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# Social Capital and Long-Term Regional Development within Poland in the Light of Experimental Economics and Data from a Questionnaire

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**Abstract:** For some time, researchers have been interested in determinants of long-term growth which are not purely economic in nature. The development of the concept of social capital by sociologists, politologists and economists is a visible effect of this interest. Any determinant of long-term growth is obviously important from the point of view of sustainability, particularly when its relation to other factors of sustainability, such as environmental protection, is taken into account. This article presents the results of research into spatial variation in social capital within Poland (according to region and size of home town). The authors consider social capital in relation to trust, trustworthiness and, in particular, cooperation, as well as taking into account attitudes regarding legal norms (law-abidingness). Such a wide approach enables us to eliminate the negative aspects of trust and concentrate on its positive forms, which can result in an economic rent. The aim of the article is to identify regions of Poland that are characterized by a high level of social capital from the point of view of individuals exhibiting a willingness to cooperate with others and observe the law and relate these results with the perspectives for long-term growth in Poland. The results of the research are based on a study carried out on a sample of 1540 students using experimental game theory alongside a questionnaire that investigated various aspects of cooperation, trust, trustworthiness and aversion to inequality. The results of the study indicate intuitively reasonable associations between the data from the questionnaire and behaviour in the experimental games suggesting that the declarations are (in statistical terms) meaningful. Analysis indicates that, in Poland, readiness to cooperate tends to be higher in rural areas. Although the study concentrates on the relation between social capital and economic development, it is also argued that high levels of social capital also favour other components of sustainable development.

**Keywords:** cooperation; social capital; law abidingness; game theory; experimental economics; regional development; Poland

## 1. Introduction

Recent decades have brought a huge increase in research on factors of long-term economic growth which are not purely economic. The development of the concept of social capital is a visible effect of this interest. This concept is important from the point of view of sustainable development, which takes a wider view of long-term economic development by considering, for example, social cohesion and environmental protection. The concept of social capital is an interesting platform for interdisciplinary discussion and in the case of economics means a return to the consideration of values, norms and

ethics in order to understand human nature, coordination and cooperation. Hence, it could be argued that the development of social capital is an integral part of sustainable development. However, there remain serious limitations in the theory, as well as conceptual and methodological differences, which create major problems in analysing the nature and role of social capital. The concept itself is defined in various ways, investigated from different perspectives and measured in a variety of ways, which leads to ambiguous conclusions. Nevertheless, social capital is seen as being a factor of economic development and even as the “missing link” [1]. Social capital based on trust and cooperation may act as a source of the competitive advantage a region or a country. The importance of social capital to regional and national development has been underlined by the World Bank since the middle of the 1990s. C. Grootaert, a participant in the World Bank’s Social Capital Initiative [2], called social capital the missing link, since the classical factors of growth explain only a fraction of the process of growth and development, because they overlook the way in which economic actors interact and organize themselves to generate growth and development. M. Woolcock [3] interprets social capital as being more than just a factor of development, since it can act as a platform promoting discussion by creating a common language and ground for politicians, historians, anthropologists, economists and sociologists. Many studies have confirmed the links between social capital and economic factors [4–9]. However, it is important to note that social capital has long-term effects. E. Ostrom [10] notes that regional and national government play an important role in creating the form and level of social capital, which has an effect on long-term economic success. Regional and national government can promote or hinder the process of creating social capital and, in this way, have a real influence on building the competitive advantage of a region. The competitive advantage of a region is strongly linked to the competitive advantage of an enterprise located in that region, which will be more fully described in Section 2.

A low level of social capital can act as a barrier to the economic development of regions and countries, since it may discourage investors from locating enterprises there. The microeconomic dimension of benefits intersects with the macroeconomic dimension: one may even talk about positive feedback. On the other hand, locating in an unfavourable environment with a low level of social capital leads to barriers to the efficient functioning of firms. In this case, one may talk about a vicious circle which makes economic development impossible. Regions with a low level of social capital may well prove to be poor locations to invest in, which in turn leads to slower development or even stagnation, leading to a further decrease in social capital. Hence, it can be argued that a high level of social capital in a region is strongly related to sustainability. Choosing an appropriate region to locate in is a strategic investment for a firm, which should also take into account the resources and social environment. In addition, attracting firms that build their strength on trust and cooperation increases the competitive advantage of a region.

The Brundtland report [11], submitted to the United Nations (UN) General Assembly in 1987, defines sustainable development as “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.” As R. Emas [12] states, this definition is vague but is understood to cover a number of dimensions. According to the UN, the elements of sustainable development include: economic growth, social cohesion, environmental protection, health, well-being and security. Based on this, social capital can be considered as an element of sustainable development, or alternatively as a factor of sustainable development, since it is a factor of long-term economic growth. In addition, as K. Sønderskov [13], Macias and Williams [14] and Cho and Kang [15] show, social capital (particularly at the level of the local community) is positively associated with pro-environmental behaviour. This article concentrates on the economic effect of social capital. The precise nature of these effects is unclear, since various aspects of social capital may be taken into account and feedback occurs. A high level of economic growth may lead to an increase in the level of social capital. On the other hand, in times of recession, which are accompanied by an increase in unemployment, one can often observe what is described by Banfield as “amoral familism” [16]. This is a reaction to the deteriorating material situation and poverty, particularly in cases where state

and market institutions are underdeveloped. Economic growth may counteract this phenomenon and develop positive forms of social capital, as indicated by the studies of Sabatini [17]. Economic development can be seen as having a positive effect on social capital, since research indicates that civil liberty is strongly associated with income per capita and, as Bilson argues [18], economic development determines civil liberties and not vice versa. A higher level of GDP per capita generally ensures that the material needs of a society are satisfied. Such societies can thus concentrate more on satisfying other, non-material, needs, such as group membership or a trusting and tolerant social environment. However, economic growth can also lead to the destruction of social capital when individuals devote their energy to work and consumption. This ensures economic growth but at the cost of devoting less time to taking part in organisations, social contacts and so forth. This problem was highlighted by R. Putnam [19] who indicated that one of the major factors in the decreasing level of social capital in the United States was the increasing participation of women in the labour market. The research of Costa and Kahn [20] showed a significant negative correlation of the level of participation in the labour market with organisation membership and maintaining social ties. A higher level of economic development is generally associated with greater fluctuations in the nature of the labour force, which increases social heterogeneity and thus affects social capital. This effect may be positive but rapid fluctuations in the labour force can damage social cohesion, both within and outside of the work place. A high level of mobility reduces individuals' feelings of security and stabilisation. The effect of social capital is modulated by legal, technical and spatial factors. However, a number of studies [4–8,21–24] have shown that a high level of social capital has a positive effect on economic growth and the nature of such growth (Priority no. 8 of the UN policy on sustainable development).

There also exists an association between social capital and other aspects of sustainable development. Social capital is associated with health [25–27], well-being [28–31], inequality [32–36], sense of security [37–39] and environmental protection [40–42].

The study carried out by Y. Algan and P. Cahuc [24] on the descendants of emigrants to the United States is particularly important in this context. Their study design enables the unravelling of the interaction between geographical location and the transmission of social capital through the generations. They note that the level of social capital (in particular, the level of generalized trust) in Scandinavian countries clearly rose throughout the 20th century compared to the countries of Western Europe and even more so in relation to the countries of Eastern Europe. This is associated with the fact that the Scandinavian societies were not so affected by the trauma of war or communism (see also A. Alesina and N. Fuchs-Schündlin [43]). This high level of social capital is naturally linked to the successful formation of successful social market economies (a form of virtuous circle).

There exist many concepts and definitions of social capital (this will be discussed in more detail in Section 2). Since these ideas bridge the gap between microeconomics and macroeconomics, this article uses a normative approach to social capital by looking at the economic benefits for enterprises and regions resulting from positive forms of cooperation. The positivistic approach, which does not place any intrinsic value on the social networks of individuals and their nature, is an alternative approach [44]. However, using a positivistic approach, it is much more difficult to show how social capital—in the form of social networks— aids the development of enterprises and regions. This article will concentrate on cooperation, whose component elements include trust, trustworthiness and aversion to inequality. These aspects will be investigated with the aid of experimental game theory. In addition, the authors consider law-abidingness, since cooperation in accordance with the law is a positive form of social capital which favours economic development. Enterprises which function in regions where individuals see cooperation in line with the law as being the best approach to achieving success and intending to follow such a strategy may obtain benefits in the form of an extraordinary rent. This article underlines this possibility (obviously the forms of legal and social norms and how they interact present a very broad subject for study, too wide to be presented within one article, see for example, [45–47]). One should also note that, in certain cases, acting on the boundaries of the law might be more appropriate socially and economically than abiding by the law. However, this article does not consider

such a possibility). The authors argue that concentrating purely on generalized trust—which is often the case in studies on social capital—is insufficient. Naturally, trust is an integral part of cooperation but this does not suffice in bringing positive effects at the level of a society as a whole. Moreover, some researchers indicate that cooperation is possible even when trust is non-existent [48], due to a wide variety of social tools, such as norms or institutions. Legal norms, informal means of social control, moral codes, religion and/or social norms of cooperation and responsibility are also factors leading to cooperation [49].

