. in the district of Gąbin 96.89% of the total population, Szczecin 96.57% of the total population), in turn, Catholics prevailed in the province of Posen, in the province of Schlesien in general Catholics also were in the majority, but there was a large variation depending on the district, for example in Legnica Protestants constituted 81.85% of the total population, while in the district of Opole Catholics accounted for 90% of the total population. In the Westpommern province, the followers of the two rites were in similar number; except that in the region of Gdańsk Protestants constituted about 49.5% of the total population, Catholics 48.1%, while in the district of Kwidzyna Catholics constituted 53.48% of the total population, and Protestants 44.68%. In total, in the Westpommern province there were over 800,000 people who were Catholics and over 730,000 residents professing the Protestant religion (*Statistisches Jahrbuch für den Preussischen Staat [Statistical Yearbook of the Prussian State] 1903 1904: 15*). Analysing the percentage share of particular denominations in the period 1871–1910, both for the German Reich and the Kingdom of Prussia, these proportions changed slightly, but nevertheless in favour of Catholics. In 1910 Protestants constituted 61.5% of the total number of believers in the entire Reich (decrease by 1.1% in relation to 1871), Catholics 36.6% (increase by 0.72% in relation to 1871), Jews 0.95% (decrease by 0.29% in relation to 1871) and other Christians 0.44% (increase by 0.23% in relation to 1871) (Figure 1).

Figure 1

The followers of major religions in the German Reich in 1910 (%)



Source: Own study on the basis of: *Statistisches Jahrbuch für das Deutsche Reich [Statistical Yearbook of the German Reich] 1917*, Herausgegeben vom Kaiserlichen Statistischen Amt, Berlin: Verlag von Puttkammer & Mühlbrecht, p. 1, 13.

In 1910 in Prussia, the largest state of the Reich, Protestants accounted for 61.82% of all believers (decrease by 3.15% compared to 1871), Catholics 36.31% (increase by 2.82% compared to 1871), Jews 1.04% (decrease by 0.28% compared to 1871) and other Christians 0.47% (increase by 0.25% compared to 1871).

The analysis of statistics from 1871–1910 for the German Reich proves that despite the increase in the absolute number of the followers of Christian religions (Catholics and Protestants), the percentage of Protestants decreased by 0.79%, while the percentage of Catholics rose by 0.78% at the same time.

## 5. STATISTICAL ANALYSIS – THE INFLUENCE OF RELIGION ON ECONOMIC GROWTH. GDP LEVEL MODEL

In order to establish the relationship between economic growth measured by the level of GDP and independent variables describing the German economy, the author used the model he had developed earlier, which concerned the estimation of the impact of, among others, a railway variable on the economic growth of Germany. The author used the following collected statistical data describing the state of the German economy:

- percentage of the number of people employed in agriculture in relation to the employed in the entire national economy (%) (hereinafter referred to as AW),
- level of emigration (in thousands of people) (hereinafter referred to as  $EM_{t-1}$ ),
- level of investment in the economy (in million RM) (hereinafter referred to as I),
- number of marriages entered into (in thousands) (hereinafter referred to as MA),
- number of pupils and students (in thousands) (hereinafter referred to as  $ST_{t-1}$ )
- number of Protestants (in thousands of people) (hereinafter referred to as PR) (*Statistisches Jahrbuch für das Deutsche Reich [Statistical Yearbook of the German Reich] 1880–1913, Statistisches Jahrbuch für den Preussischen Staat [Statistical Yearbook of the Prussian State] 1903 1904*, Hoffman, 1965: 352–354, 368–370, Maddison [www.sais-jhu.edu/library/subjectguides/stats.htm](http://www.sais-jhu.edu/library/subjectguides/stats.htm)).

