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Intangible factors and productivity: Evidence from Europe at the regional level

Anneli Kaasa

School of Economics and Business Administration, University of Tartu

corresponding e-mail: anneli(dot)kaasa[at]ut(dot)ee
address: J. Liivi 4-301, 50409 Tartu, Estonia

Abstract: This study investigates how a region's labour productivity could be influenced by intangible factors such as social capital, government quality, cultural dimensions and religion - factors that have not received much attention in the previous literature. As another novelty, regional-level data (78 regions of 22 European countries) were analysed. In order to take into account the relationships between various factors of productivity, the structural equation modelling approach is used enabling to find out both direct and indirect effects. The results showed institutional trust and civic participation to be the most important for productivity. Individualism appeared to have a positive and masculinity and power distance a negative total effect on labour productivity.

JEL Classifications: J24, K40, O40, R11

Keywords: Productivity, social capital, institutional quality, culture, religion, Europe
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1. Introduction

Productivity is one of the most important determinants of economic growth and the welfare of people. Hence, there is no doubt that the possible determinants of productivity deserve to be studied. When looking at the determinants of productivity at the aggregate (society) level, the literature has mainly focussed on factors like human capital, research and development (R&D), innovations etc. showing positive links between these factors, productivity and economic growth. However, it has been argued that these factors may not be sufficient for explaining differences in the levels of productivity in different countries (Sayes, 2011). Therefore, as also pointed out by Beugelsdijk & van Schaik (2005), the research has to go beyond these standard factors of productivity and explore other possible factors, such as so-called intangibles that nevertheless can be assumed to have an impact as well. These intangible factors include social capital, e.g. trust and networks, and institutional quality, such as the rule of law, political stability, regulatory quality or government effectiveness. In addition, there is one important background-forming phenomenon that has not received much attention in the literature, but is worthwhile to investigate as possibly affecting productivity. This phenomenon comprises people's values, beliefs, attitudes, behaviour, etc., often also referred to as culture. In addition, religion is something that often guides people's choices and behaviour.

So far, the research has paid little attention to those intangible factors in the context of productivity and even in the broader context of economic development and growth and not much empirical research can be found (Barro & McCleary, 2003; Gorodnichenko & Roland, 2010; Sharpe, 2004; Kaasa, 2016a; Kaasa, 2016b). Regarding social capital, the research has mainly focussed on trust and networks in general, but no further

investigation can be found of the various dimensions of social capital, such as institutional trust, civic participation, informal and formal networks as possible factors of productivity.

Regarding culture and religion, most of the studies have been limited to the ethnolinguistic and religious fractionalisation. However, fractionalisation does not say anything about culture itself. There are different concepts for describing and measuring culture available in the literature (for instance Hofstede, 1980; Schwartz, 1994; Inglehart &Baker, 2000; House et al., 2002). Also, there are many more aspects related to religion than fractionalisation, such as general religiosity, shares of different religious denominations, etc. With so many factors possibly affecting productivity, the relationships between those factors should also be considered. Furthermore, it is reasonable to assume that there may also be significant within-country differences in the social and cultural environments which could influence productivity differences in different regions (see, for example, Kaasa, Vadi, & Varblane, 2013; Kaasa, Vadi, & Varblane, 2014) and hence, the impact on productivity may differ significantly too. However, most of the literature on productivity focusses on the country level analysis (Dettori, Marrocu, & Paci, 2012; Artige & Nicolini, 2006). This article aims to address these shortcomings in the previous research.

The aim of the current study is to explore the possible impact of intangibles, such as social capital, institutional quality, culture and religion on the productivity levels of European countries at the regional level using structural equation modelling. More specifically, labour productivity as the most widely used measure of productivity is viewed as a dependent variable. Regarding intangible factors, this article brings together the factors analysed by Kaasa (2016a) and Kaasa (2016b) providing a more comprehensive view, taking also the possible relationships between the factors of productivity into account. Different social capital dimensions, such as general trust, institutional trust, informal and formal networks as well as regional government quality are included. Cultural dimensions analysed are based on Hofstede's (1980) concept and include power distance, uncertainty avoidance, masculinity and individualism. In addition to general religiosity, the share of hierarchical religion is included.

The data for social capital and for religion-related indicators came from the European Values Study (see EVS, 2010) and the European Social Survey (see ESS, 2008). Based on the initial indicators from these surveys, variables describing different components of social capital and religiosity were created with the help of factor analysis. In order to describe different aspects of institutional quality, the World Bank database of the Worldwide Governance Indicators (WGI) (The World Bank, 2014) is often used. Lately, new data in the form of the European Quality of Government Index have become available that also provide regional-level estimates corrected for the regional differences (Charron, Dijkstra, & Lapuente, 2014). The data for describing cultural dimensions came from Kaasa, Vadi, & Varblane (2014), who also used the ESS and EVS as initial data sources. The data for calculating labour productivity indicators as well as the data for the standard factors of productivity as control variables came from Eurostat. All these data sources enable to analyse European regions at the NUTS 1 level. 78 regions of 22 European countries are covered in this analysis. In order to take into account the relationships between the factors of productivity themselves as well, the structural equation modelling (SEM) approach is used.

This article is organised as follows. Section 2 presents the theoretical background and Section 3 introduces the data and operationalisation. Section 4 reports and Section 5 discusses the analysis and the results. Section 6 draws conclusions.

2. Theoretical background

There are various ways to define productivity (see, for example, Tangen, 2005). Here, productivity is understood as efficiency in production: the relationship between output and input, which can be expressed as an output-input ratio (Syverson, 2011). For this kind of a definition, the most widely used measure of productivity is labour productivity, although sometimes capital or materials productivity are also used (Syverson, 2011; OECD, 2001; Sharpe, 2004). At that, it has to be borne in mind that labour productivity as an output-input ratio does not reflect only the productivity of labour in terms of the capacities or efforts of the workers, but also, for instance, the availability and use intensity of other production factors or technical change (OECD, 2001; Sharpe, 2004). Productivity can be viewed at the firm level or at the aggregate (country, regional) level. In this article, the aggregate level productivity is analysed.

Regarding possible factors influencing productivity, innovation is commonly viewed as crucial for productivity (Crespi & Zuñiga, 2010; Peters, Lööf, & Janz, 2003; Hall, 2011; Sayes, 2011; Isaksson, 2007; Sharpe, 2004). Applying new technologies enables the use of production factors more effectively. Therefore, most studies analysing the determinants of productivity have included innovation and new technology. Another factor that is often analysed is R&D. For creating and applying new technologies, R&D is very important, as it forms new knowledge and leads to new ideas. R&D has been shown to be positively related to productivity (Crespi & Zuñiga, 2010; Griffith, Redding, & Van Reenen, 2004; Syverson, 2011; Isaksson, 2007).

Next, education is also considered to be an important factor of productivity. Education-related indicators have often been included when studying determinants of productivity and a positive relationship with productivity has been shown (Gorodnichenko & Roland, 2010; Yamamura & Shin, 2012; Ghulam, 2012; Sharpe, 2004; Isaksson, 2007). Well-educated workers are more likely to effectively use other production factors, and develop and apply new ideas. Education determines the economy's capacity to carry out technological innovations as well as the so-called absorptive capacity: the ability to adopt technologies that have been created and are already used by others (Isaksson, 2007; Sharpe, 2004; Ghulam, 2012).

Regarding intangible factors, first, social capital is a complex concept with many dimensions and definitions (see for example Adler & Kwon (2002) or Tamaschke (2003) for overviews of different definitions). Social capital can be studied at both the individual and society (country, regional) level. At the society level, social capital can be defined as 'features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit' (Putnam 1995). The society level productivity derives from the productivity of firms. Previous studies have shown that firm performance is closely related to the social capital of individuals working in firms (Burt, 2000). Hence, the social capital of a region can be viewed as a proxy for the social capital of the individuals working for the firms in that particular region.