It should be noted that not every form of trust is positive for an organization and society as a whole. In particular cases, it can be socially destructive, for example, when trust is only expressed to members of “one’s own group,” that is, intragroup trust, which is a form of bonding capital. Such capital can, in extreme cases, have negative effects on society as a whole, while being positive for the group itself. Hence, by analysing social capital, defined as the ability to cooperate for the common good, we eliminate the negative aspects of trust. Social capital is based on social norms and institutions, customs and networks of formal and informal relationships. Trust is a necessary component for cooperation to arise but it is not sufficient. It should also be noted that a low level of trust might result from a low level of wealth in a society [50]. According to Sztompka “various forms of trust and distrust [ . . . ] form a complicated balance of functionality and dysfunctionality, both for society as a whole and its individual members” [51]. Not every expression of trust is positive and distrust may play a positive role, for example, rational distrust towards those who are not trustworthy. Cooperation requires not only trust but also trustworthiness and the desire to keep one’s reputation. Kochanowicz [52] notes that trust is only one of the components of cooperation. The social skills required to work and function in a given social organization are an example of another such component.

The goal of this article is to indicate spatial variation in the level of social capital, understood in this way, in Poland as represented by Polish students, taking into account the regions they come from and the size of their home town. The study group is not representative of the population as a whole with regard to age, social status or education. It is a relatively uniform group and thus it is difficult to infer the behaviour of the entire population on the basis of the behaviour of the study group. However, studies of the evolution of systems of norms, values and beliefs [24,53–55] indicate that our study group represents the social capital of the societies in which they were raised. Hence, conclusions regarding the social capital of the regions in which the students were raised are justifiable. The basis for inference is formed by the authors’ study of a sample of 1540 students. The originality of this research lies in the fact that declarations regarding cooperation and attitudes towards observing the law (which are seen as positive components of social capital) are observed alongside the behaviour of the same individuals in experimental games designed to illustrate trust, trustworthiness, cooperation and aversion to unfairness. This enables an assessment of the reliability of the declarations from the questionnaire, which due to for example, the intention-behaviour gap (see, e.g., F. Kaiser et al. [56]), can be unreliable. The questionnaire was used alongside the following experimental games: trust, public good and ultimatum.

The second section of this article presents the concept of social capital and the current theory regarding regional development, including specific factors of a social nature. The authors consider the significance of the way in which a region is organized to firms wishing to locate in that region to gain a competitive advantage.

In the third section the methods applied and sample are described. The fourth section presents results from the authors’ study on social capital in Poland by a presentation of the results from the questionnaire and analysis of the associations between these declarations and behaviour in the experimental games. A summary is given in the fifth section.

## 2. Social Capital, Regional Development and Their Interaction

There is no universally accepted definition or interpretation of social capital. Social capital is considered from various theoretical perspectives (neo-Durkheimist, economic, historical-institutional),

analysed at different levels (individuals, groups, the macro level) from various aspects (structural, i.e., analysis of networks of relations, normative, i.e., analysis of norms and values and behaviourist, i.e., analysis of observed behaviour). Social capital can be defined using a positive approach (avoiding any normative appraisal) or a normative approach (subjectively, appraising values). It can be treated as an individual good, a common good or a public good.

In many definitions of social capital, trust is described as a component. J. Coleman defines social capital as “the traits characteristic of social life—networks, norms and trust—which promote cooperation and the coordination of individuals’ efforts towards a common good” [57]. According to R. Putnam, social capital “refers to (...) such societal traits as trust, norms and relational bonds, which can increase the effectiveness of a society and promote coordinated action” [58]. P. Sztopka defines it as: “bonds of trust, loyalty and solidarity expressed in communal action and autonomy” [51]. The level of generalized trust is the most commonly used measure of such capital and in many cases the only measure that has been applied [5,8,59].

Other authors underline the meaning of networks of relations. N. Lin interprets social capital as networks and the resources associated with them: “the resources contained in social relations” [60]. Grootaert and van Bastelaer interpret social capital in a similar way: “a network of institutions, relations and values which regulate interactions between people and lead to socio-economic development” [61]. Other authors stress the fundamental role of norms and values, for example, Knack: “common values and norms, informal networks and participation in organizations which influence an individual’s ability to take part in group actions with the goal of achieving a common aim” [62], Grootaert: “the norms and social relations embedded in the social structure which enable individuals to cooperate with the goal of achieving defined aims” [2], or Ostrom “norms and regulations, the division of power, understanding and expectations regarding the norms of individual and group behaviour and even family structure” [10].

Our analysis concentrates on the interaction of two aspects: cooperation and law-abidingness. Considering just the first of these aspects means concentrating not on the sources or nature of social capital themselves but only on its visible effects (a functional approach). Many concepts of social capital indicate that the function of social capital is to enable cooperation between individuals in order to achieve goals that could not be attained without cooperation. Human capital determines the wealth of individuals, not of societies, particularly in highly developed countries. However, the sum of the qualities of individuals does not guarantee a team victory in international competition. It is undeniable that human capital is significant in the macroeconomic dimension, but its benefits in the form of international competitiveness are observed only when highly educated workers can cooperate with each other. This is more than a simple sum of the competencies of individuals [63].

By accepting law-abidingness (acting in accordance with the law) as an aspect to be analysed, the authors assume that this trait is subject to norms which are significant to social capital from an economic point of view, although legal norms (and, especially, abiding by these laws) are not always included in concepts of social capital. Only a few concepts of social capital underline the meaning of formal institutions. The majority of the concepts of social capital ascribe a greater role to unwritten and informal norms, thus assuming that social capital is complementary or substitutional with respect to formal institutions. However, some researchers (e.g., Ostrom [10]) see formal institutions as a component of social capital. Collier even proposes categorizing social capital into governmental and civil [64]. Knack [62] defines the first on the basis of government institutions (including legal norms), which influence the ability of individuals to cooperate in order to achieve a common goal. On the other hand, civil social capital covers commonly held values, norms and social networks, which influence the ability of individuals to cooperate in order to achieve a common goal.

C. Grootaert notes that despite the diversity of opinions as to what social capital is precisely, there exists common ground. Those researching social capital [2], as given in: [65]:

- link the economic, social and political spheres;
- appreciate the potential created by social networks for the promotion of development and the danger of the appearance of negative effects—whether development or negative effects prevail depends on the nature of such networks and the wider context;
- concentrate attention on the relation between economic actors and on how their organization can improve the effectiveness of business;
- assume that favourable institutions and social networks have positive external effects.

Functioning in a favourable environment brings a number of direct and indirect benefits for firms. J. Czapiński takes a wide view of this: “[social capital] makes negotiating easier, lowers transaction costs, shortens the process of investment (lowers the probability of the decisions of the administrative powers being legally challenged), lowers corruption, increases the transparency of parties to an agreement, promotes long-term investment and the diffusion of knowledge, prevents the overuse of commonly held goods and increases the cohesion of social groups. In addition, via the development of a civic society, it supports social control of the decisions made by administrative powers” [66]. A high level of trust leads to a positive climate for developing partnerships, decentralizing decisions and control, together with the free flow of information. Trust reduces transaction and control costs, promotes the independence, activeness and elasticity of employees, as well as the development of unconventional solutions [67]. Not only does social capital decrease transaction costs but it can also lead to increasing the number of transactions. K. Arrow notes that, in general, all transactions rely on trust and a low level of trust decreases the number of transactions that are beneficial for both sides [68].

Social capital enables the free flow of information, which reduces the transaction costs involved in the functioning of firms and economies, control costs and lowers the level of risk. Extensive networks of contacts can reduce the costs of searching for work or credit and improve the flow of information regarding innovations, unreliable clients and confidence tricksters, while reducing the range in which moral hazard exists. A high level of trust creates a favourable environment for entrepreneurship (which has been shown by an empirical study [69] based on 60 countries).

A high level of social capital in a country, region or city can be—in certain circumstances—a source of competitive advantage for a firm locating in a particular area. In particular, when social capital is characterized by a high level of trust and trustworthiness, as well as the observance of legal, social and moral norms. An advantage can be obtained when high levels of cooperation are twinned with competition on the basis of fair play. There does, of course, exist a natural tension between cooperation and competition, which can be modelled using game theory, considered in the next section.

The character of a given society is as important as the character of its individuals. More and more often, researchers use the concept of social capital to explain why certain societies are more efficient than would be indicated by the material resources that they possess. This indicates that various factors from the fields of culture, psychology and/or social relations play such a role that the whole is greater than the sum of the parts [70]. The concept of social capital enables us to describe how other factors of economic growth (e.g., human, physical and financial capital) are organized and how they influence each other, since the way in which processes are organized is a determinant of their success. Social capital is used to combine and utilize other forms of capital at various levels of effectiveness [71]. Simultaneously, social capital is a lasting trait of a region and is, in practice, immobile. Creating high levels of social capital lasts a long time but it can be destroyed in a short period.

