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Perceived Social Capital and Institutional Environment's Impact On the Success of Regional Cluster Policies

Abstract

Cluster policies (CPs) are said to be one of the crucial elements supporting the innovativeness of local and regional economies. However, what drives the success of CPs has not been made fully explicit. We tested the impact of perceived quality and strength of social capital (SC) and the formal institutional environment (FIE) upon CPs. We studied this relationship by applying structural equation modelling to data from quantitative CATI research on members of 20 cluster initiatives from four Polish administrative regions (NUTS 2), referred to as voivodships. We have revealed that the formal institutional environment has a strong influence on CPs, whereas, surprisingly, SC hardly matters.

Keywords

social capital (SC) | formal institutional environment (FIE) | cluster policies (CPs) | entrepreneurs' perception | structural equation modelling (SEM)

JEL Codes

O14, O25, C39

1. Introduction

A large group of socio-economic studies (e.g. Fukuyama, 1996; Karlsson, 2010; Putnam, Leonardi, & Nanetti, 1993; Woolcock, 1998) indicate that there is a positive relationship between the level of social capital and economic development. Equally widely described in the literature (e.g. Ketels & Memedovic, 2008; Ketels, 2013; Mills, Reynolds & Reamer, 2008; Porter, 2008) is the positive impact of clusters on economic development and competitiveness. However, the efficiency and relevance of regional cluster policies has been recently questioned (Grashof, 2021; Wolman & Hincapie, 2015). Some studies reveal that the impact of cluster policies on regional growth may be weaker than the effects of the other drivers, for example, research

and development capacity (Shin & Hwang, 2022). At the same time, institutions, framed in the form of organizations representing them (North, 1990), are the environment for the forging of cluster policies and the ecosystem for their popularization and implementation into political practice. This makes their regional configuration and characteristics hypothetically important determinants of the policies' success. As verified, selection of a regional cluster policy requires consideration of the institutional capacity needed to manage it (Burfitt & MacNeill, 2008).

Hence, in this paper, we test if there is a relationship between perceived social capital, the formal institutional environment that can foster cluster policies (Grillitsch & Asheim, 2017), and the success of cluster policies. In the paper, we go beyond

the traditional understanding of an industrial cluster (Karlsson, 2010) as either a complex agglomeration or social network (Gordon & McCann, 2000), but we focus on their formal representatives and elements understood as the cluster organisations and cluster members.

The paper draws on insights from institutional economic geography (Bathelt & Glückler, 2014), which constitutes a paradigm for considering how the processes of uneven and spatially differentiated economic development are shaped by the institutional setting and vice versa. We acknowledge that ‘institutions are not identical with rules and regulations but develop from repeated action that is related to them’ (Bathelt & Glückler, 2014, 356-357). Ebbekink and Legendijk (2013) argue that the academic discussion of cluster policies makes too strong a reference to the economic and geographic context and too weak a reference to the institutional context, and argue that building institutional structures contributes to the shaping of the administrative procedures of cluster policies. This article develops both of the themes they raise. The first is addressed by the scope of the topic; the second is confirmed by the results. At the same time, the article is wary of ‘soft institutionalism’, to which MacLeod (2001, p. 1146) attributes the tendency, manifested among both academics and politicians, to unreflectively explain uneven economic development by institutional thickness and social capital.

As Kušar (2011, p. 44) argues, regional development policies should aim to make institutions thicker; that ‘serves as an institutional precondition for building trust among all stakeholders in the development process, creating untraded interdependencies and stimulating technological development and networking’. Thus, he ties social capital and institutional thickness to dependence. Hence, in this paper, we aim to study the character and strength of mutual relations between social capital, the formal institutional environment, and the success of cluster policies.

There is no universally accepted definition of a cluster policy, and the self-explanatory nature of the term is only apparent. This leads to communication difficulties and confusion in the discussion of the impact and benefits of a range of mechanisms and tools qualified as elements of cluster policies (Lindqvist, Ketels, & Sölvell, 2013). For the purpose of the considerations carried out in this article, regional cluster policy is understood in a broad sense as all public activities calculated to create, support, or use institutional forms explicitly named clusters or

cluster initiatives for the implementation of public tasks. This definition addresses the basic challenge of conceptualising the success of cluster policies, which is its interregional comparability. For the purposes of the study, it was also assumed that a cluster is any entity that identifies itself as a ‘cluster’, and that is recognised or qualified as such in the assumptions or actions of regional policies. Therefore, in order for a cluster to occur, there needs to be a self-identification of its representatives with the formula referred to as ‘cluster’ and some form of externalization of it, susceptible to regional intervention.

As Lindqvist, Ketels and Sölvell (2013) estimate, ‘the EU [European Union] member countries that joined the EU after 2003 have often given more emphasis to cluster programmes than the older member countries’ (p. 49). Poland’s accession to the European Community almost coincided with the emergence of the first national clusters, which date back to 2003. In international reviews of cluster policies conducted in the early 2000s (e.g. Enright, 2003; Hospers & Beugelsdijk, 2002; Raines, 2000; Sölvell, Lindqvist, & Ketels, 2003), no cases from Poland are noted. Both factors—the intensity and relative novelty of the issue—are distinctive features of cluster policies compared to other advanced economies in the EU.

In the paper, we study two potential determinants of the success of cluster policies: quality and strength of social capital and the formal institutional environment using the entrepreneurs’ perception. We reveal that, in the examined, Polish-specific context, the formal institutional environment has a strong influence on cluster policies. Surprisingly, social capital hardly matters when it comes to what goes against existing policies that advocate boosting social networks.

2. Literature review

2.1. Social capital

The concept of social capital (SC) is widespread and popular among researchers in the economic and social sciences. As its impact on many economic and social dimensions remains unexplored (Westlund, 2006), the attractiveness of the approach is not exhausted. At the same time, there is no shortage of opinions about the excessive number of aspects and dimensions of the SC concept (cf. Claridge, 2018; Westlund, 2006). Following a number of researchers (Grootaert et al.,

2003; Putnam, Leonardi, & Nanetti, 1993), it can be assumed that the essence of SC lies in intersubjective norms (its normative dimension) and interpersonal linkages (its structural dimension). From the range of axes by which one tries to organise the phenomenon—such as bridging or binding relationship reach (Gittell & Vidal, 1998), individual or collective level of rootedness (Coleman, 1988; Lin, 2008) or emanation in the form of networks, citizenship or trust (Fukuyama, 2000)—these seem to be the ones most frequently used. While the components of the normative dimension predispose people to collective actions that serve the community, the components of the structural dimension make these actions probable (Krishna & Shrader, 2002). In this paper, it is assumed that SCs are networks of formal and informal social ties developed within a given localised community (Gordon & McCann, 2000) that empower, through their inherent norms, values and attitudes, the relationships of the members of the community and the community as a whole with individuals and groups from disparate backgrounds. Moreover, we also acknowledge that in some contexts SC impacts economic performance of companies (Westlund & Nilsson, 2005; Westlund & Adam, 2010) and economic development, in general.