The aim of the inclusion of the religious variable was to verify the research hypothesis assumed by the author, as well as to expand the model and further search for factors of German economic growth in the nineteenth and early

twentieth centuries. Due to the availability of statistical data on individual religions published in *Statistisches Jahrbuch für das Deutsche Reich* [*Statistical Yearbook of the German Reich*] (years 1880–1913) the author analysed the time series of 1879–1910 (Myszczyszyn 2016: 475–484, Mata, Love 2008: 461–492).

In the proposed model, the GDP level was an endogenous variable, while the other used variables were explanatory.

The function had a general form:

$$\ln Y_t = \beta_0 + \sum_{i=1}^n \beta_i \ln x_{i,t} + \varepsilon_t$$

where:

$Y_t$  – GDP of Germany (1879–1910),

$x_{it}$  – selected explanatory variables characterising the economy of Germany, described under the equation,

$\beta_i$  – structural parameters,

$\beta_0$  – the constant term,

$\ln$  – natural logarithm,

$\varepsilon_t$  – random component.

In this approach, the structural parameter  $\beta_0$  determines the flexibility of a dependent variable with respect to explanatory variables. It describes a relative change of the GDP level (in USD 1990) caused by a relative change of only one of the distinguished factors by 1%, with a set level of other factors (*ceteris paribus*).

At the same time, it was assumed that the critical value of the correlation was:

$$r^* = \sqrt{\frac{t_{\alpha, N-2}^2}{N-2 + t_{\alpha, N-2}^2}} \approx 0,344$$

where:

$t_{\alpha, N-2}^2$  – the value of the statistics read from the Student's  $t$ -distribution tables for the significance level of 0.05 and (N-2) degrees of freedom.

All exogenous variables (including the religious community) were significantly correlated with the explanatory variable.

At the same time, the stationarity of individual variables was examined using two tests: the extended Dickey Fuller test (ADF), and the Kwiatkowski-Philips-Schmidt-Shin test (KPSS). The ADF test verifies the (null) hypothesis about the occurrence of a unit root. The lack of grounds for rejecting it

indicates the non-stationarity of the series. The KPSS test indicates the stationarity of the series when there is no basis for rejecting the null hypothesis. It was assumed that the unit root test and stationarity test are complementary to each other and should be used in parallel (Kębłowski 2003: 87–104).

The results of the integration analysis indicated the stationarity of the integrated variables at level 0 for: the level of investment and the level of emigration and the first differences for: the level of GDP, the level of employment in agriculture, the number of marriages, the number of pupils and students, the number of Protestants.

The below figure (Figure 2) presents the dependent variable – first differences of GDP of Germany.

Figure 2

First differences – the GDP of Germany variable (1879–1910)



Source: own calculation on the basis of: A. Maddison, *Historical Statistics for the World Economy: 1-2003 AD*, [www.sais-jhu.edu/library/subjectguides/stats.htm](http://www.sais-jhu.edu/library/subjectguides/stats.htm) [02.12.2015].

## 6. THE OBTAINED RESULTS AND THEIR ANALYSIS

The least squares method (LSM) was used to estimate the structural parameters of the above model.

The GDP level model taking into account the religious variable – the number of Protestants (variable PR):

$$\ln Y_t = 0,171 - 6,146 \ln PR - 0,021 \ln EM_{t-1} - 0,89 \ln AW$$

$$|t| \quad (4,08) \quad (3,06) \quad (3,70) \quad (2,94)$$

$$R^2=0,3960 \quad \text{Adjusted } R^2=0,3313 \quad S_{EE}=1,60 \quad DW=1,97$$

where:

- $Y_t$  – increases in Germany's GDP in 1879–1910,  
 PR – increase in the number of followers of Protestantism,  
 $EM_{t-1}$  – emigration level (t-1) (in thousands of people)<sup>4</sup>,  
 AW – increase in the number of people working in agriculture.

For the above modelling step,  $R^2$  determination coefficient was 39.6%, and its adjusted value amounted to 33.013%.

The significance test was based on the distribution of Student's t-statistics. Inequality is the result for three parameters  $|t| > t_\alpha$  ( $|t| > 2,0484$ ). The variables of the investment level ( $|t|=0,768$ ), increase in the number of marriages ( $|t|=0,414$ ), increase in the number of pupils and students ( $|t|=0,438$ ), turned out to be insignificant.