When considering the sources of development and competitiveness, A. Jewtuchowicz [72] noted that lasting differences in the level of development of regions can only arise as the result of specific resources, which cannot exist independently of the conditions under which they developed. Generic resources that have a universal character do not result in a lasting difference between territories independently of the activity of economic and social actors. This is due to the fact such resources are not unique and can be found in various locations. Hence, differences in the level of regional development may result from various levels of social (relational) capital. Social capital promotes the

emergence of cooperation and combinations of various strategies realized at the level of a territory, as well as the formation of economic players into a network.

Social capital is a resource that is created by a given community as a whole. Regional development is one of the clearest platforms for the appearance of various forms and aspects of social capital. A region—from a sociological point of view—means a community of individuals and the culture associated with it, which to a large degree determines the level of social capital. Since social factors have a significant meaning for generating differences between regions, the creation and utilization of social capital is an important mechanism for stimulating local and regional development [73].

Taking into account the nature of social capital and current determinants of regional development, it seems reasonable to state that gaining a rent from social capital is a factor in a firm gaining a competitive advantage (such a concept was proposed in: [74]). Currently, the concept of economic rents is also—next to traditional factors of production giving an economic rent—applied to rare and specific forms of factors of production. J. Barney lists the common traits of resources that bring an income. They are rare, valuable, difficult to copy, cannot be replaced (i.e., there is no substitute) [75] as given in: [76]. Social capital undoubtedly fulfils all of these conditions. Similarly to a geographic rent, it promotes the socio-economic development of a region and is a bonus resulting from its geographical location in a specified geo-political system [76]. The rent from social capital is also a bonus for functioning in a particular social, cultural and institutional environment.

Another approach was proposed by H. George (and developed later by various authors). According to this approach, social capital can be treated as a factor resulting from geographical position, which generates an income in the form of the rental price of land. H. George understood land as a factor of production in a much wider context than D. Ricardo and K. Marx, that is, as any resource that is neither financial capital, nor labour. Hence, this definition just states what land rent is not and thus its interpretation covers a much wider range of resources than and even almost removed from, the land itself. The initial definition of land rent covered in particular: raw materials, the forces of nature and the opportunities presented by nature. Currently, this list includes: radio waves, communications infrastructure, access to the Internet, political stability, national culture and heritage and so forth, in so much as they are connected with the land given in: [77]. Since social capital is non-mobile, it can also be added to this list.

### 3. Material and Methods

Assessment of the level of social capital in the Polish regions was carried out on the basis of three experimental games combined with a questionnaire (The description of the study procedure would be quite extensive for a publication of typical length. For a complete description of the study and the sample, see [78,79]).

The study was based on a sample of 1540 students of public universities located in capitals of the 16 Polish regions between April and June in 2014 (see Figure 1). The sizes of the subsamples from each of the universities were in the range 88–100. The participants filled in a questionnaire and played three experimental games designed to illustrate various aspects of social capital: the *trust* game, the *public good* game, as well as the *ultimatum* game.



Figure 1. Map of the regions of Poland.

In the public good game [80], the participants decide how much from a set fund they should assign to a common pool. Each participant makes his/her decision independently of the other players. The total amount assigned to the pool is multiplied by a factor greater than 1 but less than the number of players. The contents of the pool are then shared out between all the players, including those who did not pay anything into the pool. The sum of the payoffs is maximized when all of the players pay all of the funds available to them into the pool. This is a solution that is optimal in the Pareto sense (i.e., if at any other solution one player obtains a greater payoff, then at least one of the players must obtain a smaller payoff) and additionally satisfies the condition that each player obtains the same payoff. Hence, this solution can be interpreted as the socially optimal solution.

However, when a player acts optimally from his/her point of view, then he/she should not pay anything into the pool regardless of what the other players do (in the language of game theory, not paying anything into the pool dominates all other actions [81]). By definition, at a Nash equilibrium, all of the players carry out their optimal actions given the actions of the remaining players (i.e., none of the players have an incentive to unilaterally change their decision). Hence, it follows that at the unique Nash equilibrium, none of the players pay anything into the pool. This can be interpreted as the strategy that is optimal from an individual's point of view. However, it is easy to check that at the socially optimal solution, each of the players obtains a greater payoff than at the Nash equilibrium.

On the other hand, behaviour corresponding to the Nash equilibrium is very rarely observed in the *public good* game [82], even though players have no personal incentive to pay anything into the pool (the assumption of *homo oeconomicus* is not satisfied). Those who do not pay anything into the pool may be described as *free-riders*, while playing a large amount into the pool is a sign of pro-social behaviour. In this game, the participants face a choice between costly action for the common good and free-riding. Of course, action for the common good can bring individual benefits, particularly if the other participants also act for the common good. However, it is possible that the costs of such pro-social action might outweigh the benefits resulting from the behaviour of the other players. On the other hand, a free-rider can gain benefits from the pro-social behaviour of the other participants.

This game illustrates an aspect of generalized trust, that is, expectations as to whether the other players will show pro-social behaviour. Without such trust, players would not pay anything into the common pool. Hence, those paying large amounts into the pool are called *co-operators*, while those who do not are called *defectors* or *free-riders*. In our study procedure, the *public good* game involved



four players, who each received 20 PLN (approximately 5 Euro) and were anonymous to each other. The amount paid into the pool was multiplied by 1.6.

The *trust game* (also known as the *investment game*) was proposed in Berg, Dickhaut & McCabe [83]. There are two (commonly anonymous) players denoted A and B. Player A is given a fixed amount of money,  $X$  and can transfer some or all of this money to Player B. The amount transferred, denoted  $Y$ , is multiplied by a factor of  $\lambda$ , which is greater than 1 and commonly equal to 2 or 3. The rules of this transfer are known to both sides. Following this, Player B can return a portion of the money that he/she received,  $\lambda Y$ . The *trust game* illustrates trust via the amount transferred by Player A and trustworthiness via the amount returned by Player B relative to the amount he/she obtained.

According to the assumption of economic rationality, Player B should not return any money, since this would simply reduce his/her payoff. Taking this into account, Player A should not transfer any money to Player B. Hence, at the unique Nash equilibrium of this game, Player A does not transfer any money. However, in practice players do not behave according to the assumptions of economic rationality. One explanation for this lies in the fact that Player A might expect different behaviour from Player B than that resulting from the assumption of economic rationality, that is, on the basis of trust that Player B will exhibit positive reciprocation by returning some of the money that he/she obtained. Player A might also be motivated by aversion to inequality, which can lead to Player A transferring a small amount of money, even when he/she has no trust that Player B will reciprocate. Similarly, Player B might return a portion of the money that he/she obtained. This may well result from a norm of reciprocity. In this way, Player B shows that he/she is worthy of the trust showed by Player A.

Although this game is clearly an abstraction, it illustrates the fact that cooperation between players is commonly needed to initiate an enterprise, for example, between an investor and an entrepreneur. Obviously, market economies are characterized by competition between firms but economic development would be impossible without trust in the monetary system and trading partners. As Arrow states [68] “[V]irtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence.” P. Sapienza et al. [54] also consider the relation between culture, including trust and economic outcomes.

In our study, Player A was given 10PLN and the amount transferred to Player B was multiplied by a factor of 3. Players were assigned these roles at random and did not know who they were playing with.

The *ultimatum game* [84] also involves two players (labelled A and B) who have a given amount of money to split between each other. Player A anonymously proposes to Player B in what way the money should be split (e.g., 50-50, 90-10, 100-0). Player B can either agree or disagree to this split. If he/she agrees, then the money is split according to the proposition. If Player B does not agree, then neither player receives anything. No negotiation or repetition of the game is possible. Under the assumptions of economic rationality, Player B should accept any positive amount, since receiving something is better than receiving nothing. If Player A is rational and knows that Player B is rational, then Player A should offer Player B the smallest positive amount possible. In our study, 20PLN was to be split between the players and each player had to obtain a unit number of zloty. Hence, Player A should offer Player B 1PLN (in other words, demand 19PLN). However, in practice this is observed very rarely. Most often, Player A offers significantly more than the minimum positive amount.

The *ultimatum game* illustrates players’ aversion to unfairness, which in this case may be seen in the form of an uneven split, since the roles of the players are chosen at random. Many respondents reject low offers due to a feeling of injustice, which from a sociological point of view can be argued to be rational. In this way, Player B punishes selfish or unjust behaviour at some cost to him/herself. The decision of Player A is also motivated by a feeling of justice, both his/her internalized aversion to being unjust, as well as realizing that he/she might be punished for being unjust. High offers from Player A may also be motivated by altruism. Hence, offers of even splits are indicators that Player A is averse to inequality, altruistic, or at least observes social norms of fairness. In our study, the amount to

be split was 20PLN, the roles were chosen at random and the players were anonymous to each other. The offer to Player B had to be a multiple of 1PLN.