The relationship between SC and cluster policy/policies has rarely been studied. The constructs analysed co-occur in the abstracts, keywords and titles of 11 publications indexed in the Scopus database and 9 indexed in the Web of Science database (as of May 2022). The relations between social capital and cluster policies are bidirectional (Champenois & Menu, 2012). Social capital both impacts and is impacted upon by cluster policies. In the paper, we assume that social capital may be a success factor of regional cluster policies. Since this relationship has so far been analysed in the literature in passing rather than deliberately, we have had limited opportunities to draw on the existing body of work.

Due to the positive relationship observed between SC, cluster policies and economic development, we argue there is a synergistic relationship between SC and cluster policies. The interplay of these variables is usually interpreted from three perspectives. First, researchers analyse the impact of SCs on the development of clusters (e.g. Champenois & Menu, 2012; Kim & Shim, 2018); second, conversely, they look at how the cluster formula contributes to building levels of SC (e.g. Felzensztein, Brodt, & Gimmon, 2014; Kowalski, 2013), and third and finally, they give consideration to clusters as a residual—a structure that

promotes the accumulation of a resource (e.g. Huber, 2009 Arif, 2012).

SC is sometimes treated as a natural attribute of the cluster, thanks to, among other things, access to and effective use of knowledge. This goes hand in hand with high levels of trust and the sharing of norms that are, for the development of clusters, immanent. In turn, trust and norms are perpetuated in the relationships that constitute clusters. According to Wolfe (2000), it is trust, which is a component of SC, that is the key clustering factor, and its slowly growing, territorially determined resource in a networked group of actors reduces the costs of their activities, and more generally, reduces market failure. A critique of such and similar approaches was carried out by Staber (2007), who called them a collection of loose, after all reasonable, proposals which do not add much to the knowledge of the relationship between SC and clusters.

SC can be seen as an ingrained resource in clusters that can be tapped or used for specific pro-development activities. The essence of this resource is the knowledge of cluster members, which they can mobilise through their own networks of relationships (Huber, 2009; Arif, 2012). The risk of investments undertaken in an innovative environment is lowered by the trust inherent in social capital (De Dominicis, Florax, & de Groot, 2013). Based on this trust, strong social ties reduce the costs of exchanging goods and services within clusters, regardless of their innovative or knowledge-based disposition. Additionally, with the interaction of structural embeddedness factors within clusters and the vision shared within their boundaries, they foster a more favourable allocation of their members' resources (Pulles & Schiele, 2013).

Relevant from the point of view of the dependency being analysed, the relationship between SC and cluster policies is usually considered *en passant* in the literature. An implicit, deductive conviction seems to be at work, which explains that since strong SC favours clusters, it simultaneously facilitates policies based on this model or directly supporting clusters (e.g. Ketels, 2013; Rosenfeld, 1997; Porter, 2008). This relationship is brought to the fore by Arzeni and Ionescu (2007, p. 190) who note that 'Designing policies targeting social capital in clusters seems a risky process because social capital is a self-enforcing, cultural and long-term process'. Considerations of the relationship between SC and cluster policies are, furthermore, discussed by Molina-Morales & Martínez-Fernández (2010) and Aragón et al. (2014).

However, no approaches have been identified that explicitly analyse how specific levels of social capital affect the success of cluster policies.

2.2. Formal institutional environment

We acknowledge that formal institutions facilitate or hamper collaboration and economic performance (Sahasranamam & Nandakumar, 2020). Based on seminal distinction between formal and informal institutions by North (1994) and our own deliberations, we have decided to use the term formal institutional environment (FIE) to include a set of the organisations that are guided by formal institutions, such as regional innovation systems, business environment institutions, and the quality and scope of regional public institutions' offerings to entrepreneurs. It often appears in the literature without reference to well-established definitions and without introducing specific terms of its own, suggesting that it is relatively self-explanatory. Its colloquial understanding can be reduced to the property of an entity (usually a territorial unit) having within it the presence of certain agents. It is close to or related to such concepts—which form part of the institutional approach in economic geography—as institutional capacity (Hassink & Lagendijk, 2001), institutional embeddedness (Johannisson et al., 2002), institutional spaces (Erkuş-Öztürk, 2008), institutional integrity (MacLeod, 1997), local milieu (Roxas et al., 2007), institutional capital (Rodríguez-Pose, 2013) institutional endowment (Levy & Spiller, 1994; Malmberg & Maskell, 1997) or institutional thickness (Amin & Thrift, 1995). The last two seem to describe the reality that most closely intersects with the proposed scope of FIE understood in this paper as a localised property consisting of 1) the existence of formal institutions tasked with initiating and guiding economic development, 2) the implementation by these institutions of these tasks, and 3) the networking of these institutions for the implementation of these tasks (Figure 1).

The construct of institutional thickness (IT), places institutions in the role of an important factor in development and helps determine 'the ability of a locality to chart its own economic destiny in the context of global capitalism' (Cocks, 2010, p. VII). Amin and Thrift (1995) put IT down to a combination of factors including inter-institutional relationships and synergies, collective representation of multiple constituencies, a common industrial goal, and shared

cultural norms and values. It is noted that the impact of IT on the economic development of regions depends not only on the accumulation, understood narrowly in economic terms, of institutions and the quality of their operation, but also on the framework in the form of educational institutions, technology transfer channels, financing mechanisms and industrial relations (Hassink & Lagendijk, 2001). The relationship between IT and FIE is introduced by Zukauskaitė et al. (2017, p. 336) who maintain that 'the definition of institutional thickness should focus on regional economic agents' perceptions of their institutional environment'. In the paper, we respond to this call by analysis entrepreneurs' perception of FIE and SC.

We acknowledge that IT creates an unwarranted temptation to explain economic territorial inequality in too reductionist a fashion. It is sometimes argued that it is not obvious what is the cause—high IT or level of development—and what is the effect (Glaeser et al., 2004), and that institutions are mistakenly identified with organisations (Coulson & Ferrario, 2007; Rodríguez-Pose, 2013). The last caveat is part of the broader problem of qualifying individual institutions as components of IT, which is compounded by the fact that some of them are interdependent and intertwined, making it challenging to reconstruct their regional configurations (MacLeod, 2001).