The influence of social capital on productivity can be described as creating a favourable environment for economic performance. When analysing the impact of social capital on economic growth, innovation, or productivity, two important aspects of social capital are mostly examined in the literature: networks and trust (Dakhli & de Clercq, 2004; Knack & Keefer, 1997; Landry, Amara, & Lamari, 2002; Heliwell, 1996; Casey & Christ, 2005; Beugelsdijk & van Schaik, 2005; Jankauskas & Šeputienė, 2007). There are many mechanisms through which social capital may impact productivity (see Kaasa (2016a) for

an exhaustive overview). What is very often mentioned is that social capital helps the diffusion of information and knowledge (Jankauskas & Šeputienė, 2007; Sabatini, 2008; Yamamura & Shin, 2012; Di Guilmi et al., 2008; Grafton, Kompas, & Owen, 2004; Beugelsdijk & van Schaik, 2005). Trust also encourages co-operation between firms and hence allows a more effective use of resources (Bjørnskov & Méon, 2010; Beugelsdijk & van Schaik, 2005). Networks are claimed to have a synergy effect, bringing together skills and different ideas which may lead to radical breakthroughs that remarkably improve productivity (Subramaniam & Youndt, 2005; Kaasa, 2009). In a trusting environment workers tend to be more motivated (Jankauskas & Šeputienė, 2007; Sabatini, 2008; Di Guilmi et al., 2008), but social networks may also provide more control among colleagues and a higher quality of effort (Sabatini, 2008; Di Guilmi et al., 2008). Social capital has been claimed to lower uncertainty and transaction costs (Beugelsdijk & van Schaik, 2005; Bjørnskov & Méon, 2010; Lekovic, 2012; Jankauskas & Šeputienė, 2007). Trust within social networks serves as a substitute for a legal system, for example in contract monitoring and enforcement. This also means that investment decisions can be made using a longer time horizon and it is possible to invest in riskier, but eventually more productive projects (Bjørnskov & Méon, 2010).

Unfortunately, there are only a few studies that have empirically tested the impact of social capital on productivity at the societal level. Using a sample of 23 European countries, Jankauskas & Šeputienė (2007) found both trust and networks to have a remarkable positive relationship with labour productivity. At the same time, civism did not correlate with labour productivity in their analysis. Knack & Keefer (1997) analysed the data of 29 countries and found trust to have a significant positive correlation with output per worker, while the correlation with productivity was positive, but insignificant. Casey & Christ (2005) studied the states of the US and concluded no significant relationship between productivity and different social capital indicators. In a study of 67 countries by Bjørnskov & Méon (2010), the social trust indicator appeared to have a strong positive association with productivity. Kaasa (2016a) analysed data of 23 European countries at the regional level and found that institutional trust and civic participation both have a positive relationship with productivity, but found no significant impact of general trust, formal or informal networks. Hence, the empirical evidence concerning social capital and productivity is mixed.

In addition, the institutional environment or government quality should be considered as an important factor for productivity (Islam, 2008; Lio & Liu, 2008; Ghulam, 2012). There are many definitions of institutional quality, also often referred to as governance or governance quality (Kaufmann, Kraay, & Mastruzzi, 2010; UNPAN, 2007). This analysis is based on the approach of Kaufmann et al. (2010) which defines governance as the traditions and institutions by which authority in a country is exercised.

Regarding the impact of institutional quality on productivity, it is claimed to lower the transaction costs by securing property rights and enforcing contracts (Lio & Liu, 2008; Jankauskas & Šeputienė, 2007; Bjørnskov & Méon, 2010). Well-functioning institutions enable firms to spend more on production and technological improvement, and less on monitoring and securing. In this sense, institutional quality and social capital may be viewed as substitutes for each other (Jankauskas & Šeputienė, 2007): when there is less social capital, institutional quality should be better for keeping the transaction costs low; and when institutions perform poorly, social capital may be of great help. Institutions have also been viewed as being important in enhancing learning and spreading knowledge,

because leaving the provision of education and information to the private sector may not reach the social optimum (Isaksson, 2007).

The empirical evidence for addressing the impact of institutional quality on productivity mostly supports these theoretical considerations (Isaksson, 2007). For example, Jankauskas & Šeputienė (2007) analysed the data of 23 European countries and found different governance indicators to be positively and significantly related to labour productivity. Ghulam (2012) studied 14 Asian countries and found government effectiveness and regulatory quality to be positively correlated to the average labour productivity. In a study of 67 countries by Bjørnskov & Méon (2010), the legal quality and democracy indicators appeared to have a positive association with productivity. Hall and Jones (1999), after analysing 127 countries, concluded that differences in institutions and government policies are related to differences in the output per worker. In an analysis of 22 OECD countries, Salinas-Jiménez & Salinas-Jiménez (2006) showed different corruption indicators to be negatively correlated to the GDP per worker. Hence, the empirical evidence is much clearer in the case of institutional quality than in the case of social capital as a potential factor of productivity. However, the analysis of 23 European countries at the regional level by Kaasa (2016a) showed that the positive impact of government quality disappeared after including social capital indicators into the analysis.

Next, regarding culture, similarly to social capital, there are various definitions of culture (see, for example, Chanchani & Theivanathampillai (2002) or Hall (1980) for an overview). Here, a sociological approach is applied where culture can be defined as a set of shared values, beliefs and behaviours of a group of people, in this case of a country or region (Kaasa, Vadi, & Varblane, 2014). In order to operationalise culture, one possible approach that is widely used is to choose a set of dimensions that describe different aspects of culture and to view every country or region as a point in a multidimensional model. Many different sets of dimensions are available to classify culture (e.g. Hofstede, 1980; Schwartz, 1994; Inglehart & Baker, 2000; House et al., 2002). An overview can be also found in Taras, Rowne, & Steel. (2009). However, no systematic analysis of the relationship between culture and productivity based on any concept of culture can be found in the literature so far, except for Kaasa (2016b). Similarly to Kaasa (2016b), in the current article, Hofstede's (1980) original approach capturing cultural differences with the help of four dimensions - power distance, uncertainty avoidance, individualism-collectivism, and masculinity-femininity - is used as a basis. Although often criticised (see Chiang, 2005; Oyserman, Coon, & Kemmelmeier, 2002; McSweeney, 2002; Gooderham & Nordhaug, 2001 for examples) it is one of the most widely used concepts of culture and it can be viewed as a grounded approach for describing culture.

First, individualism has received most attention in the context of productivity and has been claimed to be the most important dimension in the economic context (Gorodnichenko & Roland, 2010; Gorodnichenko & Roland, 2011). Individualism (as opposed to collectivism) (IND) reflects the extent to which people prefer to act as individuals rather than as members of groups. In individualistic cultures, autonomy, individual freedom, initiative and rights are valued, whereas in collectivist cultures, close social relations are important (Papamarcos & Watson, 2006; Kaasa, Vadi & Varblane, 2014; Waarts & van Everdingen, 2005). In more individualistic cultures people are more achievement-oriented (Papamarcos & Watson, 2006; Gorodnichenko & Roland, 2010) and they have more motivation and reasons to expect compensation and recognition for inventive ideas which may increase productivity (Kaasa & Vadi, 2010; Shane, 1992; Herbig & Dunphy, 1998; Forson, Janrattanagul, & Carsamer, 2013; van Hoorn, 2014). Also, less

loyalty to organisations in more individualistic cultures may make the exchange and diffusion of information and knowledge easier (Kaasa & Vadi, 2010; Herbig & Dunphy, 1998; Isaksson 2007).