After playing the games, the participants of the study filled in a questionnaire regarding their behaviour and views related to aspects of social capital. Some of the questions were related to trust, cooperation and engagement in organizations and one's social network. This article concentrates, above all, on the answers given to the two following questions regarding the respondent's general strategy of action:

- In your opinion, which of the following types of strategy is most likely to bring success:
  - Above all, individual effort and the minimum amount of cooperation, in line with the law.
  - Above all, individual effort and the minimum amount of cooperation, on the borders of legality or even beyond them.
  - Cooperation with others in line with the law.
  - Cooperation with others on the borders of legality or even beyond them.
- Do you intend to act in accordance with the type of strategy chosen above?

The second question above was answered on a five-point scale (1) Yes, (2) Probably, (3) Difficult to say, (4) Probably not, (5) No.

The participants were volunteers responding to announcements of the study. The only criterion for acceptance was being a student of the university at which a particular session was held, independently of which region the student came from. Full-time and part-time students at any level or course of study (undergraduate, masters, doctoral) could register. The authors aimed to obtain students from a wide range of courses in each city. Hence, the sessions were not carried out in universities with a specialist profile (e.g., medical, economics or technical universities). Table 1 describes the structure of the study group based on where the study was conducted, which regions the students originally came from and the size of their hometown. It should be noted that the regions in the south-east (Lubelskie, Małopolskie, Podkarpackie and Świętokrzyskie) are the most rural. The south-western regions and Warmino-Mazurskie also exhibit a low level of urbanization, particularly Lubuskie and Opolskie. All of these regions were part of Germany until World War II. The most urban regions are located in central Poland in relation to the east-west axis (Kujawsko-Pomorskie, Łódzkie, Mazowieckie—which contains Warsaw, Śląskie—which includes the large conurbation centred around Katowice), as well as Zachodniopomorskie (in the north-west). In economic terms, GDP per capita is by far the highest in the Mazowieckie region, followed by three regions which were historically associated with Germany: Dolnośląskie, Wielkopolskie and Śląskie. The lowest levels of GDP per capita are all found in the east of Poland: Lubelskie, Podkarpackie, Podlaskie, Warmińsko-Mazurskie, Świętokrzyskie (data taken from the Polish Office of Statistics, Główny Urząd Statystyczny, for 2016). Although the east suffers from a lack of infrastructure, these regions are eligible for financing from the EU cohesion fund, which is aimed at reducing inequality between regions (i.e., one of the goals of sustainable development). Such funds can be used to help, for example, develop clusters of innovative business, such as “aviation valley” in the Podkarpackie region (see L. Suwala and G. Micek [85]). However, these funds do not in themselves provide sufficient reason to locate in the eastern regions of Poland. There should also be other factors which can contribute to the long-term success of such businesses.

Significantly more females than males took part in the study. 72.7% of the study group were females, whereas 57% of students in higher education are female. Around a third of the study group came from settlements of population less than 5 thou., and a similar number came from cities (population above 100 thou.). Approximately 22% came from large towns (population between 20 thou. and 100 thou.), while about 14% came from small towns (population between 5 and 20 thou.). Almost two thirds of the students were undergraduates, approximately a quarter were masters students, while 11% of students followed a different form of studies (most commonly a combined undergraduate/masters course, but there were a small number of doctoral students). The vast majority

of the participants were full-time students. Part-time students constituted only 2.47% of the study group. Almost half of the participants were studying a course in the social sciences (49.6%), 14.7% a course in the humanities, 10.6% in science and 9.8% in teaching.

**Table 1.** Structure of the study group based on where the study was conducted, which regions the students originally came from and the size of their hometown.

Region	Number of Participants Studying in the Regional Capital	Number of Students Coming from the Region	Percentage of Students Coming from Settlements of Population Less Than 5 Thou. (in %)	Percentage of Students Coming from Settlements of Population between 5 and 20 Thou. (in %)	Percentage of Students Coming from Settlements of Population between 20 and 100 Thou. (in %)	Percentage of Students Coming from Settlements of Population above 100 Thou. (in %)
Dolnośląskie	96	77	28.6	16.9	26.0	28.6
Kujawsko-Pomorskie	100	100	25.0	16.0	15.0	44.0
Lubelskie	88	110	37.6	13.8	22.9	25.7
Lubuskie	100	112	29.5	22.3	27.7	20.5
Łódzkie	100	114	23.0	8.0	21.2	47.8
Małopolskie	96	54	42.6	11.1	14.8	31.5
Mazowieckie	88	83	27.7	10.8	15.7	45.8
Opolskie	96	69	33.3	27.5	24.6	14.5
Podkarpackie	100	108	66.4	10.3	16.8	6.5
Podlaskie	96	113	25.0	13.4	26.8	34.8
Pomorskie	100	83	22.9	10.8	26.5	39.8
Śląskie	96	138	23.4	11.7	23.4	41.6
Świętokrzyskie	100	104	45.2	7.7	18.3	28.8
Warmińsko-Mazurskie	96	95	25.3	18.9	30.5	25.3
Wielkopolskie	100	90	28.9	16.7	26.7	27.8
Zachodniopomorskie	88	89	20.5	17.0	18.2	44.3
Outside Poland	n.a.	1	n.a.	n.a.	n.a.	n.a.
Poland	1540	1540	31.4	14.3	22.4	32.0

Source: Authors' survey.

The study group is uniform in terms of age, social status and level of education. As such, it would be difficult to make conclusions about the general population. Nevertheless, based on studies regarding the inheritance of systems of norms, values and beliefs for example: [24,53–55], it was assumed that the participants represent the social capital of the region from which they come and socialization is an important factor of this capital. Hence, in the opinion of the authors, conclusions about the social capital of a region are justified on the basis of young adults originating from that region.

#### 4. Social Capital amongst Students in Poland

##### 4.1. The Results of the Questionnaire

Competitive advantage is not just built on competitiveness but also on the ability to cooperate when appropriate. This does not entail the more efficient use of resources but relies on an appropriate business strategy, which often includes cooperation within the framework of a network. Enterprises that function in regions where there is a high level of social capital have a greater chance of success. Based on this assumption, the authors analysed the opinions of members of the study group regarding the effectiveness of four types of strategy and their level of intention to adopt the type of strategy seen to be the most likely to bring success. From the arguments made above, it is assumed that members of the study group who state that “cooperation in line with the law is the type of strategy most likely to bring success” and that they intend to follow such a strategy exhibit a high level of social capital. The associations of these declarations with behaviour in experimental games designed to illustrate trust, trustworthiness and aversion to inequality are analysed, in order to verify this assumption.

By running a business in a particular region, or in a particular type of settlement (rural/small town/urban), one may obtain a rent from the social capital associated with that location. Locations will be analysed from this point of view. On one hand, the character of a region in terms of entrepreneurship, its society and culture may lead it to being particularly attractive from the point of view of investment, due to the associated system of norms, values and beliefs that have evolved. On the other hand, the type of settlement will also modulate this social capital and the type of social structures that arise.

Studies on social capital often highlight specific differences between the nature of social capital in urban and rural environments.

Over half of the respondents indicate that the type of strategy that is most likely to lead to success is based on cooperation in line with the law. Almost 20% indicate that cooperation on the borders of the law is most likely to bring success. Only a quarter of those surveyed indicated that the strategy most likely to bring success involves individual effort.

From the point of view of social capital, it is most favourable for firms to locate in areas where the inhabitants see that it pays to cooperate in line with the law. Residents who appreciate individual effort in line with the law are also valuable. Of those who see that it pays to act on the borders of the law, it is difficult to say whether it is more favourable for people to wish to cooperate or act individually. It seems reasonable to assume though that, from this set of people, those who see cooperation as the route to success are more likely to exhibit trust.

Individuals who see cooperation as the most likely road to success are more likely to state that this should be accompanied by acting in line with the law than those who see individual effort as being the most likely to bring success (73.7% vs. 63.7%, respectively) This may be due to the fact that acting on the borders of the law requires, as described above, a higher level of trust to one's confederates. In such a case, individual action is simpler.

There exist some differences regarding the type of strategy seen to be most likely to bring success at both the regional level and the level of urbanization. The larger the size of a student's home town, the lower the proportion of students stating that cooperation in line with the law (the most favourable answer from the point of view of firms and the economy as a whole) is the most likely route to success (Mann-Whitney test,  $p = 0.0038$ ). The larger a students' home town, the greater the proportion of students stating that cooperation on the borders of the law is the most likely to bring success (Mann-Whitney test,  $p = 0.0207$ , see Table 2).

**Table 2.** Strategies giving the greatest chance of success according to the region students come from and the size of their home town.