Institutional endowment (IE), in turn, is cited as one of several factors shaping national and regional industrial specialisations (Malmberg & Maskell, 1997). The researchers argue that 'it is the region's distinct institutional endowment—embedding knowledge and allowing for knowledge creation—which through interaction with available physical and human resources constitutes its capabilities and enhances the competitiveness of firms in the region' (p. 30). They follow North's (1994) understanding of institutions by claiming that IE includes basic values and resulting rules, norms and traditions (Maskell & Malmberg, 1999).

No literature was identified that explicitly analyses how specific levels of FIE affect the success of cluster policies (as of May 2022). The phrases 'formal institutional environment' and 'cluster policy' or 'policies' do not co-occur in the abstracts, keywords and titles of publications indexed in Scopus and Web of Science databases. There is neither a co-occurrence of institutional thickness and cluster policy/policies, nor a co-occurrence of institutional endowment and cluster policy(ies).

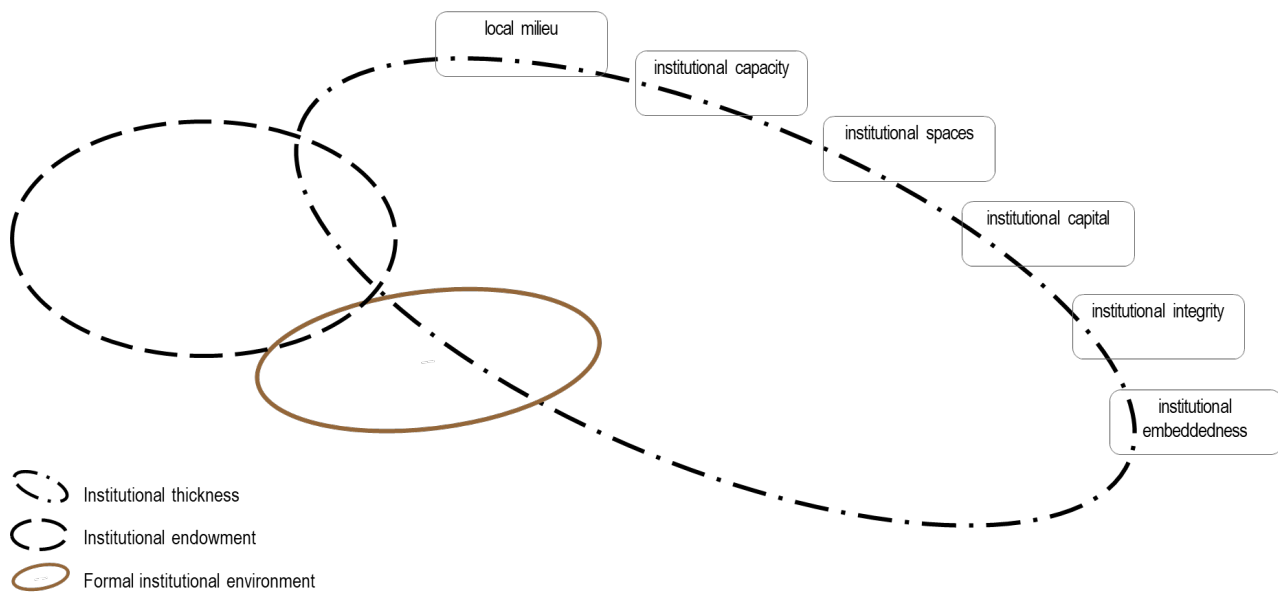


Figure 1. Intersecting scopes of reality delimited and described in the literature under the labels of institutional endowment (IE), institutional thickness (IT), and formal institutional environment (FIE)
 Note: range sizes reflect, indicatively, the depth and breadth of the relevant literature
 Source: own analysis

The hypothetical relationship between FIE and the success of cluster policies that we have been investigating is derived from considerations linking clusters to FIE-related approaches. Maskell and Lorenzen explain that cluster is geographically delimited with a highly specific institutional endowment (2004).

Maskell et al. (2002) place clusters in the concept of localised capabilities, of which he considers IE to be an element. This relationship is described and explained by Sæther (2014), who believes that IE integrates historical and contemporary aspects of localisation, and that the analysis of this property was initiated by Marshall's work on agglomeration economies. IE is in turn associated with Marshall's industrial district, which is the theoretical foundation for the development of the industrial cluster concept. This association relates to the dimension of inter-institutional interactions that lead to a sense of community in the business ventures being pursued. According to Amin (1994), IT is, through this dimension, one of the characteristics that constitute the essence of the industrial district. The relationship between IT and the industrial district is, in Marshall's terms, discussed at length by Henry and Pinch (2001).

The relationship between FIE, IE and IT and cluster policies should be viewed in the optics of a natural consequence of the relationship between these

properties and clusters. There has not been a stream of literature explicitly focusing on such a linkages, but in many publications the context of policy implications is uncontested (Mitchell et al., 2009; Taylor, 2010; Grillitsch & Asheim, 2017; Harris 2021). Grillitsch and Asheim (2017) examine whether the integration of institutional diversity can support cluster policy. Rooting territorial policies in institutional thickness is analysed by Maria Angeles Diez (2001) in relation to cluster policies. There seems to be no available approaches that would explicitly analyse how specific levels of FIE, IE, IT affect the success of cluster policies.

2.3. Success of cluster policies

The success of cluster policies (CPs) is not an established literature category. Academic approaches tend to focus on assessing the wider considerations related to the impact of cluster policies on development at a specific territorial scale. These approaches, however, do not relate the effects of interventions to objectives. The broad range of intervention implemented under the banner of cluster policies, the multiplicity of framings and interpretations of this banner in the academic and implementing circles, as well as the different local and regional conditions for conducting interventions, make it impossible to apply a universal measure for assessing success.

Evaluating the success of CPs may be subject to broader regularities defined for public policies in general. According to Compton et al.'s (2019) understanding, 'a policy is successful to the extent that it purposefully creates widely valued social outcomes through rigorous processes and manages to sustain this performance for a considerable period of time' (p. 123). From this point of view, the evaluation of success is done through the lens of specific, current goals, which makes it impossible to conduct it, or at least undermines the validity of conducting it, in an imitative manner, detached from contextual conditions and challenges. An additional circumstance that is significant for comparing the successes of CPs is that policies are phenomena that have 'multiple dimensions, often in some respects but not in others, according to the interpretation of the facts' (McConnell, 2010, p. 345).

A systemic approach to the issue of the success of CPs has been attempted by a small number of researchers. Wilson and Konstantinova (2014), as a consequence of their review of recommendations for cluster policies, note that each phase of a cluster policy involves a number of factors that determine the desired outcome of the intervention. Also in the logic of factors and conditions, the success of CPs is discussed by Kuberska and Mackiewicz (2022).