Second, power distance (PDI) describes the extent to which the unequal distribution of power and hierarchical relations are accepted in a culture (Papamarcos & Watson, 2006; Kaasa, Vadi, & Varblane, 2014). High power distance could hinder activities that could improve productivity, because diffusion of information may be constrained by the hierarchy (van Evergingen & Waarts, 2003). Also, in societies with high power distance, people tend to wait for action by the authorities rather than actively engage (Kaasa, 2015) and the powerful can be expected to be less willing to appreciate the initiatives of the powerless (Papamarcos & Watson, 2006). Third, uncertainty avoidance (UAI) shows the degree to which people feel threatened by uncertainty and ambiguity. In the case of high uncertainty avoidance, there is a strong need for order and rules, while in the case of low uncertainty avoidance, ambiguous situations are regarded as natural (Papamarcos & Watson, 2006; Kaasa, Vadi, & Varblane, 2014). In societies with higher uncertainty avoidance there may be more resistance to new technologies (Shane, 1993; Waarts & van Everdingen, 2005) while the reliance on rules may constrain the possibilities for creating new solutions (Kaasa & Vadi, 2010). At the same time, in societies with higher uncertainty avoidance, there is also a stronger tendency to protect intellectual property with patenting and that may encourage finding more productive solutions (Kaasa & Vadi, 2010). A smaller risk of dishonest practices enables more resources to be used for improving technology (Kaasa, 2016b). Last, masculinity (as opposed to femininity) (MAS) reveals the degree to which masculine values, such as orientation towards achievement and success, assertiveness and competitiveness, prevail over values like modesty and good relationships, caring, solidarity or tolerance (Kaasa, Vadi, & Varblane, 2014; Kaasa & Vadi, 2010). There are contradictory assumptions regarding masculinity and productivity (Kaasa, 2016b): although emphasising achievement may motivate people to work harder and find new and useful solutions, it may also be that the supportive climate of a more feminine culture makes workers feel more relaxed and thus more motivated.

Regarding empirical evidence, only a few studies can be found analysing the impact of individualism on productivity. Gorodnichenko & Roland (2010) found in their country-level analysis that both labour productivity and the TFP are positively and significantly influenced by individualism. Kaasa (2016b) analysed the data of 22 European countries at the regional level and found individualism to be positively and masculinity and power distance to be negatively related to labour productivity. Unfortunately, no other studies empirically testing the relationships between the described cultural dimensions and productivity could be found.

Next, religion-related aspects are viewed as factors of productivity separately from culture, although some authors argue culture to be preceding religion (see, e.g. Reimer, 1995; Hofstede, 1997) and others view religion as a source of culture (see, e.g. Schwartz, 2009; Aldashev & Platteau, 2014). The argumentation behind the impact of religion on productivity is mainly based on the concept of the Protestant work ethic, claiming that the spread of values such as hard work, honesty, responsibility etc. promoted by the Protestant religion led to the development of capitalism in the Protestant Europe (Altynbekov et al., 2013; Linz & Chu, 2013; Barro & McCleary, 2003; Forson, Janrattanagul, & Carsamer, 2013). The workers' values determine their motivation and interest in their duties and thus the work effort (Linz & Chu, 2013; Altynbekov et al., 2013). However, there is mixed empirical evidence about this logic (Mangeloja, 2003).

Concerning productivity determinants, Islam (2008), in his cross-country analysis, found that Protestantism as a dominant religion was negatively and the Muslim religion positively, although not significantly, related to productivity. Kaasa (2016b) confirmed that result with the analysis of 22 European countries at the regional level. However, recently evidence has indicated that a strong work ethic is not unique to Protestantism, but is related rather to general religiosity (see Linz & Chu (2013) for an overview). Hence, general religiosity could be one possible determinant of productivity worth investigating. Kaasa (2016b) showed, however, that general religiosity is positively related to productivity, but this relationship disappeared after adding culture into the analysis. Unfortunately, again no other studies empirically testing the relationships between different religious denominations or general religiosity and productivity could be found.

3. Data and operationalisation

This study analyses the data at the NUTS 1 level. The NUTS - Nomenclature of Territorial Units for Statistics - is a widely used hierarchical classification of regions within countries established by Eurostat (see European Commission. Eurostat, 2012). Countries are divided into regions based on administrative divisions as well as the lower and upper limits for the population size for each level. This classification subdivides each country (NUTS 0 level) into one or more NUTS 1 regions, each of which, in turn, can be subdivided into one or more NUTS 2 regions and so on. Here, the NUTS 1 level was chosen in order to capture possible regional differences as data at the NUTS 2 level were not available for most of indicators used here.

In order to measure the society level labour productivity, an output-input ratio is used here. As the output indicator the GDP is the most available and employed indicator (see, for example, Jankauskas & Šeputienė, 2007; Casey & Christ, 2005; Salinas-Jiménez & Salinas-Jiménez, 2006) and here two indicators were retrieved from Eurostat (2014): the GDP at current market prices in euros, and in order to take purchasing power into account, the GDP at current market prices in the Purchasing Power Standard (PPS) per inhabitant. Regarding the input indicator of labour productivity, both the number of employees and the number of work hours obtained from Eurostat (2014) were used, because simply counting the workers may not take into account possible part-time workers. By combining these different input and output indicators (all for 2008), four different labour productivity indicators were computed (correlations between these four indicators are all over 0.90).

The data about social capital stem from two databases: the European Values Study (EVS) and the European Social Survey (ESS), which among others include various questions allowing to describe social capital. The ESS (ESS 2008) is a biennial multi-country survey covering an increasing number of European countries. The first round was conducted in 2002 and this article uses the fourth wave (year 2008) data, as for this year data from the EVS were available as well. The EVS (EVS 2010) is a multi-country survey that is repeated every nine years and covers also an increasing number of European countries. Here, the fourth wave (year 2008) is used. There are usually 1,000 to 2,000 respondents per country in the case of the EVS and 1,500 to 2,500 respondents per country in the case of the ESS. This offers a good basis for combining these two surveys. Both surveys enable the analysis of the regional level as well. In the regions at the NUTS1 level used in this article, the number of respondents per region was 562.96 on average in the ESS and ranged from 21 to 2,367; in the EVS, the number of respondents per region was 545.74 on average and

ranged from 20 to 1,793. The regional-level indicators corresponding to each question used in this article were obtained by aggregating individual-level data using the weights provided by the ESS and EVS. Although the number of respondents was quite small in some regions because of the complex character of the concept of social capital, surveys are the best option available for measuring social capital.

Regarding the dimensions of social capital, first general trust is described by two indicators (one from the ESS and one from the EVS), while institutional trust is described by five indicators (three from the ESS and two from the EVS). The aim was to include similar questions from both surveys, when available, in order to smooth possible differences in the two surveys. Informal networks were described by two indicators from the ESS and by one from the EVS. In the case of formal networks, only two indicators could be used from the EVS and none from the ESS. Last, civic participation is again described by five indicators (two from the ESS and three from the EVS). All indicators used can be seen in Appendix Table A1. In order to capture the information of initial indicators into corresponding dimensions, similarly to Kaasa (2016a) a confirmatory factor analysis (the principal components method) was performed separately for each dimension of social capital. The factor loadings, percentages of total variance explained by the factor, and the Kaiser-Meyer-Olkin (KMO) measures indicating the appropriateness of the factor model are presented in Appendix Table A1. The shares of total variance explained and the KMO measures can be viewed as acceptable (values of the KMO measure larger than 0.6 or 0.5 are usually considered as acceptable; in the case of only two indicators, the KMO value is always 0.5 because of the formula used for calculating the KMO measure). The factor scores of the new latent variables were saved as variables.