Region/Size of Home Town	Legal—Individual Effort	Legal—Cooperation	Borders of Legality—Individual Effort	Borders of Legality—Cooperation
Dolnośląskie	19.0%	55.6%	7.9%	17.5%
Kujawsko-Pomorskie	8.0%	62.5%	10.2%	19.3%
Lubelskie	13.5%	64.6%	6.3%	15.6%
Lubuskie	24.4%	48.8%	8.1%	18.6%
Łódzkie	18.8%	51.5%	10.9%	18.8%
Małopolskie	10.0%	60.0%	14.0%	16.0%
Mazowieckie	13.0%	60.9%	8.7%	17.4%
Opolskie	16.1%	58.1%	9.7%	16.1%
Podkarpackie	17.6%	54.9%	8.8%	18.7%
Podlaskie	14.7%	57.8%	8.8%	18.6%
Pomorskie	6.2%	47.7%	10.8%	35.4%
Śląskie	22.5%	49.5%	5.4%	22.5%
Świętokrzyskie	14.6%	51.7%	7.9%	25.8%
Warmińsko-Mazurskie	16.7%	56.4%	10.3%	16.7%
Wielkopolskie	20.5%	52.1%	11.0%	16.4%
Zachodniopomorskie	13.7%	53.4%	11.0%	21.9%
Village (less than 5 thou. inhabitants)	15.3%	60.3%	7.0%	17.5%
Small town (5–20 thou. inhabitants)	16.9%	58.2%	7.4%	17.5%
Large town (20–100 thou. inhabitants)	17.2%	53.1%	11.4%	18.3%
City (above 100 thou. inhabitants)	15.0%	50.7%	10.4%	23.9%
<b>POLAND</b>	<b>16.0%</b>	<b>55.2%</b>	<b>9.1%</b>	<b>19.7%</b>

Source: authors' study.

There also exists regional variation in the proportion of individuals stating that cooperation in line with the law is most likely to bring success. The highest proportions are observed in the Lubelskie and Kujawsko-Pomorskie regions (64.6% and 62.5%, respectively) and the lowest levels are observed in the Pomorskie and Lubuskie regions (47.7% and 48.8%, respectively, see Table 2). The highest proportions

indicating that individual effort in line with the law are observed in the Lubuskie and Śląskie regions (24.4% and 22.5%, respectively), while this is stated by only 6.2% and 8% of the respondents from the Pomorskie and Kujawsko-Pomorskie regions, respectively. Students from the Pomorskie region are the most likely to state that cooperation on the borders of the law is the surest route to success (35.4% compared to the overall average of 19.7%). On the other hand, students from the Małopolskie region are the most likely to state that individual effort on the borders of legality is the surest route to success (14%).

From the point of view of firms choosing a business location, the most favourable regions are those in which individuals state that the most likely route to success is by acting in line with the law. Based on this, the most “law-abiding” region (regardless of whether this is accompanied by individual effort or cooperation) is Lubelskie (78.1%). In a number of regions, this proportion is above 73% (Dolnośląskie, Opolskie, Mazowieckie, Lubuskie, Warmińsko-Mazurskie). Apart from the Mazowieckie (Warsaw) region, these regions were all part of Germany until 1945. The Pomorskie region again appears in a negative light according to this measure (53.9%).

According to the size of a student’s hometown, the most favourable locations are villages (less than 5 thou. inhabitants) and small towns (from 5 to 20 thou. inhabitants), where more than 60% and 58%, respectively, of the respondents declared that cooperation in line with the law was the most likely to bring success (see Table 2).

Stating that a given type of strategy is the most likely to bring success does not mean that a student intends to apply such a strategy. Hence, the questionnaire asked whether a respondent intended to implement such a strategy or not. Almost  $\frac{3}{4}$  of the study group stated that they intended (answer “yes” or “probably”) to follow the strategy that they stated was the most likely to bring success. However, this proportion is strongly dependent on the type of strategy seen to be the most likely to bring success.

91.3% of those stating that individual effort in line with the law and 94.4% of those stating that cooperation in line with the law answered that they intend to apply such a strategy (“yes” or “probably”). However, only 27% of those who declared that acting on the borders of the law was most likely to bring success stated that they intended to use such a strategy (chi-square test of independence,  $p < 0.001$ , see Table 3).

**Table 3.** Level of intention to follow the type of strategy seen to be the most likely to bring success.

Strategy	Do You Intend to Implement Such a Strategy in Your Own Life?					Total
	Yes	Probably	Probably Not	No	Difficult to Say	
Legal—individual (1)	31.90%	59.40%	0.50%	0.00%	8.20%	100.00%
Legal—cooperation (2)	38.50%	55.90%	2.00%	0.40%	3.20%	100.00%
Borders of legality—individual (3)	5.10%	22.00%	26.30%	21.20%	25.40%	100.00%
Borders of legality—cooperation (4)	7.00%	20.30%	27.30%	19.10%	26.20%	100.00%
<b>Total</b>	<b>28.20%</b>	<b>46.30%</b>	<b>8.90%</b>	<b>5.90%</b>	<b>10.60%</b>	<b>100.00%</b>

Source: authors’ study.

The fact that somebody does not intend to follow a strategy seen to be the most likely to bring success may well result from a cognitive dissonance between behaviour that is seen to be successful and behaviour that is seen to be acceptable. The statement that behaviour on the borders of legality is most likely to bring success is strongly associated with a low level of intention to follow such a strategy. On the other hand, there is no significant association between stating that individual effort is the most likely to bring success and the level of intention to use such a strategy [86]. This indicates that individualistic behaviour is seen as socially acceptable in Poland.

There is very little regional variation in the proportion of individuals stating that the strategy that is most likely to bring success involves acting in line with the law. This proportion varies between 75% and 100% and the coefficient of variation is less than 0.1 in the case of the strategy “individual effort in line with the law” and 0.063 in the case of the strategy “cooperation in line with the law.” The degree of regional variation in the proportion of individuals stating that the strategy which is most

likely to bring success involves acting on the borders of the law is greater. This is unsurprising, since a smaller number of individuals state that a strategy involving behaviour on the borders of the law is the most likely to bring success. The largest proportion of students stating that the strategy most likely to bring success involves cooperation on the borders of the law was observed in the Pomorskie region. At the same time, the students in this region declared the highest level of intention to follow such a strategy. This may indicate that there exists a type of feedback relationship between observing that such a strategy is effective and acceptance of such strategies. Such feedback is potentially very dangerous from the point of view of building social capital at regional level. On the other hand, the number of students in each region is not particularly large and thus further studies are required to assess the strength of such feedback (if it exists).

We now consider the proportion of individuals stating that they intend to implement the type of strategy which they state to be the most likely to bring success. Among students who stated that such a strategy involves individual effort on the borders of the law, the largest proportion intending to use such a strategy was observed among students from villages and small towns (above 42% in villages and small towns). On the other hand, only 15–20% of students from large towns and cities declaring that the strategy most likely to bring success involved individual effort on the borders of the law stated that they intended to follow such a strategy. Although the number of students stating that individual effort on the borders of legality is relatively small, this association is statistically significant (Mann-Whitney test,  $p = 0.027$ ).

On the other hand, those from large towns and cities who stated that the strategy most likely to bring success involves cooperation on the borders of the law more commonly intended to follow such a strategy than those from villages and small towns (30–33% vs. 15–25%, in this case the difference is not statistically significant). It thus appears that the inhabitants of large towns and cities who see acting on the borders of legality as the most likely road to success declare themselves to be more trusting, although such a type of trust is not an indicator of positive social capital.

Taking into account the answers to both of these questions, it is possible to derive the percentage of participants who both state that a given type of strategy is the most likely to bring success and declare that they wish to implement such a strategy (see Table 4).

**Table 4.** Proportion of individuals who both indicate a given type of strategy as being the most likely to bring success and intention to use such a strategy.