The success of a CP can be evaluated using a set of criteria. Evaluation, defined here as making judgments about the value of measured impacts of an implemented public policy (Venetoklis, 2002), provides a framework for systemic assessment of either a unique phenomenon, or a phenomenon containing unique components. The potential of its use to measure the success of CPs is reinforced by the fact that such intervention is followed by significant public resources (Kaźmierski, 2012). Evaluative criteria of effectiveness, relevance and efficiency are applied to cluster policies by, among others, the British administration (Ecotec Research & Consulting, 2004) while the utility of cluster policies is discussed by Ketels (2013). Effectiveness and utility proved particularly useful for research conducted from an ex-post perspective, based on field methods.

Weresa et al. (2017) maintain that 'The scope and nature of interventions may vary across countries and regions, and therefore it is not possible to develop a uniform methodology for cluster evaluation' (p. 126). They point out the possible multidimensionality of evaluating the success of cluster policies. A review of methods and indicators appropriate for use in

evaluating cluster policies is offered by Schmiedeberg (2010). The multidimensionality of CPs that should be taken into account in their evaluation is noted by Merkl-Rachbauer and Reingruber (2012). They formulate a number of recommendations for the evaluation of CPs, relating to methodological and organisational issues. Kind and zu Köcker (2012) also point out the need to distinguish, for evaluation purposes, different dimensions of CPs. They also suggest different analytical planes that can be used when conducting an evaluation. The findings and recommendations mentioned here were used to operationalise SRCPs (see Section 4).

A model for evaluating CPs was proposed by Aragón et al. (2011). The need to use a wide range of instruments in evaluating the success of CPs has been noted by Giuliani et al. (2013), Maffioli et al. (2016) and Marešová et al. (2014).

Contemporary researchers addressing CPs present a strong case for using clusters to build economic growth. However, there is no consensus as to how clusters can be turned into a lever for development policy. There is also a research gap between knowledge about clusters, SC and FIE, which have been described in broad fashion and comprehensively defined, and CPs, which in practice are adrift and deprived of robust, unambiguous findings. The paper responds to these limitations and doubts, striving to determine the relevance of selected success factors of CPs. The main aim is to assess the relationship between the levels of regional SC (including its structural and normative dimensions) and FIE and the success of regional cluster policies (SRCPs) as measured by their effectiveness and utility. The following dual hypothesis will be tested: **the regional social capital (H1) and formal institutional environment (H2) exert a significant influence on the success of regional cluster policies.**

3. Study area

The paper adopts a regional approach, which is the one most commonly used in analyses of cluster-based policies, and focuses on four regions deliberately selected for having their capital cities that lack the potential of a metropolis (Metropolitan affiliation was conducted based on Smętkowski et al. (2009)). It was assumed that having a strong metropolitan centre could potentially strongly centralise the analysed

phenomena and weaken the regional dimension of the results. To exploit the explanatory power of the two key variables and bearing in mind the long duration of social processes (Braudel & Wallerstein, 2009; Gorzelak, 2009), the selected administrative regions, referred to as voivodships, have different cultural and economic backgrounds (Swianiewicz et al., 2000). The Zachodniopomorskie Voivodship contains territories whose historical development and planning happened under Prussian rule, before the region became Polish. The Kujawsko-Pomorskie Voivodship, formerly mostly under Prussian influence (during the time of the partitions of Poland which lasted from the late 18th to early 20th century and also included, among others, today's Świętokrzyskie and Podkarpackie Voivodships), underwent industrialisation in the 19th century. The Świętokrzyskie Voivodship contains areas with the background of Russian influence, with low levels of industrialisation. Finally, the Podkarpackie Voivodship has the background of a

former Austrian influence, under which it enjoyed relatively strong civic freedoms, but relatively low levels of industrialisation.

Selection based on different levels of economic development, entrepreneurship, technical infrastructure, urbanisation, self-governing traditions, etc. ensures representativeness allowing one to extrapolate within the range of the country and beyond. The selected regions (Figure 2) differ in terms of the level of development of social capital and formal institutional environment (based on such indicators as measure of social isolation, measure of association links or voter turnout for SC and measure of BEI activity, functioning of the regional innovation system or quality of services provided to companies by the local administration for FIE). The Kujawsko-Pomorskie and Świętokrzyskie Voivodships reveal weaker social capital and FIE indicators than the average in Poland, whereas in the Podkarpackie Voivodship bonding social capital is strong and FIE