Religiosity is described by eight indicators (four from the ESS and four from the EVS). Similarly to Kaasa (2016b), again confirmatory factor analysis was performed with results shown in Appendix Table A2. The share of total variance explained and KMO measure can be viewed as acceptable. The factor scores were saved as a religiosity variable. Regarding the possible effect of different religious denominations, the Protestantism-Catholicism comparison is often broadened to a more generalised division between hierarchical (Catholicism, Orthodoxy, Islam) and non-hierarchical (Protestantism, Hinduism, Buddhism, etc.) religions (Knack & Keefer, 1997; La Porta et al., 1997). Hence, in order to provide a broader view, in this study the share of those belonging to a hierarchical religion was calculated as an average of respective indicators from both the ESS and EVS in order to smooth possible deviations (the correlation coefficient between the indicators obtained from the ESS and EVS was 0.95).

Cultural dimensions data came from Kaasa, Vadi, & Varblane (2014), who have created new regional-level indicators of cultural dimensions based on Hofstede's (1980) concept using factor analysis and the data from the ESS and EVS for the year 2008 similarly to the factors of social capital dimensions and religiosity created in this study. Every cultural dimension was based on six initial indicators obtained from both the ESS and the EVS (see Kaasa, Vadi, & Varblane, (2014) for details). Although data from Hofstede's (1980, 2001) original study are also available, four decades have passed since Hofstede's study and it can be assumed that cultures may have changed during this time and Hofstede's data are mainly available at the country level only.

The data about institutional quality were drawn from a newly available database offering the European Quality of Government Index (EQGI) (Charron, Dijkstra, & Lapuente, 2014) that is calculated based on the national level indices of governance from the WGI (The World Bank, 2014) correcting them based on survey data reflecting the experiences

and perceptions of citizens at the regional level. The governance index of WGI, also used, for example, by Jankauskas & Šeputienė (2007), is based on six sub-indices: the rule of law, control of corruption, government effectiveness, political stability, regulatory quality, voice and accountability (see Kaufmann, Kraay, & Mastruzzi. (2010) or The World Bank (2014) for further information). The EQGI pertaining to the year 2010 was used as the closest to the year 2008 for which other indicators of the current study were available. As the state of institutional quality does not change rapidly, it can be assumed that the results are not drastically influenced by this lag.

As control variables, an indicator of patent applications to the EPO by priority year (per million of labour force), an indicator of total R&D personnel and researchers (as a percentage of the active population, full time equivalent; an indicator of R&D expenditures per inhabitant was considered as an alternative, but the indicator of R&D personnel was chosen because of a stronger logical connection with labour productivity) and the percentage of the population aged 25-64 with tertiary education attainment were used. All these indicators pertain to the year 2008 and were drawn from Eurostat (2014).

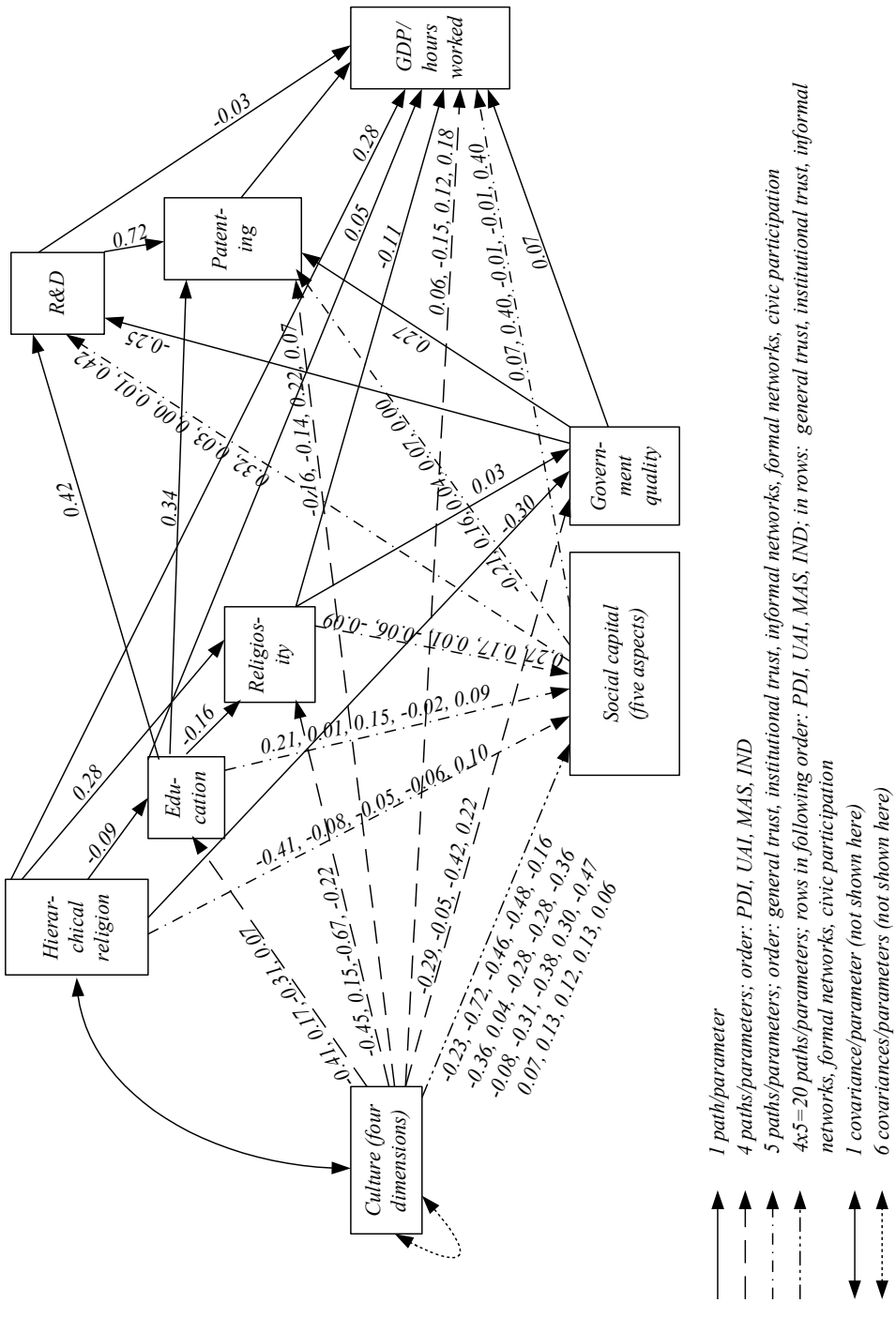
The number of regions covered in this analysis was limited by the countries covered in the EVS and ESS as well as data availability for the regional-level estimates of the European Quality of Government Index. Altogether, 78 regions in 22 European countries (Belgium, Bulgaria, Croatia, the Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Hungary, Latvia, Lithuania, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom) are covered in this analysis. related to productivity, but this relationship disappeared after adding culture into the analysis. Unfortunately, again no other studies empirically testing the relationships between different religious denominations or general religiosity and productivity could be found.

4. Results of the structural model estimation

Next, the SEM approach was used to analyse how different factors influence productivity. First of all, the model includes the direct effects of patenting, R&D and education as control variables, five dimensions of social capital, government quality, four cultural dimensions, religiosity and the share of hierarchical religion. In addition to the direct effects, indirect effects through other factors can often be assumed that consist of the possible causal relationships between the factors of productivity themselves.