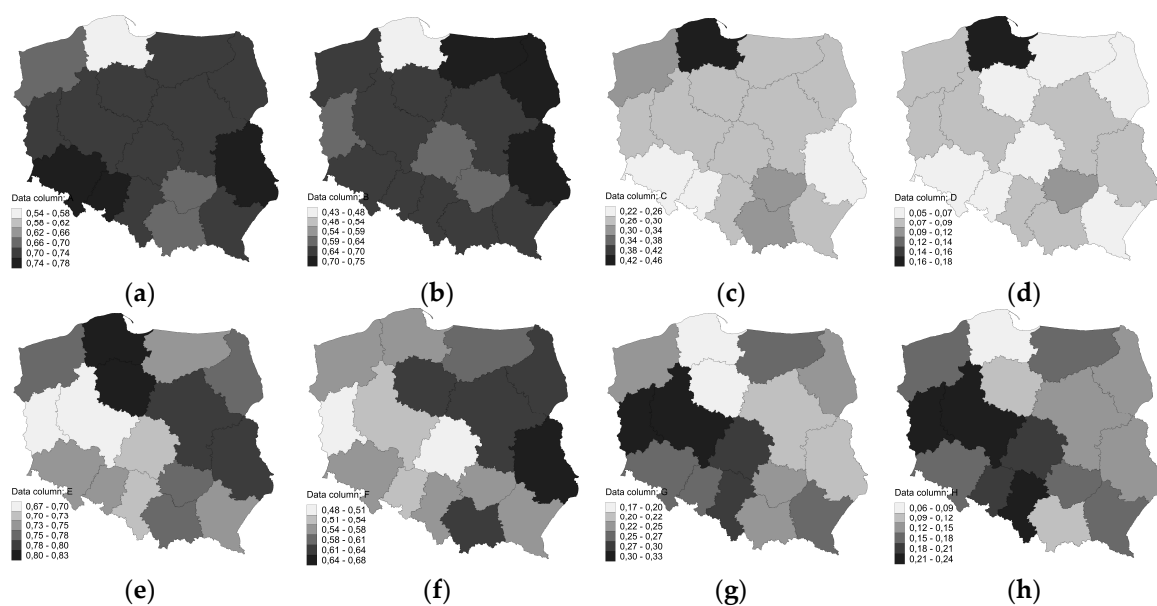
Region/Size of Home Town	Legal—Individual Effort	Legal—Cooperation	Borders of Legality—Individual Effort	Borders of Legality—Cooperation
Dolnośląskie	14.3%	54.0%	1.6%	3.2%
Kujawsko-Pomorskie	8.0%	61.4%	3.4%	2.3%
Lubelskie	12.5%	62.5%	2.1%	5.2%
Lubuskie	23.3%	40.7%	1.2%	7.0%
Łódzkie	15.8%	47.5%	5.0%	2.0%
Małopolskie	8.0%	58.0%	4.0%	4.0%
Mazowieckie	11.5%	55.1%	1.5%	7.3%
Opolskie	16.1%	50.0%	3.2%	3.2%
Podkarpackie	14.3%	53.8%	3.3%	3.3%
Podlaskie	13.7%	56.8%	1.0%	4.9%
Pomorskie	4.7%	38.4%	1.5%	16.9%
Śląskie	20.7%	48.6%	1.8%	7.2%
Świętokrzyskie	14.6%	49.4%	3.4%	6.7%
Warmińsko-Mazurskie	16.7%	56.4%	1.3%	3.9%
Wielkopolskie	19.1%	48.0%	2.8%	5.5%
Zachodniopomorskie	13.7%	52.0%	2.8%	5.5%
Village (up to 5 thou. inhabitants)	14.50%	57.54%	3.00%	4.25%
Small town (5–20 thou. inhabitants)	15.88%	53.95%	3.17%	2.64%
Large town (20–100 thou. inhabitants)	16.21%	50.34%	1.72%	6.20%
City (above 100 thou. inhabitants)	12.56%	47.58%	2.17%	7.25%
<b>POLAND</b>	<b>14.61%</b>	<b>51.79%</b>	<b>2.43%</b>	<b>5.29%</b>

Source: authors' study.

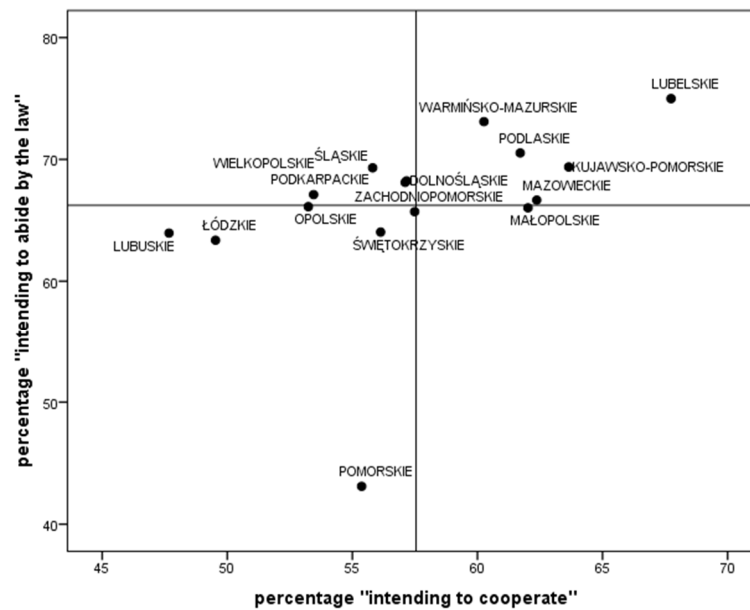
The largest proportion of participants who simultaneously declare both that the strategy most likely to bring success involves cooperation in line with the law and that they intend to follow such a strategy are found in the Kujawsko-Pomorskie and Lubelskie regions (above 60%). The lowest such proportions are found in the Pomorskie and Lubuskie regions (38–40%). A relatively high level of readiness to employ a strategy based on individual effort in line with the law is found in the Lubuskie and Śląskie regions (above 20% of the respondents state both that such a strategy is most likely to bring success and that they intend to implement such a strategy). The lowest such proportion is found in the Pomorskie region (4.7%). One may distinguish spatial variation in the proportion of individuals who simultaneously state both that cooperation in line with the law is the most likely to bring success and that they intend to implement such a strategy: this percentage is very high in eastern Poland (as well as Dolnośląskie). On the other hand, in western Poland and Warmińsko-Mazurskie (previously areas of Germany) there is a relatively high proportion of participants stating both that individual effort in line with the law is most likely to bring success and that they intend to follow such a strategy.

Taking into account the two components that define a strategy type (i.e., the cooperation/individual effort dimension and the legal dimension, see Figure 2), one can see the following:

- Cooperation is most prevalent in eastern and north-eastern Poland, while individual effort is most commonly declared in western and south-western Poland.
- Based on data aggregated at the level of regions, there is a strong correlation between the proportion of participants both stating that the strategy most likely to bring success involves acting in line with the law and intending to follow such a strategy and the proportion of participants both stating that the strategy most likely to bring success involves cooperation and intending to follow such a strategy (Spearman's correlation coefficient,  $r = 0.6353$ ,  $p = 0.0098$ , see Figure 3).



**Figure 2.** Cooperation and acting in line with the law—proportion of respondents that (i) state that the strategy most likely to bring success involves a given type of behaviour and (ii) both that the strategy most likely to bring success involves a given type of behaviour and that they intend to use it. (a) success is brought by observing the law; (b) together with intention to use such a strategy; (c) success is brought by acting on the borders of legality; (d) together with intention to use such a strategy; (e) success is brought by cooperation; (f) together with intention to use such a strategy; (g) success is brought by individual effort; (h) together with intention to use such a strategy. Source: authors' research.



**Figure 3.** Association at the regional level of the percentage of individuals both stating that the strategy most likely to bring success involves cooperation and intending to follow such a strategy (percentage “intending to cooperate”) with the percentage of individuals both stating that the strategy most likely to bring success involves observing the law and intending to follow such a strategy (percentage “intending to abide by the law”). The reference lines correspond to the relevant proportions in Poland as a whole. Source: authors’ research.

- Regional variance is not in general very high, but there are a few regions that deviate from the others:
  - There is a particularly high proportion of individuals in the Pomorskie region (18%) who both state that a strategy involving acting on the borders of the law is most likely to bring success and that they intend to use such a strategy (for the country as a whole, this proportion is 8%). Over 46% of the respondents from this region declare that such a strategy is the most likely to bring success (for the country as a whole, this proportion is 28.8%). The proportion stating that cooperation together with acting on the borders of legality is particularly high (35.4%). Pomorskie is the region in which the highest proportion of respondents state that the strategy that is most likely to bring success involves cooperation (independently of whether such cooperation is carried out in line with the law or on the borders of the law, 83% in the Pomorskie region, compared to 74.9% in Poland as a whole). On the other hand, only 55.4% of the individuals from Pomorskie state that the strategy most likely to bring success involves cooperation and that they intend to carry out such a strategy (below the proportion in the population as a whole). These results indicate a relatively high level of cognitive dissonance, since cooperation together with acting on the borders of legality is seen to be a successful strategy but is not socially acceptable.
  - A high proportion of participants from the Lubelskie region indicate a preference for cooperation in line with the law. The proportion of respondents from this region stating that a strategy acting in line with the law is most likely to bring success is 78.1% (compared with 71.1% in Poland as a whole) and 75% both state that such a strategy is most likely to bring success and that they intend to follow such a strategy (the highest in the country). Simultaneously, a very high proportion of respondents from the Lubelskie region indicate that the strategy most likely to bring success involves cooperation (above 80% and only marginally below the two regions with the highest proportion of such individuals, namely Pomorskie



and Kujawsko-Pomorskie). In addition, 67.7% of respondents from the Lubelskie region both state that the strategy most likely to bring success involves cooperation and that they intend to implement such a strategy (the highest proportion in Poland). One may conclude that the level of social capital is high in the Lubelskie region. These regions are rather heterogeneous in terms of geographical position and level of urbanization; thus, it is difficult to make more general conclusions.