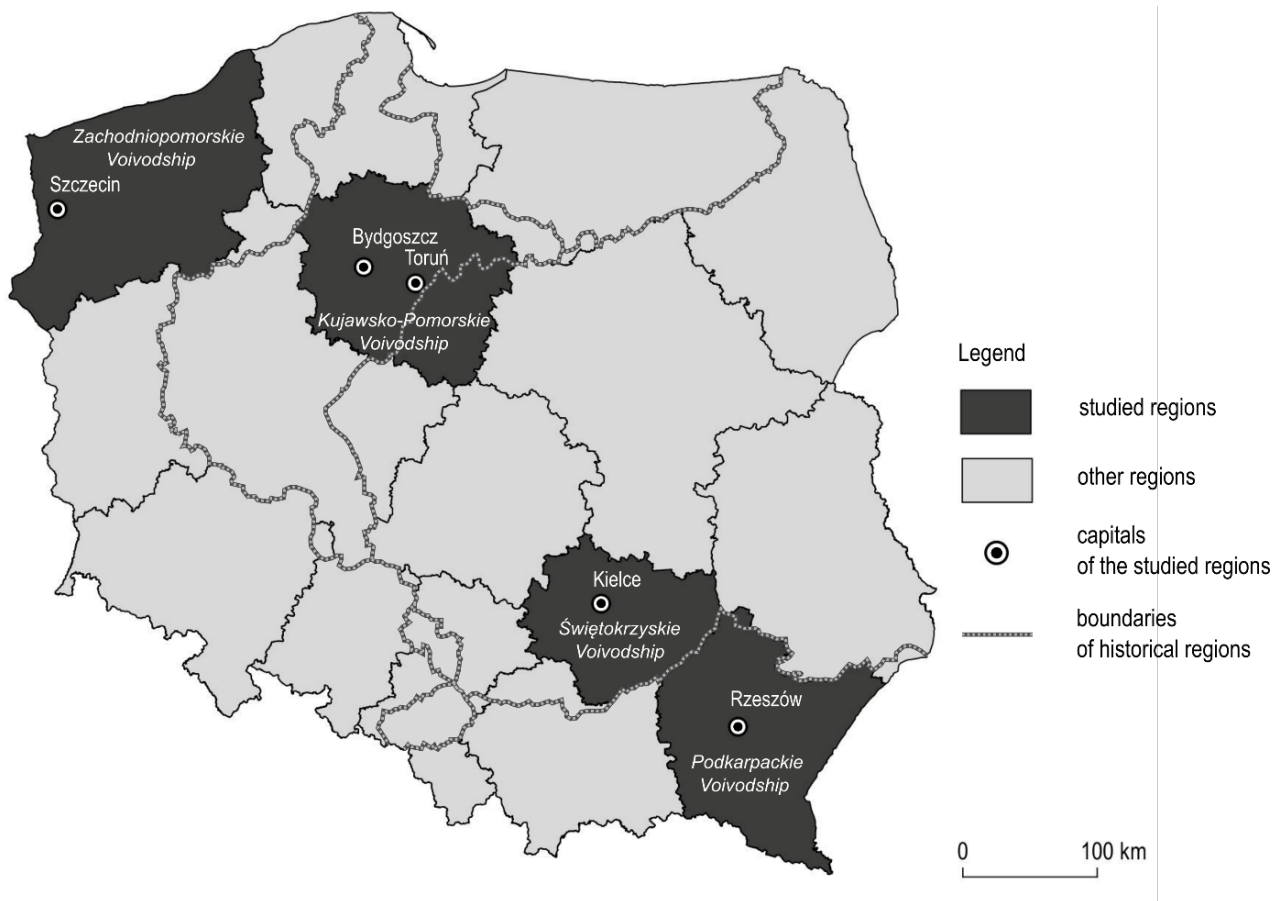


Figure 2. Study area

Note: boundaries of the historical regions are reconstructed, based on Bartkowski's (2003) description, after Działek (2011)

Source of cartographic base: Państwowy Rejestr Granic at <https://mapy.geoportal.gov.pl/> [accessed: May 2022]

Source: own analysis

the strongest in Poland. In the Zachodniopomorskie Voivodship strong bridging social capital was reported, whereas bonding social capital is weak and FIE is above the Polish average. It must be kept in mind that in this paper, we are looking at the perception of social capital and formal institutional environment among the entrepreneurs operating in clusters.

4. Data and methodology

The methodology is optimised in terms of the size and nature of the population examined. It consists of quantitative computer-assisted telephone interviewing (CATI) aimed at the entire population (N=816) of members of 20 cluster initiatives. The response rate was 43% overall, at least 37% at the regional level and at least 17% at the initiative level, and was achieved based on stratified sampling (the minimum response rate was assumed at 40% overall, 25% in regions and 10% in cluster initiatives), resulting in an n=337 research sample. In total, 20 cluster initiatives were selected, mostly as a result of an iterative call for 29 active initiatives that were identified as supported by regional cluster policies. The 16 coordinators pledged their cooperation and provided relevant incentives to their members. The other four were selected from among unsupported cluster initiatives as a control sample for other parallel studies. This dissimilarity did not significantly differentiate the results on the success of regional cluster policies, so the results shown in the article are based on members of all 20 clusters.

The literature analysis led to the selection of the most relevant indicators of the three meta-variables (FIE, SC and SRCPs) which, through statistical analysis, were used to build five constructs of the SEM formative model.

Understood over a long duration perspective, **SC** was treated, for the purpose of the considerations, as a broad, regional background to the implementation of cluster policies. The structural and normative dimensions of the essence of the phenomenon were inspected. In the normative dimension, the manifestations of citizenship were integrated. Eight indicators of regional social capital were extracted—four each for the structural and normative dimensions (Appendix). Each was measured by one assertion, which was assessed on a five-point Likert-type scale. In editing the statements, they were based on solutions

used or discussed in the multi-year project ‘Social Diagnosis - Objective and Subjective Quality of Life in Poland’, research by the Central Statistical Office (Bieńkuńska & Piasecki, 2020), the long-standing International Social Survey Programme, World Bank research (Grootaert et al., 2003). The claims used were standardised so that their interrelationships could be tested in a multivariate statistical structural equation modelling (SEM) procedure (Ullman & Bentler, 2012) (in an analogous fashion, the assertions for FIE and SRCPs were standardised). As the respondent’s agreement with a given statement increased, the level of conceptualised SC increased.

Constructing the understanding of **FIE** around the bodies tasked with initiating and steering economic development has determined a potentially broad set of institutions. The desire to also base the metavariable on a narrower view taking into account only the impact of institutions driving regional innovation and entrepreneurship, that is, high intensity processes in clusters (Gancarczyk et al., 2022; Kowalski, 2013), led to developing of a single indicator dedicated to institutions of the business environment, which were understood as and reduced (following Mażewska, Bąkowski, & Rudawska, 2021) to a set of innovation and entrepreneurship centres. Together with it, four indicators of regional institutional endowment were identified (Appendix). Each was measured by one assertion, which was assessed on a five-point Likert-type scale. The editing of the statements was based on the solutions proposed by Kobylińska (2013), Kondratiuk-Nierodzińska (2013), and the authors. As the respondent’s agreement with a given assertion increased, the level of conceptualised FIE increased.

The main challenge in the conceptualisation of the **SRCPs** was its interregional comparability. We recognised that the success of any policy is difficult to compare, since the specifics of territorial administrative units, the starting point and exogenous factors condition the course of interventions differently. In addition, the temporal scope of the study referred to three generations of cluster policies (corresponding to the three multi-year budget perspectives of EU funds available in Poland: 2004-2006, 2007-2013, 2014-2020) and activities that could qualify as cluster policies were launched at different times in the study regions, which raised the question of the appropriate phasing of success. It was therefore decided that universal measures of success should be sought at the expense of being able to assess the success of individual interventions related to regional specifics and specific

moments. The SRCPs was therefore related to general indicators of the dimensions of effectiveness and utility pertaining to parallel time intervals, i.e. from their first manifestations to the time of the study. Six indicators of the SRCPs were identified—three for the effectiveness dimension and three for the utility dimension (Appendix). They were assessed on a five-point Likert-type scale. In editing the statements and questions, they were based on solutions proposed by Enright (2003), Deloitte Business Consulting (2010), Plawgo et al. (2013), Tuziak (2018), and the authors. As the respondent's agreement with a given statement increased, the level of conceptualised SRCPs increased.

Originally, based on CATI survey data, the plan was to build a composite-based SEM model (Henseler, 2021) consisting of five emergent variables: three exogenous constructs (P3, P4, P5) and two endogenous constructs (P1, P2). This approach differs from classic SEM in that it does not analyse relationships between latent variables but between emergent variables. Because of the way constructs are built, the former approach is called the reflective measurement model while the latter is called the formative measurement model. This way of constructing structural equation models has been used in many fields, including the study of the effects of psychological capital, social capital and human capital on occupational stress (Li et al., 2021), the study of the drivers of smart hotels (Liu, Henseler, & Liu, 2022) or the study of attributes of a food delivery application (Fakfare, 2021).