First, regarding culture, it can be expected to have an impact on social capital (see Kaasa (2015) for an overview) and at that, different cultural dimensions may have a different impact on different dimensions of social capital (Kaasa, 2015). Culture is also expected to have an effect on government quality: Noorderhaven & Tidjani (2001), for example, found that power distance and masculinity have a negative and individualism a positive effect on government quality. Also, culture can be expected to have some influence on education (Wursten & Jacobs, 2013) as well as religiosity (Trommsdorff, 2012). Similarly, it can be assumed that culture may impact patenting activity (see Kaasa & Vadi (2010) or Kaasa (2017) for an overview). Second, regarding education, it can be argued that a higher level of education means higher social capital: norms as well as cooperation and participation skills can be viewed as by-products of education (see Kaasa (2009), Dee (2004) or Denny (2003) for a more exhaustive overview). Also, education has been found to affect religiosity (Sacerdote & Glaeser, 2001; Zhang, 2012; Arias-Vazquez, 2012), while education has been hypothesised to be influenced by the religious denomination

FIGURE 1. OVERVIEW OF THE ESTIMATED STRUCTURAL EQUATION MODEL (STATISTICAL SIGNIFICANCE CAN BE SEEN IN APPENDIX TABLE A4)



(Mukhopadhyay, 2011). Education can also be expected to affect R&D and patenting (Kaasa, 2009). Third, both religiosity and the share of hierarchical religion can be expected to have an impact on different dimensions of social capital (see Kaasa (2013) and Kaasa (2015) for an overview). Also, religion-related aspects might have an impact on government quality (De Jong, 2011). Fourth, concerning social capital, it is possible that social capital also has an indirect effect on productivity through R&D and patenting (see Kaasa (2009) for an overview). Fifth, similarly, government quality can also be expected to strongly influence R&D and patenting (Tebaldi & Elmslie, 2013; Boudreaux, 2017; Kaasa, Parts, & Kaldaru, 2012). Last, R&D is expected to impact patenting as well.

TABLE 1. STANDARDISED TOTAL, DIRECT AND INDIRECT EFFECTS ACCORDING TO THE STRUCTURAL EQUATION MODEL FOR DIFFERENT PRODUCTIVITY INDICATORS (FACTORS WITH TOTAL EFFECT BIGGER THAN 0.20 ARE IN BOLD)

	GDP (EUR)/hours worked			GDP (EUR)/employees		
	total	direct	indirect	total	direct	indirect
Patenting	0.06	0.06	0.00	-0.09	-0.09	0.00
R&D	0.01	-0.03	0.04	0.05	0.11	-0.06
Education	0.10	0.05	0.05	0.16	0.06	0.11
General trust	0.06	0.07	-0.01	0.04	0.01	0.03
Institutional trust	**0.41**	**0.40**	**0.01**	**0.45**	**0.46**	**-0.01**
Informal networks	-0.01	-0.01	0.00	0.05	0.05	-0.01
Formal networks	-0.01	-0.01	0.00	-0.10	-0.10	-0.01
Civic participation	**0.40**	**0.40**	**0.00**	**0.38**	**0.36**	**0.02**
Government quality	0.09	0.07	0.01	0.06	0.09	-0.04
Religiosity	-0.06	-0.11	0.05	0.00	-0.06	0.06
Hierarchical religion	**0.22**	**0.28**	**-0.06**	**0.17**	**0.21**	**-0.04**
PDI	**-0.35**	**0.06**	**-0.41**	**-0.41**	**0.03**	**-0.43**
UAI	**-0.27**	**-0.15**	**-0.12**	-0.12	-0.09	-0.02
MAS	**-0.28**	**0.12**	**-0.41**	**-0.35**	**0.11**	**-0.45**
IND	**0.30**	**0.18**	**0.12**	**0.25**	**0.16**	**0.09**

	GDP (PPP)/hours worked			GDP (PPP)/employees		
	total	direct	indirect	total	direct	indirect
Patenting	0.11	0.11	0.00	-0.08	-0.08	0.00
R&D	0.00	-0.08	0.08	0.06	0.11	-0.06
Education	0.07	0.02	0.04	0.14	0.01	0.13
General trust	0.14	0.17	-0.02	0.15	0.11	0.04
Institutional trust	**0.43**	**0.41**	**0.02**	**0.51**	**0.52**	**-0.01**
Informal networks	-0.01	-0.02	0.01	0.06	0.06	-0.01
Formal networks	-0.06	-0.07	0.01	-0.19	-0.19	-0.01
Civic participation	**0.44**	**0.44**	**0.00**	**0.41**	**0.38**	**0.02**
Government quality	0.08	0.05	0.03	0.01	0.04	-0.04
Religiosity	-0.02	-0.10	0.08	0.07	-0.04	0.10
Hierarchical religion	**0.33**	**0.41**	**-0.08**	**0.31**	**0.35**	**-0.04**
PDI	**-0.34**	**0.09**	**-0.43**	**-0.40**	**0.07**	**-0.47**
UAI	**-0.20**	**-0.05**	**-0.15**	0.01	0.04	-0.04
MAS	**-0.26**	**0.14**	**-0.40**	**-0.31**	**0.14**	**-0.45**
IND	**0.36**	**0.24**	**0.12**	**0.30**	**0.23**	**0.07**

An overview of the structural equation model estimated is given in Figure 1. The correlation coefficients of all indicators included into the analysis are presented in Appendix Table A2. For structural model estimation the full information maximum

likelihood (FIML) method was used. This method enables utilising all the information available in case of missing data because in case of every observation it takes into account only variables with available data for this observation (Enders & Bandalos, 2001). All the variables were standardised before the analysis to ensure comparability of the relative fit indices calculated by AMOS. The analysis was performed for all four indicators of productivity. The standardised regression coefficients describing the direct effects when GDP (EUR)/hours worked was used as the productivity indicator are presented in Figure 1 and Appendix Table A3. When using other indicators of productivity, only the regression coefficients of productivity were different and they can be seen in Appendix Table A4. The direct, indirect and total effects for all four productivity indicators are summarised in Table 1.

Unfortunately, it was not possible to obtain any indicators about the statistical significance of the indirect and total effects in AMOS. However, according to the results concerning the direct effects, it can be assumed that the border value for significance at the 0.01 level is around 0.20-0.21 and for significance at the 0.05 level around 0.15-0.16.

According to the squared multiple correlations, 70-72% of variance in productivity indicators is explained by the model. The overall model fit has been assessed in terms of five measures. According to the value of the χ^2/df (discrepancy/degrees of freedom) ratio (2.47), the model is acceptable, as commonly the values less than 3 are considered as favourable (Kline, 1998, p. 131). This is also confirmed by the root mean square error approximation (RMSEA) value (0.10), while the borderline for acceptance is 0.1 (Arbuckle & Wothke, 1999). With regard to the relative fit indices, the values of the normed fit index (NFI), incremental fit index (IFI) and comparative fit index (CFI) are 0.95, 0.97 and 0.97, respectively. The values of Bollen's relative fit index (RFI) and Tucker-Lewis index (TLI) (that are according to Hu & Bentler (1995, pp. 89-91) sometimes undervaluing models if the sample size is smaller than 250) are 0.76 and 0.84, respectively. Usually, values higher than 0.9 (Hu & Bentler, 1995, pp. 89-91; Kline, 1998, p. 131), but also those higher than 0.8 (Tsai & Ghoshal, 1998), have been considered as indicators of a good fit. Hence, the model can be viewed as acceptable.

Regarding control variables, none of patenting, R&D or education appeared to have a statistically significant effect on productivity. This is in accordance with the results of Kaasa (2016a) and Kaasa (2016b) indicating that patenting and education appeared to have an effect on productivity only before including social capital or cultural dimensions. Among social capital dimensions, institutional trust and civic participation turned out to have a statistically significant positive direct effect on productivity, confirming the results of Kaasa (2016a). The indirect effects of social capital dimensions are marginal. The positive direct effect of government quality appears to be insignificant and the indirect effect marginal. This is again in accordance with Kaasa (2016a), who found that the effect of government quality is not significant anymore after including social capital into the analysis. Religiosity appears to have no significant direct or indirect effect on productivity. At the same time, hierarchical religion seems to have a statistically significant positive effect on productivity, although the total effect is a little bit smaller because of the small indirect negative effect. This is in accordance with the results of Kaasa (2016b) showing that after including cultural dimensions, religiosity appeared to be statistically insignificant while hierarchical religion appeared to have a negative impact on productivity even after adding cultural dimensions.