- The Kujawsko-Pomorskie region also shows a high level of cooperation in line with the law (only minimally lower than in the Lubelskie region). Only 5.7% state both that the strategy giving the biggest chance of success involves acting on the borders of the law and that they intend to follow such a strategy (even lower than in the Lubelskie region). The proportion of respondents from this region both stating that the strategy most likely to bring success involves cooperation and that they intend to follow such a strategy is very high.
- Respondents from the Łódzkie region are more than twice as likely as respondents in Poland as a whole to declare both that individual effort on the borders of the law give the greatest chance of success and that they intend to follow such a strategy. Respondents from this region are also more likely to make such declarations about individual effort in line with the law. Hence, it is unsurprising that respondents from the Łódzkie region are less likely to indicate that cooperation is a road to success which they intend to follow—either in line with the law or on the borders of the law.
- The Lubuskie region also shows a relatively high level of individualism not necessarily in line with the law. Although, this is the region in which the highest proportion state both that individual effort in line with the law gives the greatest chance of success and that they intend to follow such a strategy, there is also a high proportion that make analogous statements regarding individual effort on the borders of the law (the fourth highest level behind Pomorskie, Śląskie and Mazowieckie). Unsurprisingly, there is a relatively small proportion of respondents in the Lubuskie region making the same statements regarding cooperation in line with the law. It should be noted that relatively high levels of individualism are displayed in regions to which there were high levels of immigration after WWII, that is, the regions formerly belonging to Germany and industrial/political centres. Such a relation between migration and the transmission of individualist behaviour to younger generations is unsurprising, see e.g., Lewicka [87].

Taking into account the size of a student's home town, it can be seen that the larger the student's hometown is, the smaller the proportion of respondents stating both that cooperation in line with the law is the most likely route to success and that they intend to follow such a strategy. This proportion falls systematically as the size of the hometown increases from approximately 57.5% to about 47.6% (Mann-Whitney test,  $p = 0.035$ ). On the other hand, the proportion of individuals stating that cooperation on the borders of legality rises as the size of a student's hometown increases (Mann-Whitney test,  $p = 0.028$ ) It should be noted that these proportions are taken from the set of respondents who gave valid answers to these two questions regarding the strategy seen to be most likely to bring success (1297 individuals).

It may be concluded that the most favourable environment for conducting business according to the level of social capital (ignoring other factors) is to be found in villages and small towns. It seems reasonable that, at least to some degree, this is associated with the regional distribution of social capital. The highest level of social capital is to be found in the eastern regions, which are generally rural areas.

#### 4.2. Declarations and Observed Behaviour

The declarations regarding the type of strategy seen to be most likely to bring success and the level of intention of respondents to use such a strategy are significantly associated with the observed behaviour of the study group in the experimental games and in each case the direction of such

associations agrees with our intuition (see below). Under the assumption that observed behaviour is more meaningful to scientific research than declarations, it may be concluded that the answers given to the strategy questions are informative.

Those who stated that cooperation in line with the law was most likely to bring success made on average the largest transfers in the *public good* game (see Table 5). Those who stated that cooperation on the borders of the law was most likely to bring success gave, on average, minimally less. These two groups gave significantly more on average than those stating that the strategy most likely to bring success involved individual effort (regardless of whether this was in conjunction with acting in line with the law or acting on the borders of the law). Those stating that the strategy most likely to bring success involved cooperation paid on average 62.3% of their funds into the pool, while those who stated that such a strategy involved individual effort gave on average 54.8% (two sample *t*-test,  $p < 0.001$ ).

A similar (though weaker) association was seen in the *trust* game. Those stating that the strategy most likely to bring success involved cooperation transferred 49.3% of their funds, while those who stated that such a strategy involved individual effort transferred on average 44.6%. This difference is only significant at the 10% level (two sample *t*-test,  $p = 0.072$ ).

Although differences in behaviour in the *public good* and *trust* game were visible according to whether respondents saw cooperation or rather individual effort bringing success, the amount offered by Player A in the *ultimatum* game and the amount returned by Player B in the *trust* game (see Table 5) showed differences according to the legal dimension of the strategy question. Those stating that the strategy most likely to bring success involved acting in line with the law offered the respondent on average 46.3% of the funds to be split, while those stating that such a strategy involved acting on the borders of the law offered on average 42.7% (two sample *t*-test,  $p = 0.0061$ ). Those offering even splits in this game are seen as having a high level of social capital [88]. In the *trust* game, those stating that the strategy most likely to bring success involves acting in line with the law return a greater proportion than those stating that such a strategy involves acting on the borders of the law (33.9% vs. 31.2%). However, this difference is not significant (two sample *t*-test,  $p = 0.1281$ ).

**Table 5.** Amount of money transferred or offered in the *public good*, *trust* and *ultimatum* game according to the type of strategy stated to be most likely to bring success.

Type of Strategy Declared to be the Most Likely to Bring Success:		Percentage of Funds Transferred in the <i>Public Goods</i> Game (Cooperation)	Percentage of Funds Transferred in the <i>Trust</i> Game by Player A (Trust)	Percentage of Transfer Returned in the <i>Trust</i> Game by Player B (Trustworthiness)	Percentage of Funds Offered in the <i>Ultimatum</i> Game (Aversion to Inequality)
Legal—individual effort	mean	54.08	43.91	34.19	46.65
	N	207	110	88	97
	standard deviation	23.34	26.44	20.48	11.17
legal—cooperation	mean	62.65	49.30	33.77	46.20
	N	716	359	313	357
	standard deviation	26.06	30.47	17.65	13.02
on the border of legality—individual effort	mean	55.97	46.04	30.87	40.71
	N	118	48	63	70
	standard deviation	27.07	28.34	21.11	17.51
on the border of legality—cooperation	mean	61.23	49.33	31.38	43.88
	N	256	135	110	121
	standard deviation	27.47	32.90	18.89	14.84
whole study group	mean	60.39	48.16	33.06	45.24
	N	1297	652	574	645
	standard deviation	26.21	30.21	18.74	13.77

Source: Based on authors' study. Calculated using the PS Imago package.

Regions in which observance of the law is valued should be treated as having a high level of social capital. In addition, at the regional level, valuing observance of the law is positively associated with valuing cooperation, which is also a positive component of social capital.

It is interesting that those stating that cooperation on the border of legality is the strategy that gives the biggest chance of success transfer on average high amounts in both the *public good* game

and the *trust* game (as Player A). In addition, in the *public good* game, amongst these participants, the amount transferred is increasing in the level of intention to follow such a strategy (Spearman's correlation coefficient,  $|r| = 0.1456$ ,  $p = 0.020$ ). Hence, it seems that those who intend to cooperate on the borderline of legality actually exhibit the highest levels of cooperation and trust (which can be justified theoretically). Such cooperation requires the highest level of trust (e.g., the mafia). On the other hand, this indicates that social capital cannot be measured simply in terms of trust (as often occurs). One should consider trust in the context of cooperation for the common good, in accordance with social and legal norms (as is done in this article—see Tables 5 and 6).

**Table 6.** Percentage of funds transferred or offered in the *public good*, *trust* and *ultimatum* game by those intending to follow the type of strategy declared to be the most likely to bring success.

Respondent States that He/She Will Follow or Probably Follow the Strategy that He/She Declares to Be the Most Likely to Bring Success:		Percentage of Funds Transferred in the <i>Public Goods</i> Game (Cooperation)	Percentage of Funds Transferred in the <i>Trust</i> Game by Player A (Trust)	Percentage of Transfer Returned in the <i>Trust</i> Game by Player B (Trustworthiness)	Percentage of Funds Offered in the <i>Ultimatum</i> Game (Aversion to Inequality)
Legal—individual effort	mean	54.47	43.98	34.57	47.03
	N	189	103	78	86
	standard deviation	22.92	27.02	19.31	10.64
legal—cooperation	mean	62.66	48.85	34.68	46.50
	N	676	340	295	336
	standard deviation	25.96	30.59	19.12	12.87
acting on the border of legality—individual effort	mean	53.91	39.17	33.62	42.25
	N	32	12	18	20
	standard deviation	29.75	24.29	22.14	13.91
acting on the border of legality—individual effort	mean	67.93	54.41	31.94	41.39
	N	70	34	34	36
	standard deviation	29.79	37.11	24.61	17.55
whole study group	mean	61.15	47.98	34.40	46.04
	N	967	489	425	478
	standard deviation	26.08	30.30	19.72	13.02

Source: Based on authors' study. Calculated using the PS Imago package.

## 5. Summary and Conclusions

The majority of Polish students declare that the type of strategy most likely to bring success involves cooperation in line with the law. A large majority of these individuals (94.4%) intend to implement such a strategy. It seems clear that other individuals also intend to follow such a strategy, although the structure of the questionnaire does not allow us to estimate this proportion. Taking into account the results of previous analysis [89,90], it seems that Poland is as favourable a place for investment as western Europe based on the level of social capital. A comparison of the results obtained in various European countries [89,90] indicates that the low level of generalized trust declared by Polish people in questionnaires is in line with the results of the *trust* game. However, the results from the *public good* game (which also reflect the level of trust) tell a somewhat different story. A meta-analysis of results from international studies does not indicate that Poland differs significantly from the countries of Western Europe, particularly with regard to trustworthiness. The level of trust exhibited in the *trust* game is lower than in Western Europe but not significantly lower.