To test homoscedasticity, the Breusch-Pagan test was done. The value of LM statistics 2.98, on the basis of the empirical level of significance (value  $p > 0.05$ ) equal to 0.39 there are no grounds for rejecting  $H_0$  hypothesis about the occurrence of homoscedasticity of model residuals.

The assessments of structural parameters for the above equation (assuming *ceteris paribus*) lead to the following conclusions:

- increase in the number of Protestants by 1% affected the decline in the growth of German GDP by about 6.146%!
- decrease in the level of emigration by 1% meant an increase in GDP growth by 0.02%,
- decrease in the percentage of people employed in agriculture by 1% affected the increase in GDP by 0.89%.

However, it should be added that both the percentage of people employed in agriculture and the level of emigration in the analysed period (1879–1910) basically had a tendency to decline, i.e. they influenced the growth of German GDP. On the other hand, the number of followers of Protestant religions (mainly due to a rise in the number of population) increased.

The obtained results confirm that, according to the assumed research hypothesis, the religious variable turned out to be a significant variable affecting Germany's GDP.

<sup>4</sup> Time delays (t-n) were used in the model for selected variables (level of emigration, number of marriages) in order to eliminate the endogeneity of these variables.

Analysing the above equation, it should be noted that the following factors were important in influencing the explanation of the endogenous GDP variable in the period 1879–1910:

- demographic factors, including the level of emigration analysed by the author;
- the importance of human capital development as a percentage of the number of pupils and students ( $ST_{t-1}$ ) turned out to be insignificant, which may be a big surprise, because in the case of the research carried out for the period 1850–1913 the author obtained a positive influence of this factor (Myszczyzyn 2013). It is similar in the case of the variable of marriages entered into (in thousands) (hereinafter referred to MA);
- the decline in employment in agriculture proved to be significant as in the previous research of the author (for the years 1850–1913). In German agriculture there was still a significant percentage of people employed in the national economy in the total number of employees; for example, in 1913 it was close to 35% of the total number of employees. There were many reasons for this condition, including the character of provinces of the Eastern Reich, which were supposed to serve as a resource base. Another possible reason was a change in commercial policy, among others, an alliance of junkers and industrialists (the iron and rye union), as a result of which cereal farming was still profitable, and the outflow of labour from agriculture to the industry was relatively small.
- the number of followers of Protestantism (PR), although a significant variable, the increase in the number of followers affected the decline in GDP growth.

## CONCLUSIONS

The GDP growth rate is essentially influenced by two groups of factors: accumulation of production factors (resources), in particular manifested in the level of investments in physical capital and investments in human capital (the level of education, number of students, access to education, etc.) resulting in the increase of human skills. Another group is the ability to effectively use the resources. Technology, institutional development, geographical location are also important determinants affecting economic development.

In this context, Max Weber's controversial thesis about the positive influence of Protestantism, including Calvinism on the development of capitalism, was subject to verification for Weber's homeland – Germany.

Using the available statistical data about the economy of the German Reich (1879–1910) and the econometric model developed by himself, the author included the religious variable (especially the increase in the number of Protestants) in his analysis.

The results of the research indicate that the religious variable turned out to be (along with other variables) an important variable in the model of Germany's GDP level in 1879–1910. It may be intriguing that it affected negatively the growth of Germany's GDP considering that the number of Protestants increased, but in view of the rapid demographic growth, the percentage of Protestants in relation to the number of followers nevertheless decreased. It can be added that the (adjusted) coefficient of determination  $R^2$  amounted to 33.13%, which proves that the level of GDP was also influenced by other factors not taken into account by the author in the model. It seems that W. Sombart was right in pointing out that at the beginning of the twentieth century many factors influenced social welfare.