The results regarding cultural dimensions are the most interesting. First, power distance appears to have a strong negative effect on productivity and this is in accordance with the results of Kaasa (2016a) and Gorodnichenko & Roland (2010). However, this negative total effect comes from a negative indirect effect through institutional trust while the direct effect of power distance seems to be a rather marginal positive effect. Second, uncertainty avoidance appears to have a negative effect on productivity that is not statistically significant for all productivity indicators. A remarkable part of this total negative effect, if significant, comes from the indirect effect through civic participation. This is in accordance with the results of Kaasa (2016b) where uncertainty avoidance appeared not to be statistically significant for productivity: this might be due to the fact that the regression analysis could capture only the direct effect of uncertainty avoidance. Third, masculinity turned out to have a strong negative effect on productivity confirming the result of Kaasa (2016a), but again, similarly to power distance, this negative total effect comes from a very strong negative indirect effect through institutional trust and civic participation that is balanced by the smaller positive direct effect of masculinity on productivity. Last, the results about individualism indicated a positive total effect of individualism on productivity, again confirming the results of Kaasa (2016b). At that, the total effect consists of a stronger positive direct effect and a much smaller positive indirect effect through various other factors.

5. Discussion

The results of this analysis show that intangible factors are indeed important in determining the productivity of a region. Among the intangible factors analysed in this study, institutional trust and civic participation have the strongest and positive effect on labour productivity and this strong positive total effect consists mainly of the direct effect. Both institutional trust and civic participation reflect the relationship of an individual with the state and institutions. Higher values of those variables mean that people have higher trust for formal institutions and they tend to have more motivation to participate in social processes as they believe that their voice will be heard and considered. Other social capital dimensions, such as general trust, formal or informal networks, did not appear to have a statistically significant impact on productivity although they all are strongly correlated to productivity. Hence, it seems that the main influence mechanism of social capital on productivity is to lower uncertainty and transaction costs, as also noted by Beugelsdijk & van Schaik (2005); Bjørnskov & Méon (2010); Lekovic (2012) and Jankauskas & Šeputienė (2007). A secure and stable environment where people and firms feel protected from possible dishonest practices or abrupt changes seems to be the most important for high productivity.

Although government quality is strongly correlated to productivity, the results of the structural modelling showed no significant effect of government quality on productivity. Hence, it might be the case that the aforementioned institutional trust and civic participation serve as a substitute or supplement for a legal system (Beugelsdijk & van Schaik, 2005; Bjørnskov & Méon, 2010; Lekovic, 2012; Jankauskas & Šeputienė, 2007; Kaasa, 2016a). It is possible that what people think of institutions is more important than the objective expert-assessed state of institutions. Although the indicator of the European Quality of Government Index (Charron, Dijkstra, & Lapuente, 2014) used in this study incorporates also people's perceptions from a survey, the expert-assessed national level indices of governance serve as the basis. The indicator of institutional trust, however,

reflects only people's perceptions. Hence, how people perceive institutional quality and how much trust they have in institutions is very important.

Next, besides institutional trust and civic participation, culture seems to have a strong impact on productivity as well. Power distance and masculinity both appear to have a strong negative effect on productivity, thus confirming the assumption about power distance hindering activities that could improve productivity (van Evergingen & Waarts, 2003; Kaasa, 2015; Papamarcos & Watson, 2006) and supporting the assumption that a more feminine culture makes workers feel more relaxed, which in turn helps them to do their best (Kaasa, 2016b). Individualism proved to be positively related to labour productivity, confirming the assumption that in individualistic cultures people are more achievement-oriented (Papamarcos & Watson, 2006; Gorodnichenko & Roland, 2010), more motivated by the expectations for compensation and recognition (Kaasa & Vadi, 2010; Shane, 1992; Herbig & Dunphy, 1998; Forson, Janrattanagul, & Carsamer, 2013; van Hoorn, 2014), and more prone to contribute to the exchange and diffusion of information (Kaasa & Vadi, 2010; Herbig & Dunphy, 1998; Isaksson, 2007). This is also in accordance with the empirical results of Gorodnichenko & Roland (2010). It is also possible that the role of masculine values, including the orientation towards success and achievement, is to some extent covered by the individualism factor as well and therefore the positive impact of feminine values prevailed in the masculinity dimension. Differently from Kaasa (2016b) here uncertainty avoidance appeared to have a considerable negative effect also on some productivity indicators supporting the assumption of uncertainty avoidance hindering technology improvements by the resistance to everything new and by the reliance on rules. This difference might be explained by the fact that structural modelling enabled to analyse both direct and indirect effects.

In the case of cultural dimensions, the advantage of structural equation modelling can be seen in showing the indirect effects in addition to the direct effects. It turned out that the negative total effect of power distance and masculinity is actually formed by the negative indirect effect through institutional trust and also civic participation in the case of masculinity. The direct effect of power distance and masculinity, although marginal, appeared to be positive. Hence, it may well be that if only analysing the direct effects with the help of simple regression analysis, those indirect negative effects might be missed. In the case of uncertainty avoidance, a considerable part of the negative total effect is formed by the negative indirect effect. This explains why uncertainty avoidance appeared to have no significant effect at all in the regression analysis of Kaasa (2016b).

Regarding the religion-related aspects, general religiosity appeared to have no significant impact on productivity, so the argument of a stronger work ethic and a higher general religiosity promoting productivity did not find any support in this analysis similarly to Kaasa (2016b). It is possible that either cultural dimensions or civic participation and institutional trust capture the sources of labour productivity better than religiosity or values associated with religiosity. The results regarding the share of hierarchical religion showing a significant positive direct effect are in accordance with previous empirical evidence (Islam, 2008; Kaasa, 2016b), but contradict the assumption of Protestantism having a positive influence and hierarchical religions a negative influence. It might be assumed that some important characteristics of regions with a higher share of hierarchical religions may be covered by the cultural dimensions; for instance, it is possible that the negative effect of the more hierarchical society is covered by the power distance dimension (Kaasa, 2016b).

Education, R&D and patenting as control variables did not appear to have a remarkable impact on productivity in this analysis. However, taking into account the strong relationships between all factors included in this analysis, the results of this analysis do not necessarily show that technological development or education are not important at all. The results should be viewed rather as an indication of the relative importance of different factors.

With regard to policy implications, this article enables to shed light on the relative effect of different intangible factors of productivity. As institutional trust and civic participation appeared to be the most important social capital dimensions for labour productivity, focusing on these dimensions seems to be logical. Improving institutional quality is naturally important, but giving people information about those improvements and encouraging participation in the process of developing the improvements may significantly help to foster productivity. Also, it is important to remember that some dimensions of social capital appear to be more important for productivity than others. Hence, analysing dimensions of social capital separately is justified and it would not be appropriate to examine the impact of social capital on productivity using one overall measure of social capital. If only one measure of social capital is used, the conclusion may easily be that there are no possibilities to encourage productivity through social capital, while this conclusion would overlook the role of institutional trust and civic participation. Culture proved to be an important factor as well. Culture of course has been viewed as a quite stable phenomenon that does not change rapidly (Williams & McGuire, 2010) and it cannot be assumed that culture can be changed easily. However, it is possible to use the information about the characteristics of cultures that seem to have a positive influence on productivity to map the possible challenges, and to design policies that try to direct the prevailing values in an advantageous direction. A shift in values started from the government sector may well spread to other life domains, including the business sector. For instance, in more collectivistic cultures it may help when the individual achievements would be valued more, or in masculine societies encouraging more supportive attitudes may prove useful. Also, it can be supposed that when the decision making system would be decentralised, this may promote an understanding that initiative is favoured in a society. However, it has to be kept in mind, of course, that culture is expected to change very slowly.