Details of the indicators are provided in the Appendix 1. It was finally decided to include one endogenous variable P1+P2 (SRCPs) in the model, where P1 expresses the effectiveness dimension and P2 expresses the utility dimension, and two exogenous variables P3 (FIE) and P4+P5 (SC), where P4 expressed the normative dimension and P5 expressed the structural dimension. Reducing the number of indicators and combining constructs was based on analysis of the indicators' weights and loadings. As suggested by Hair Jr. et al. (2021), all indicators for which weights are significant should be included in the model. If the weights are not significant (P -value < 0.05), then the value of loading should be checked. If it is higher than 0.5 then the indicator is included in the model even if it is not significant (P -value < 0.05). This applied to indicators: P1_1, P1_3, P2_1, P2_3, P3_1 and P4_2. If the value of loading is less than 0.5 and at the same time is not significant, the indicator in question should be removed from the model. In this case, P4_1, P4_4, P5_1, P5_2 and P5_3 were removed (see Appendix 2).

The final form of the model (P3 + P4_P5 → P1_P2) was determined through several analytical approaches, in which the authors used different arrangements of exogenous variables and endogenous variables. For computational details and comments on the working versions of the models, see Appendix 3.

In the literature, constructs from formative models are called composites or emergent variables, and in structural equation model diagrams they are represented by either hexagons or ellipses—in the latter case the same as in reflective measurement models (Henseler 2021). Figure 3 shows a diagram of the relationship between endogenous constructs (P1+P2) and exogenous constructs (P3 and P4+P5). Two hypotheses are formulated: H1) FIE (P3) is positively correlated with SRCPs (P1+P2); H2) SC (P4+P5) is positively correlated with SRCPs (P1+P2).

A variance inflation factor (VIF) was used to assess collinearity for the outer model (measurement model) and inner model (structural model). No VIF measure exceeds a value of 5, and the vast majority are less than 2, confirming the absence of collinearity (Hair Jr. J.F. et al., 2021). The quality of the model was assessed by the RMSEA measure, CFI, GFI, NFI indices and the coefficient of determination R^2 .

5. Results

The quality of the measurement model is very high, as evidenced by the RMSEA measure =0.0107, CFI index =0.9988, GFI index =0.9768 and NFI index =0.9707. The coefficient of determination R^2 is 0.3376, which means that the model quantifies almost 34% of variance of a dependent construct (SRCPs).

Table 1 and Figure 4 show the values of path coefficients and loadings. The cSEM R package was used for the analysis. The model only partially confirms the hypotheses adopted in the paper. There is a significant relationship between FIE (P3) and SRCPs (P1+P2) and a non-significant relationship between SCs (P4+P5) and the said success. Thus, we managed to confirm hypothesis 1, but hypothesis 2 should be rejected. This is confirmed by the P -values and Cohen's effect sizes f^2 . In the case of the relationship between FIE (P3) and SRCPs (P1+P2), it exceeds the threshold value of 0.35 and can be considered a strong effect (Hair Jr. et al., 2021).

The two indicators that are most strongly linked to the regional FIE (P3), are: an educated, well-functioning regional innovation system (P3_3) and services

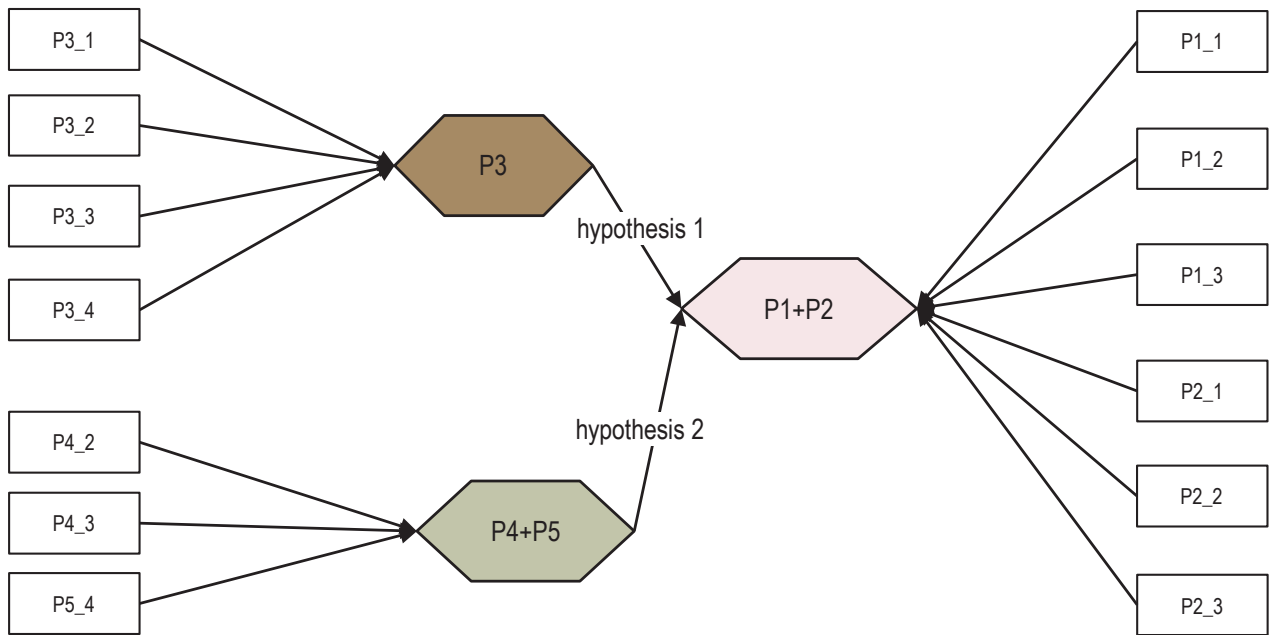


Figure 3. Schematic diagram of a composite-based SEM model for SRCPs
Source: own analysis

Table 1. Estimated path coefficients (resampling based on a bootstrap procedure)

Effect	Estimate	Standard Error	t- value	P- value	effect size (Cohen's f ²)
P3 → P1+P2	0.5543	0.0473	11.7219	0.0000	0.4266
P4+P5 → P1+P2	0.0775	0.0495	1.5647	0.1173	0.0083

R²=0.3376; adjusted R²=0.3336; RMSEA=0.0107; CFI=0.9988; GFI=0.9768; NFI=0.9707

Source: own analysis using R's cSEM package

offered by the institutional business environment that cluster members find attractive (P3_4). The first is related to the dimension of networking of institutions and refers to their wide-ranging coverage. The second confirms the high density of institutions in a narrow understanding of the term, reduced to innovation and entrepreneurship centres. Relatively the weakest, but at the same time statistically significant in terms of institutional endowment, is the quality of functioning of regional public institutions (P3_2). Most strongly related to SC (P4+P5) is the belief that people primarily try to help others (P4_3).