In comparison to other countries, Polish students exhibited a relatively high level of cooperation and trustworthiness in experimental games and a comparable level of trust. In addition, it has been argued that a high level of trust might not always be an indication of a high level of social capital or a guarantee of cooperation for the common good [48–52]. Hence, one may conclude that the level of social capital in Poland is not lower than in other Western countries.

The larger the population of a student's hometown, the lower the percentage of students that feel that the type of strategy most likely to bring success involves cooperation in line with the law (the most desirable strategy from the point of view of firms and the economy as a whole), while the proportion stating that such a strategy involves cooperation on the borders of the law increases as the size of the student's home town increases. These variations are in line with theory: in small towns and

villages it is easier to control the behaviour of members of society, due to the nature and frequency of social contacts. In rural areas, the breaking of social norms and behaviour that is not in line with expectations is more likely to be noticed and punished. The lack of anonymity existing in small towns and villages is an incentive to be trustworthy, which is a foundation for building trust. Trust is an important component in developing cooperation. In larger agglomerations, anonymity becomes a factor enabling behaviour that is not in line with accepted norms: social, ethical, moral and even legal.

There exists regional variation regarding the percentage of respondents stating that the type of strategy most likely to bring success is cooperation in line with the law. This percentage is highest in eastern Poland and the Kujawsko-Pomorskie region and lowest in the Pomorskie and Lubuskie regions. This regional variation is associated with the variation in this percentage according to the size of a student's hometown, since eastern Poland is relatively rural. Overall, there is a tendency for those who see that the type of strategy most likely to bring success involves a cooperative approach to also state that such a strategy involves acting in line with the law. Respondents from western Poland, Śląskie and Warmińsko-Mazurskie relatively frequently chose individual effort in line with the law as the strategy most likely to bring success (these are areas which until 1945 had been under German influence and saw high levels of immigration after WWII). The Pomorskie region is an outlier with a high proportion of individuals stating that the strategy most likely to bring success involves cooperating on the borders of the law. This is associated with a relatively high proportion of such respondents who intend to use such a strategy. This could well be an example of the negative effects of feedback: when acting on the boundary of the law is seen to bring success by a sizeable proportion of a population, then it becomes acceptable to follow such a strategy.

Close to  $\frac{3}{4}$  intend to follow the strategy declared by them to be the most likely to bring success. This proportion shows very clear variation according to the type of strategy seen to be the most likely to bring success. A large majority of those who stated that the strategy most likely to bring success involves acting in line with the law, declared that they intended to follow such a strategy (94.4% of those indicating cooperation in line with the law and 91.3% of those who indicated individual effort in line with the law). On the other hand, only 27% of those who stated that the strategy most likely to bring success involves acting on the borders of legality, intended to follow such a strategy. This indicates that many of those who state that success is most likely to be gained by acting on the boundaries of the law feel a sense of cognitive dissonance, since they do not wish to follow such a strategy.

Kujawsko-Pomorskie and, in particular, Lubuskie are regions which exhibit a high level of social capital. The Lubuskie and Łódzkie regions exhibit low levels of social capital from the point of view that a high proportion of respondents from these regions do not regard cooperation as being the most likely route to success. On the other hand, the Pomorskie region exhibits a relatively high level of acceptance for behaviour on the borders of legality.

The declarations regarding the type of strategy assessed to be most likely to bring success and respondents' level of intention to use such a strategy are associated with their behaviour in experimental games in an intuitive manner. This indicates that these declarations are informative. The mean transfers in the *public good* game and by Player A in the *trust* game differed according to whether respondents thought that cooperation or individual effort was a component of the type of strategy most likely to bring success. Those who stated that such a strategy involved cooperation transferred more on average. The mean offers made by Player A in the ultimatum game and the proportion returned by Player B in the *trust* game differed according to whether respondents thought that acting in line with the law or acting on the borders of the law was a component of the type of strategy most likely to bring success. The offer of an even split in the *ultimatum* game indicates that a player observes the norm of equality. Player B returning a high proportion in the *trust* game indicates that an individual is trustworthy. Hence, regions in which there is respect for observing the law can be interpreted as having a high level of social capital. Additionally, in regions where there is respect for observing the law, respondents tend to exhibit a relatively high readiness to cooperate.

The study indicates that the willingness to cooperate in Poland does not differ from the level observed in Western Europe. Firms can obtain a rent from social capital by locating in areas with high levels of social capital, for example, in rural areas, where respondents exhibit a relatively high readiness to cooperate. Obviously, this is only one of a number of factors that should be taken into account when deciding where to locate an enterprise.

From the point of view of sustainable development, the results of the study indicate that the geographical distribution of social capital should not be a factor leading to increased inequality between the Polish regions but could be helpful in reducing such inequality. Our study indicates that the less economically developed regions, including the eastern regions and Kujawsko-Pomorskie, possess relatively high levels of social capital, which could be utilized to enable more balanced regional development in Poland.

The results of the study are in line with earlier research into the social capital of the Polish regions, particularly with regard to the variation in the form of social capital from east to west. J. Herbst [91] found that regions in the east are characterized by a high level of binding capital (the so called communal east vs. the confederative west with its high level of bridging capital). K. Janc [92] noted that active participation in societies is particularly popular in the south-east of Poland. He also noted a high level of social capital in the form of participation in organisations in the Kujawsko-Pomorskie region. T. Zukowski [93] notes that the areas of Poland which formerly belonged to the Austro-Hungarian and Russian empires (the south-eastern and eastern regions) are characterized by social capital typical of long-established familial-communal environments, including grassroots initiatives on behalf of the local community and the integral role of the church. The research of J. Działek [94,95] also indicates that the south-east of Poland possesses a high level of social capital, particularly in terms of social ties. Hence, such research indicates that the east and south-east of Poland possesses a particularly high level of binding capital. The literature on social capital often presents binding capital in a negative light compared to bridging capital. However, as stressed previously, this depends on the context. In the light of the studies of P. Swianiewicz et al. [96], the form of social capital exhibited in eastern Poland does not have a negative effect on socio-economic development but in fact may lead to achieving the goals of sustainable development. I. Maurer [97], P. Francois [98] and J. Grote [99] came to similar conclusions regarding the role of binding capital. Social capital of a binding nature helps in the initial development of firms and a region. Bridging capital is required at later stages in enabling innovation.

In the framework of our study, the research of Chloupkova et al. [100] is instructive. They considered the long-term history of cooperation in agriculture in both Denmark and Poland. They concluded that the “forced cooperation” imposed under the communist regime in Poland has had a clear negative effect on social capital and the economy in rural areas of Poland. Experience from the former Yugoslavia [101] indicates that it is difficult for external players to build social capital in a region that has been torn apart by conflict. The Rwandan Government of Nationality promoted civil society as a means to heal the wounds caused by the civil war [102]. Although, some progress has been made, there are many barriers to the reconstruction of social capital. In wider terms, these observations are in line with the research of Algan and Cahuc [24], who indicate that social capital evolves slowly and has long-term effects on development. Although Poland has developed rapidly since the economic transformation to a market economy began in 1989, past history still plays a role in economic and political life. Radkiewicz [103] notes the increasing polarization of the political scene in Poland. He argues that there is a divide between “conservative communitarians” and “liberal individualists” and that this divide results in large part from the lasting effects of the previous communist regime. On the other hand, while Ekiert et al. [104] acknowledge the challenge that this poses for continued development, they observe that civil society has developed in Poland in the period since 1989. Although they note that social capital, as measured by involvement in organizations, is lower than in Western Europe, there is a steady increase in the number of NGOs and there is hope that the civic society will continue to grow.

To conclude, the authors have investigated the relation between social capital in the regions of Poland and behaviour in experimental games designed to illustrate trust, trustworthiness and attitudes towards inequality, which are components of social capital. As well as being associated with long-term growth, social capital is also correlated with other elements of sustainable development, such as environmental protection and well-being. Social capital evolves slowly and is history dependent, as illustrated by the differences in the level of individualism observed between eastern Poland and regions to which there were high levels of immigration after WWII (former German regions and Warsaw). Although communism had a negative effect on the level of social capital in Poland, the levels of trust and trustworthiness exhibited by young Poles in the games considered are comparable with those in Western Europe. This bodes well for the future long-term economic development of Poland, although political polarization has increased in recent times. Although there is an east-west economic divide, there is a relatively high level of social capital in the poorer east of Poland. Despite eastern Poland having a less favourable geographical location (in economic terms) and less developed infrastructure, this social capital and EU developmental funds should serve to mitigate differentials in economic development and thus make development more sustainable. One of the ways of promoting such development is by developing clusters of innovative businesses, such as the so called “aviation valley” located around Rzeszów, the capital of the Podkarpackie region [85].

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