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## THE ANALYSIS OF THE INFLUENCE OF RELIGION ON ECONOMIC GROWTH IN THE CONTEXT OF MAX WEBER'S VIEWS

### Summary

The basis of Weber thesis is presented in the work *The Protestant Ethic and the Spirit of Capitalism*. Analysing the development of capitalism Weber connected it, among others, with an increase of rationality caused by a particular religion. He stated that an increase in ascetic Protestantism (including Calvinism), and in particular a set of values and beliefs about work, savings, investment, and multiplying wealth were essential to the creation of modern capitalism.

The author conducted a verification of Weber's thesis and used his own econometric model for the economy of Germany. The Protestant religion, in addition to the level of emigration, the proportion of people working in agriculture, was important for the creation of social welfare (GDP). This is a negative relationship as an increase in the number of Protestants led to a decrease in GDP growth. At the same time, it should be noted that the percentage of the number of Protestants in the German Reich decreased during the analysed period. The relatively low coefficient of determination also indicates that the model explains 33.13% of the cases.

Key words: economic growth and Protestantism, the German Reich, Max Weber, cliometrics

### ANALIZA WPŁYWU RELIGII NA WZROST GOSPODARCZY W KONTEKŚCIE POGLĄDÓW MAXA WEBERA

#### Streszczenie

W dziele *Etyka protestancka a duch kapitalizmu* jest przedstawiona podstawa tezy Webera. Analizując rozwój kapitalizmu Weber wiązał go m.in. ze wzrostem racjonalności wywołanej konkretną religią. Uznał, że wzrost ascetycznego protestantyzmu (w tym kalwinizmu), a szczególnie zbiór wartości i przekonań dotyczący pracy, oszczędności, inwestycji oraz pomnażanie bogactwa, był niezbędny do powstania nowoczesnego kapitalizmu.

Autor przeprowadził weryfikację tezy Webera i wykorzystał własny model ekonometryczny dla gospodarki Niemiec. Religia protestancka, obok poziomu emigracji, odsetka pracujących w rolnictwie, była istotna dla tworzenia społecznego dobrobytu (PKB). Jest to zależność ujemna, gdyż przyrost liczby protestantów prowadził do spadku przyrostu poziomu PKB. Należy jednocześnie zauważyć, że odsetek liczby protestantów w Rzeszy Niemieckiej w analizowanym okresie spadał. Relatywnie niski współczynnik determinacji wskazuje też, że model wyjaśnia 33,13% przypadków.

Słowa kluczowe: Max Weber, wzrost gospodarczy a protestantyzm, Rzesza Niemiecka, kliometria

#### АНАЛИЗ ВЛИЯНИЯ РЕЛИГИИ НА ЭКОНОМИЧЕСКИЙ РОСТ В КОНТЕКСТЕ ВЗГЛЯДОВ МАКСА ВЕБЕРА

##### Резюме

Суть тезиса Вебера представлена в труде *Протестантская этика и дух капитализма*. Вебер, анализируя развитие капитализма, устанавливает его связь, в частности, с ростом рационализма, вызванным определенной религией. Он считает, что рост аскетического протестантизма (в том числе кальвинизма), и в особенности набор ценностей и убеждений, касающихся труда, сбережений, инвестиций и умножения богатства, необходимы для формирования современного капитализма.

Автор провел верификацию тезиса Вебера и применил собственную эконометрическую модель для экономики Германии. Протестантская религия, кроме уровня эмиграции, влияющего на процентное количество людей, работающих в сельском хозяйстве, оказалась существенной в вопросе создания социального благосостояния (ВВП). Эта зависимость носит отрицательный характер, поскольку увеличение количества протестантов привело к снижению темпов роста ВВП. Следует в то же время заметить, что процентное количество протестантов в Германском рейхе в анализируемый период снизилось. Относительно низкий коэффициент детерминации также указывает на то, что модель позволяет выявить 33,13% случаев.

Ключевые слова: Макс Вебер, экономический рост и протестантизм, Германский рейх, клиометрия.

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