As for the emergent variable of SRCPs (P1+P2), for which the results are also valuable because the indicators used were, in view of the weak grounding in the literature, largely proprietary, this depends most strongly on the matching of support tools and instruments to the needs of cluster members (P2_2). The fact that an important need of cluster members

has been realised (P2_3) and there is a high level of cluster development (P1_2) are also relatively strongly related to SRCPs.

Table 2 shows the results for four separate models built for the Kujawsko-Pomorskie, Podkarpackie, Świętokrzyskie and Zachodniopomorskie Voivodships. The P-values for the Chin and Dibbern test for determining whether parameter differences between groups are significantly different were greater than 0.05, which means that the models in the subsets analysed are not significantly different (due to the value of the path coefficients). It is worth noting, however, that in the Zachodniopomorskie Voivodship both hypotheses were confirmed (P<0.05, both effects are significant), meaning that in this region SRCPs (P1+P2) is significantly affected by both the exogenous variable FIE (P3) and the exogenous variable SC (P4+P5), with the former construct having a much stronger impact (0.6538 versus 0.2011).

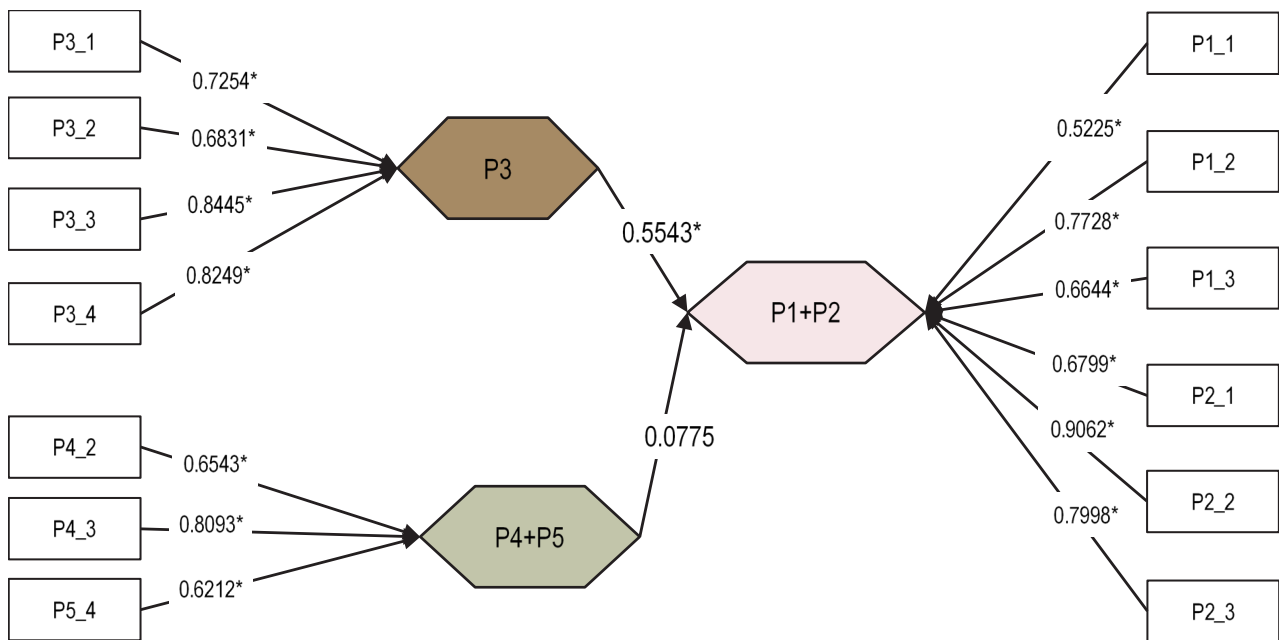


Figure 4. Composite-based SEM model for SRCPs
Significant relationships (loadings and path coefficients) are marked *
Source: own analysis using R's cSEM package

Table 2. Estimated path coefficients in a cross-section of the study regions

Effect	Estimate	Standard Error	t- value	P- value
Kujawsko-Pomorskie Voivodship				
P3 → P1+P2	0.4931	0.1000	4.9318	0.0000
P4+P5 → P1+P2	0.2160	0.1416	1.5247	0.1273
Podkarpackie Voivodship				
P3 → P1+P2	0.5402	0.0956	5.6497	0.0000
P4+P5 → P1+P2	0.1985	0.1053	1.8842	0.0595
Świętokrzyskie Voivodship				
P3 → P1+P2	0.4855	0.1665	2.9166	0.0035
P4+P5 → P1+P2	-0.2290	0.3013	-0.7601	0.4472
Zachodniopomorskie Voivodship				
P3 → P1+P2	0.6538	0.0713	9.1679	0.0000
P4+P5 → P1+P2	0.2011	0.0952	2.1132	0.0346

Source: own analysis using R's cSEM package

6. Discussion and conclusions

In light of the SEM analysis, there is a significant relationship between the regional level of FIE and SRCPs. The impact of the environment on success should be considered strong. In addition, a weak and statistically non-significant relationship between

the SC and the said success was identified. FIE has a stronger impact on effectiveness than on the utility of regional cluster policies. Two indicators have relatively the strongest impact on the level of inducing a positive FIE effect. These are an educated, well-functioning regional innovation system (Asheim, 2019; Asheim et al., 2019; Gancarczyk et al., 2020, 2022) and an offer of

business environment institutions which is adequate to the needs of cluster members.

Differing analytical findings on the actual impact of the two hypothetical factors on SRCPs make us look for explanations in the interplay of meta-independent variables. Hospers and Beugelsdijk's (2002) observation that the relationship between social capital and regional economic development is complex and heavily mediated by institutions is based on a belief in the inertia of the former. In this sense, it can be assumed that this inertia is the source of the factor's domination by the FIE level. Looking at the cluster in policy-driven optics, that is, as if it were a product of cluster policies rather than an objective concentration (Anić & Corrocher, 2022), results in the relegation of aspects of community and trust to the background, while emphasising opportunism, the strength of which can be amplified by a strong institutional base. The large role of regional policies in the emergence and development of clusters may, as a consequence, cause SC as a factor not to have the opportunity to externalise itself.