Regarding the limitations of this study, it should be kept in mind that data sources focussing on Europe were used and European regions were analysed. Therefore, conclusions can be drawn for European regions only. Whether the analysed relationships can apply to the whole world is a topic for future studies when data for a sample larger than Europe become available. Also, data were not available for regions in all European countries in the ESS and EVS, therefore when more complete data become available, it would be interesting to re-run the analysis.

6. Conclusions

This study examined the possible impact of intangible factors such as social capital, government quality, cultural dimensions and religion on labour productivity at the society level. These factors have not received much attention in the previous literature and they have not been included together into the analysis before. As another novelty, regional-level data (78 regions of 22 European countries) were analysed. In order to take into

account the relationships between various factors of productivity, the structural equation modelling approach is used enabling to find out both direct and indirect effects.

The results showed that intangible factors are important in determining the productivity of a region and institutional trust and civic participation have the strongest and positive effect on labour productivity. Although government quality is strongly correlated to productivity, the results of the structural modelling showed no significant effect of government quality on productivity. In the case of cultural dimensions, the advantage of structural equation modelling can be seen in showing the indirect effects in addition to the direct effects. It turned out that the negative total effect of power distance and masculinity is actually formed by the negative indirect effect through institutional trust and also civic participation in the case of masculinity. Individualism proved to be positively related to labour productivity through bot direct and indirect effects. Regarding the religion-related aspects, general religiosity appeared to have no significant impact on productivity, but the share of hierarchical religion turned out to have a significant positive direct effect.

This article enables to shed light on the relative effect of different intangible factors of productivity. Institutional trust and civic participation appeared to be the most important social capital dimensions for labour productivity, so focusing on these dimensions seems to be logical. Improving institutional quality is naturally important, but giving people information about those improvements and encouraging participation in the process of developing the improvements may significantly help to foster productivity. Also, it can be concluded that analysing dimensions of social capital separately is justified and it would not be appropriate to examine the impact of social capital on productivity using one overall measure of social capital As culture proved to be an important factor as well, it might be possible to design policies that try to direct the prevailing values in an advantageous direction, although, it has to be kept in mind that culture is expected to change very slowly.

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Appendix

TABLE A1. RESULTS OF THE CONFIRMATORY FACTOR ANALYSES FOR SOCIAL CAPITAL DIMENSIONS

LATENT VARIABLE	INDICATORS	FACTOR LOADINGS	VARIANCE EXPLAINED (%)	KMO MEASURE OF SAMPLING ADEQUACY
GENERAL TRUST	People can be trusted/can't be too careful , share of "people can be trusted" (EVS)	0.93	86.05	0.50
	Most people can be trusted or you can't be too careful, scale 0-10 (ESS)	0.93		
INSTITUTIONAL TRUST	Trust in the legal system, scale 0-10 (ESS)	0.93	75.27	0.71
	Trust in country's parliament, scale 0-10 (ESS)	0.91		
	Trust in the police, scale 0-10 (ESS)	0.91		
	How much confidence in: the police, scale 1-4 (EVS)	0.85		
	How much confidence in: parliament, scale 1-4 (EVS)	0.74		
INFORMAL NETWORKS	Anyone to discuss intimate and personal matters with, share of those who have (ESS)	0.79	60.48	0.66
	How important in your life: friends and acquaintances, scale 1-4 (EVS)	0.78		
	How often socially meet with friends, relatives or colleagues, scale 1-7 (ESS)	0.76		
FORMAL NETWORKS	Do you work unpaid for: average number of organisations mentioned, max 14 (EVS)	0.97	93.82	0.50
	Do you belong to: average number of organisations mentioned, max 14 (EVS)	0.97		
CIVIC PARTICIPATION	Signing a petition, scale 1-3 (EVS)	0.92	64.80	0.67
	Joining in boycotts, scale 1-3 (EVS)	0.85		
	Signed petition last 12 months, share of those who did (ESS)	0.83		
	Attending lawful demonstrations, scale 1-3 (EVS)	0.81		
	Taken part in lawful public demonstration last 12 months, share of those who did (ESS)	0.57		
RELIGIOSITY	How often pray apart from at religious services, scale 1-7	0.95	85.59	0.90
	How often attend religious services (scale 1-8)	0.95		
	How religious are you, scale 0-10	0.95		
	How often attend religious services apart from special occasions, scale 1-7	0.94		
	Belonging to particular religion or denomination, share of belonging	0.92		
	How important in your life: religion (scale 1-4)	0.91		
	Are you a religious person (scale 1-3)	0.91		
	Do you belong to a religious denomination (share of those belonging)	0.86		

TABLE A2. CORRELATION COEFFICIENTS OF DIFFERENT PRODUCTIVITY VARIABLES AND VARIOUS FACTORS OF PRODUCTIVITY

		1	**2**	**3**	**4**	**5**	**6**
1	GDP (EUR)/hours worked						
2	GDP (EUR)/employees	0.98***					
3	GDP (PPP)/hours worked	0.97***	0.94***				
4	GDP (PPP)/employees	0.92***	0.95***	0.96***			
5	Patenting	0.59***	0.51***	0.53***	0.41***		
6	R&D	0.58***	0.59***	0.50***	0.48***	0.70***	
7	Education	0.49***	0.53***	0.39***	0.42***	0.34***	0.67***
8	General trust	0.53***	0.52***	0.42***	0.36***	0.51***	0.60***
9	Institutional trust	0.74***	0.74***	0.64***	0.60***	0.59***	0.53***
10	Informal networks	0.53***	0.56***	0.45***	0.45***	0.43***	0.49***
11	Formal networks	0.38***	0.30***	0.29***	0.16	0.41***	0.29***
12	Civic participation	0.74***	0.74***	0.64***	0.59***	0.53***	0.63***
13	Government quality	0.67***	0.67***	0.54***	0.49***	0.55***	0.51***
14	Religiosity	-0.44***	-0.44***	-0.33***	-0.28***	-0.30***	-0.40***
15	Hierarchical religion	-0.29***	-0.31***	-0.15	-0.13	-0.30***	-0.32***
16	PDI	-0.71***	-0.70***	-0.60***	-0.54***	-0.64***	-0.59***
17	UAI	-0.63***	-0.57***	-0.49***	-0.38***	-0.60***	-0.61***
18	MAS	-0.59***	-0.61***	-0.48***	-0.45***	-0.36***	-0.48***
19	IND	0.41***	0.40***	0.42***	0.39***	0.38***	0.31***
		7	**8**	**9**	**10**	**11**	**12**
8	General trust	0.55***					
9	Institutional trust	0.51***	0.69***				
10	Informal networks	0.56***	0.59***	0.58***			
11	Formal networks	0.27**	0.56***	0.52***	0.38***		
12	Civic participation	0.53***	0.53***	0.67***	0.62***	0.26***	
13	Government quality	0.55***	0.70***	0.80***	0.71***	0.47***	0.72***
14	Religiosity	-0.47***	-0.36***	-0.37***	-0.46***	-0.18	-0.61***
15	Hierarchical religion	-0.38***	-0.66***	-0.49***	-0.4***	-0.35***	-0.40***
16	PDI	-0.54***	-0.78***	-0.89***	-0.67***	-0.58***	-0.68***
17	UAI	-0.36***	-0.71***	-0.64***	-0.44***	-0.49***	-0.71***
18	MAS	-0.49***	-0.52***	-0.62***	-0.62***	-0.21***	-0.80***
19	IND	0.28***	0.31***	0.40***	0.37***	0.31***	0.22**
		13	**14**	**15**	**16**	**17**	**18**
14	Religiosity	-0.63***					
15	Hierarchical religion	-0.71***	0.55***				
16	PDI	-0.78***	0.34***	0.49***			
17	UAI	-0.65***	0.44***	0.43***	0.72***		
18	MAS	-0.76***	0.73***	0.44***	0.58***	0.62***	
19	IND	0.48***	-0.30***	-0.34***	-0.36***	-0.09	-0.13

Note: *** - significant at the 0.01 level, ** - significant at the 0.05 level, * - significant at the 0.10 level.

TABLE A3. STANDARDISED REGRESSION COEFFICIENTS (<---) AND CORRELATION COEFFICIENTS (<-->) OF THE STRUCTURAL EQUATION MODEL IN THE CASE OF GDP (EUR)/HOURS WORKED AS THE PRODUCTIVITY INDICATOR (FOR OTHER CASES ONLY THE REGRESSION COEFFICIENTS OF PRODUCTIVITY WERE DIFFERENT AND THOSE CAN BE SEEN IN TABLE A5)

VARIABLE		VARIABLE	COEFFICIENT
Education	<---	PDI	**-0.41*** **
Education	<---	UAI	0.17
Education	<---	MAS	**-0.31*** **
Education	<---	IND	0.07
Education	<---	Hierarchical religion	-0.09
Religiosity	<---	Education	**-0.16** **
Religiosity	<---	Hierarchical religion	**0.28*** **
Religiosity	<---	PDI	**-0.45*** **
Religiosity	<---	UAI	0.15
Religiosity	<---	MAS	**0.67*** **
Religiosity	<---	IND	**-0.22*** **
Institutional trust	<---	Education	0.01
General trust	<---	Education	**0.21*** **
Civic participation	<---	Education	0.09
Formal networks	<---	Education	-0.02
Informal networks	<---	Education	**0.15***
Institutional trust	<---	Hierarchical religion	-0.08
General trust	<---	Hierarchical religion	**-0.41*** **
Civic participation	<---	Hierarchical religion	0.10
Formal networks	<---	Hierarchical religion	-0.06
Informal networks	<---	Hierarchical religion	-0.05
Institutional trust	<---	Religiosity	**0.17** **
General trust	<---	Religiosity	**0.27*** **
Civic participation	<---	Religiosity	-0.09
Formal networks	<---	Religiosity	-0.06
Informal networks	<---	Religiosity	0.01
Institutional trust	<---	PDI	**-0.72*** **
General trust	<---	PDI	**-0.23** **
Civic participation	<---	PDI	-0.16
Formal networks	<---	PDI	**-0.48*** **
Informal networks	<---	PDI	**-0.46*** **
Government quality	<---	PDI	**-0.29*** **
Institutional trust	<---	UAI	0.04
General trust	<---	UAI	**-0.36*** **
Civic participation	<---	UAI	**-0.28*** **
Formal networks	<---	UAI	**-0.28*** **
Government quality	<---	UAI	-0.05
Informal networks	<---	UAI	**0.21** **
Institutional trust	<---	MAS	**-0.31*** **
General trust	<---	MAS	-0.08
Civic participation	<---	MAS	**-0.47*** **
Formal networks	<---	MAS	**0.30*** **
Informal networks	<---	MAS	**-0.38*** **
Government quality	<---	MAS	**-0.42*** **
Institutional trust	<---	IND	**0.13** **
General trust	<---	IND	0.07
Civic participation	<---	IND	0.06
Formal networks	<---	IND	0.13
Informal networks	<---	IND	0.12

TABLE A3. STANDARDISED REGRESSION COEFFICIENTS (<---) AND CORRELATION COEFFICIENTS (<-->) OF THE STRUCTURAL EQUATION MODEL IN THE CASE OF GDP (EUR)/HOURS WORKED AS THE PRODUCTIVITY INDICATOR (FOR OTHER CASES ONLY THE REGRESSION COEFFICIENTS OF PRODUCTIVITY WERE DIFFERENT AND THOSE CAN BE SEEN IN TABLE A5)

VARIABLE		VARIABLE	COEFFICIENT
Government quality	<---	IND	**0.22*** **
Government quality	<---	Religiosity	0.03
Government quality	<---	Hierarchical religion	**-0.30*** **
R&D	<---	Education	**0.42*** **
R&D	<---	Government quality	**-0.25*** **
R&D	<---	Institutional trust	0.03
R&D	<---	General trust	**0.32*** **
R&D	<---	Civic participation	**0.42*** **
R&D	<---	Formal networks	0.01
R&D	<---	Informal networks	0.00
Patenting	<---	R&D	**0.72*** **
Patenting	<---	Education	**-0.34*** **
Patenting	<---	PDI	-0.16
Patenting	<---	UAI	-0.14
Patenting	<---	MAS	0.22
Patenting	<---	IND	0.07
Patenting	<---	Government quality	0.27
Patenting	<---	Institutional trust	0.16
Patenting	<---	General trust	**-0.21** **
Patenting	<---	Civic participation	0.00
Patenting	<---	Formal networks	0.07
Patenting	<---	Informal networks	0.04
GDP (EUR)/hours worked	<---	Education	0.05
GDP (EUR)/hours worked	<---	Hierarchical religion	**0.28*** **
GDP (EUR)/hours worked	<---	Religiosity	-0.11
GDP (EUR)/hours worked	<---	PDI	0.06
GDP (EUR)/hours worked	<---	UAI	-0.15
GDP (EUR)/hours worked	<---	MAS	0.12
GDP (EUR)/hours worked	<---	IND	**0.18** **
GDP (EUR)/hours worked	<---	Government quality	0.07
GDP (EUR)/hours worked	<---	Institutional trust	**0.40** **
GDP (EUR)/hours worked	<---	General trust	0.07
GDP (EUR)/hours worked	<---	Civic participation	**0.40*** **
GDP (EUR)/hours worked	<---	Formal networks	-0.01
GDP (EUR)/hours worked	<---	Informal networks	-0.01
GDP (EUR)/hours worked	<---	Patenting	0.06
GDP (EUR)/hours worked	<---	R&D	-0.03
PDI	<-->	UAI	**0.72*** **
UAI	<-->	MAS	**0.62*** **
MAS	<-->	IND	-0.13
PDI	<-->	MAS	**0.58*** **
PDI	<-->	IND	**-0.36*** **
UAI	<-->	IND	-0.09
Hierarchical religion	<-->	PDI	**0.49*** **
Hierarchical religion	<-->	UAI	**0.43*** **
Hierarchical religion	<-->	MAS	**0.44*** **
Hierarchical religion	<-->	IND	**-0.34*** **

Note: *** - significant at the 0.01 level, ** - significant at the 0.05 level, * - significant at the 0.10 level.

TABLE A4. REGRESSION COEFFICIENTS FOR DIFFERENT PRODUCTIVITY INDICATORS

	GDP (EUR)/ HOURS WORKED	GDP (EUR)/ EMPLOYEES	GDP (PPP)/ HOURS WORKED	GDP (PPP)/ EMPLOYEES
Patenting	0.06	-0.09	0.11	-0.08
R&D	-0.03	0.11	-0.08	0.11
Education	0.05	0.06	0.02	0.01
General trust	0.07	0.01	0.17	0.11
Institutional trust	0.40**	0.46**	0.41*	0.52**
Informal networks	-0.01	0.05	-0.02	0.06
Formal networks	-0.01	-0.1	-0.07	-0.19*
Civic participation	0.40***	0.36**	0.44**	0.38**
Government quality	0.07	0.09	0.05	0.04
Religiosity	-0.11	-0.06	-0.10	-0.04
Hierarchical religion	0.28**	0.21*	0.41***	0.35**
PDI	0.06	0.03	0.09	0.07
UAI	-0.15	-0.09	-0.05	0.04
MAS	0.12	0.11	0.14	0.14
IND	0.18*	0.16*	0.24**	0.23*
R squared	0.72	0.7	0.61	0.56
F-statistic	11.03***	10.08***	6.68***	5.47***

Note: *** - significant at the 0.01 level, ** - significant at the 0.05 level, * - significant at the 0.10 level.