The lack of effect of SCs on SRCPs is in line with the findings of Staber (2007) who questioned this factor as a cluster-forming element and noted that the established regularities between social capital and entrepreneurship do not necessarily apply to clusters, as entities with different competitive patterns from market actors and a different development strategy. The result can also be interpreted in line with Taylor's (2010) recognition that there is a negative charge in networks, which makes opportunistic attitudes more likely, which in itself negatively affects the integration of clusters. Consequently, it may limit the success of policies based on their model.

The almost complete absence of statistical differences between regional models shows the relatively high spatial constancy of the dependencies observed at the level of the entire sample. The lack of similar studies does not allow one to set the results in the context of the literature.

As a limitation, it should be recognised that the CATI survey was primarily designed for the evaluation of SRCPs. The respondents were stakeholders and potential beneficiaries of the policies in question, making them natural, valuable respondents. The knowledge they provide in the capacity of SC and FIE cannot be taken as representative of the regions. It is therefore worthwhile, in further research, to supplement the measurement of regional SC and FIE levels with a component of literature indicators.

The strong impact of FIEs on SRCPs that was identified requires further reflection. The environment in question sometimes happens to be a non-limiting element of clustering interventions. Analyses conducted within the framework of this work show that cluster coordinators are often business environment institutions and patterns of public support further encourage clusters to organise themselves in such a manner. In this way, the difference between intervention in a narrowly defined FIE and in clustering becomes blurred and the benefits can become a commonality. The nature of this commonality is highlighted by the institutional environment indicator used in the cluster benchmarking conducted by the (Deloitte Business Consulting, 2010), in light of which public authority policy for cluster development is largely identified with the availability and functionality of business environment institutions. It is therefore worth discussing whether the levels of FIE identified in the article realistically affect SRCPs or whether they are, to a significant extent, part of that success.

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Appendix 1. The original outline of constructs and indicators

Constructs (latent variables)	Indicators (explicit variables)
P1: the SRCPs in terms of its effectiveness	P1_1 I have the conviction that my company/institution has at some time been covered by regional support P1_2 I consider the level of development of the cluster initiative of which my company/institution is a member to be high P1_3 Participation in the cluster initiative has positively translated into the level of development of my company/institution
P2: the SRCPs in terms of its utility	P2_1 I believe that the regional support tools and instruments available so far, directed at the establishment, development or guiding of cluster initiatives, were well suited to the needs of the initiative of which my company/institution is a member P2_2 The regional tools and support instruments available so far directed to the establishment/development/animation of cluster initiatives were well suited to the needs of my company/institution P2_3 Regional activities to date dedicated to clusters or cluster members have, in practice, led to the realisation of an important need of my company/institution
P3: FIE	P3_1 From the point of view of my company/institution, the offer of public services managed by regional institutions has so far/since joining the EU been broad P3_2 I believe that the quality of public regional institutions so far/since joining the EU has been high P3_3 I believe that the voivodship has developed a well-functioning regional innovation system P3_4 So far/since joining the EU, there have been many interesting services for my company/institution in the offer of regional business environment institutions
P4: the normative dimension of SC	P4_1 I believe that giving bribes is wrong P4_2 I believe that people can be trusted P4_3 I believe that people primarily try to help others P4_4 I believe that it is necessary for a person who wants to be a good citizen to participate in elections
P5: The structural dimension of SC	P5_1 I think it is imperative for people to be actively involved in the community P5_2 I believe that people should be members of some organisations, associations, clubs, parties, councils or circles P5_3 I think it is imperative for people to have a very good relationship with their neighbours P5_4 I believe that people should actively engage in volunteering

Source: own analysis

Appendix 2. Indicators removed from the model - summary of results

Indicators	Significance of weight (p-value)	Value of loading	Significance of loading (p-value)	Decision
P1_1	0.3807	0.5171	0.0000	OK
P1_2	0.0182			OK
P1_3	0.9602	0.6607	0.0000	OK
P2_1	0.9370	0.6800	0.0000	OK
P2_2	0.0000			OK
P2_3	0.0783	0.8094	0.0000	OK
P3_1	0.0666	0.7244	0.0000	OK
P3_2	0.0357			OK
P3_3	0.0001			OK
P3_4	0.0001			OK
P4_1	0.8627	0.0217	0.8803	indicator removed
P4_2	0.1001	0.6266	0.0002	OK
P4_3	0.0098			OK
P4_4	0.2676	0.2514	0.1839	indicator removed
P5_1	0.1621	0.1126	0.5619	indicator removed
P5_2	0.5443	0.1148	0.5895	indicator removed
P5_3	0.7647	0.1604	0.4151	indicator removed
P5_4	0.0030			OK

Source: own analysis using R's cSEM package

Appendix 3. Summary of the trials of model building

Model	Endogenous construct	Exogenous constructs	Remarks	Model fit
1	P1	P3, P4, P5	Due to the significance of weights and values of loading there is a need to remove indicators: P4_1, P4_4, P5_1	RMSEA = 0.050 R2 = 0.2370 adjusted R2 = 0.2301
2	P1	P3, P4+P5	P3 à P1 (estimate = 0.4505, P-value = 0.0000, Cohen's $f^2 = 0.2461$) P4+P5 à P1 (estimate = 0.0910, P-value = 0.0761, Cohen's $f^2 = 0.0100$) Due to the significance of weights and values of loading there is a need to remove indicator: P5_2	RMSEA = 0.010 R2 = 0.2329 adjusted R2 = 0.2283
3	P2	P3, P4, P5	Due to the significance of weights and values of loading there is a need to remove indicators: P4_1, P4_4, P5_1, P5_2, P5_3	RMSEA = 0.056 R2 = 0.3126 adjusted R2 = 0.3064
4	P2	P3, P4+P5	P3 à P2 (estimate = 0.5265, P-value = 0.0000, Cohen's $f^2 = 0.3704$) P4+P5 à P2 (estimate = 0.0822, P-value = 0.1002, Cohen's $f^2 = 0.0090$)	RMSEA = 0.009 R2 = 0.3076 adjusted R2 = 0.3034
5	P1+P2	P3, P4, P5	Due to the significance of weights and values of loading there is a need to remove indicators: P4_1, P4_4, P5_1, P5_2, P5_3	RMSEA = 0.045 R2 = 0.3406 adjusted R2 = 0.3346
6	P1+P2	P3, P4+P5	P3 à P1+P2 (estimate = 0.5543, P-value = 0.0000, Cohen's $f^2 = 0.4266$) P4+P5 à P1+P2 (estimate = 0.0775, P-value = 0.1173, Cohen's $f^2 = 0.0086$)	RMSEA = 0.011 R2 = 0.3376 adjusted R2 = 0.3336

Source: own analysis using R's cSEM package