Introduction: still running in circles

After more than a quarter of the century after the collapse of communism in Europe, an enormous amount of research has been conducted regarding the trajectories of change in different post-communist societies. It is safe to write that the processes of post-socialist transition, of their successful and less successful aspects, are well documented. Already in the middle of the 1990s, Jerzy Hausner, Bob Jessop and Klaus Nielsen stated that in light of so many emerging publications about Eastern European transformation, every author should have a very good reason for any additional enlargement of the already expansive corpus of literature (Nielsen et al., 1995: 3). The diversity of transformations has thus been reflected through a diversity of research. First, from detailed case studies, usually focused on the specifics (e.g. Klein & Pommer, 2002), to very broad and inclusive comparisons, usually focused on the search for more generalised explanations (e.g. Adam et al., 2005). Second, from the studies based on qualitative approaches (e.g. Bandelj, 2008) to the ones based on quantitative approaches (e.g. Dyker & Radosevic, 1999). Third, from the studies rich in empirical but mostly descriptive data (e.g. Berend & Bugaric, 2015) to the ones more focused on the theory (Hein, 2011). Finally, from the studies linked to specific issues or single theoretical perspectives, e.g. shock therapy vs. gradualism (e.g. Šušteršič, 2009; Bartlett & Prica, 2012; Dell’Anno & Villa, 2013), varieties of capitalism (e.g. Myant & Drahokoupil, 2012), transitional justice (e.g. Horne, 2014), democratisation, elites (e.g. Adam & Tomšič, 2012) to those trying to combine different aspects of the society in broad multi-causal analyses (e.g. Norkus, 2012).

As more successful post-socialist countries started their integration into the European Union and other transnational economic, political and military organisations, researching these countries has lost its appeal and has become “business as usual” in which these countries have become a normal part of the menu of comparative social research. However, from current perspective the situation looks completely different and a number of trends are fuelling continued research interest. The inability of the European Union, who have played important role in the transformation of these countries as a facilitator and moderator, to deal successfully with external shocks such as the economic crisis after 2008 or the more current migrant crisis, is increasing the interest in knowledge about the internal dynamics of these societies and some adverse trends like...
the notable shift towards more authoritarian forms of government (Berend & Bugarič, 2015), which juvenile domestic democratic institutions seem unable to prevent. On the contrary, in some cases it seems that the progress that was achieved in a quarter of a century of post-socialist development could be lost in a much shorter period of time. While a return to old-style undemocratic one-party regimes seems unlikely, many authors and commentators are researching the formation of soft forms of authoritarianism in some countries, jeopardising the rule of law and reducing the freedom of media.

Research on Eastern Europe is further enhanced by some major “infrastructural” trends. The major one is a dramatic increase in the availability of data, in many cases comparative and available free of charge or at least available relatively cheaply. This data covers a vast variety of topics, from the various dimensions of competitiveness (e.g. World Competitiveness Report, World Competitiveness Yearbook, Global Entrepreneurship Monitor), the various dimensions of human development (e.g. Human Development Report), democracy and governance (e.g. Freedom House, Transparency International, Worldwide Governance Indicators), innovations (e.g. Innovation Union Scoreboard, Regional Innovation Scoreboard), etc. Some of these indicators are business endeavours, especially competitiveness reports, some are major infrastructural efforts (e.g. European Social Survey) and some have clear ideological mission (e.g. Index of Economic Freedom). Regardless of the nature and motivation, access to this data implies that a substantial amount work can be done from behind a computer with simple internet access. Furthermore, this data is covering an increasingly large number of countries, including those in Eastern Europe. While at the end of the 1990s, many post-socialist countries were not included in these datasets, it is now increasingly rare to not be able to study most of them by the application of this data. In addition to this is the development of repositories of social research data – i.e. social science archives. Even in the cases when archived data is not comparative and it only provides information on specific society, it can nevertheless be used in configurational research in comparative case studies.

Another important trend is the continuous development of the positivist paradigm within social sciences, encouraged by the development and implementation of advanced statistical techniques, which are further enhanced with increased computational capabilities allowing the application of these techniques and larger datasets (Alvarez, 2016). In spite of the development of critical realist epistemology, positivism in comparative social research is encouraged by the fact that it is less labour-intensive than qualitative configurational comparative research. This research, while imperfectly following methodological rules for comparative research elaborated on by Przeworski and Teune in The Logic of Comparative Social Inquiry (1970) is generally assuming that qualitative research can be best at performing the explorative stage of a comparative research, which can then be followed by scientifically rigorous quantitative research. In spite of calls for the acknowledgment of the importance of qualitative inquiry in making the results and interpretations of quantitative research informative and meaningful (Allardt, 1990), there were, until relatively recently, no useful analytical techniques that would allow us to engage in configurational qualitative comparative research on a scale of more than a handful of cases. Some of the dilemmas in comparative research that Verba emphasised half of century ago when he proclaimed the revolution in comparative politics (Verba, 1967) still seemed to be troubling comparative researchers until relatively recently, especially the irreconcilable dilemma of the scientifically rigorous search for robust and complex general explanations vs. the detailed configurational approach, which is based on a relatively small number of cases and so by necessity leads towards (anti-theoretical) descriptive case-specific configurational conclusions. After all, “generalizations fade when we look at the particular cases” (Verba, 1967: 113). We still seem to be running around in circles. The situation may have started to change only relatively recently,
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when Charles Ragin offered his solution in the form of qualitative comparative analysis (Ragin, 2000, 2008).

In this chapter we will illustrate the applicability of Ragin’s fuzzy-set qualitative comparative analysis for comparative research on transformations. The illustration will be based on our attempt from 2005, presented in the book The Challenges of Sustained Development (Adam et al., 2005), to evaluate in a comprehensive and comparative manner the developmental achievements of transitions and accession to the EU in the countries of East-Central Europe and the socio-cultural factors behind these achievements. The key purpose of this chapter is not a detailed presentation of our findings, or to re-apply the model once again with the new data, or to re-visit the entire model from a new perspective – though this could be beneficial as well. Instead, the model, its considerations and testing, will only be briefly presented for the purposes of illustration, since very similar challenges and considerations are very likely to face a significant part of systematic comparative research in the future – dealing with the factors and results of post-communist (and other) social transformations.

The issues that will be addressed in this chapter include:

1. A theoretical model drawing from several relevant theoretical perspectives and their critical assessments, taking into account both long-term historical as well as contemporary factors, their complex interrelationships and causalities.
2. Some challenges of operationalisation of the factors in terms of indicators based on the combination of quantitative and qualitative assessments, providing a thorough critical reflection on the quality and validity of the indicators and datasets.
3. Presentation of the fuzzy set qualitative comparative analysis as the method applied to test the theoretical model.
4. Finally, we will provide some overall reflections based on our model and its testing and consider the ways for a more integral and synthetic study of social change in a cross-national context.

A heuristic model of socio-cultural factors of developmental performance

We assume that a comparative analysis of developmental performance requires a theoretical background as a basis for the heuristic model. In our case (Adam et al., 2005: 3–5) this has been based on a broad variety of theories, including the ones emphasising:

- The close interrelationship between socio-cultural and economic aspects already presented in the classical works of M. Weber, A. Marshall, T. Parsons, and more recently the theories of social capital.
- The adaptability of societies expressed in terms of competitiveness, with a particular emphasis on M. Porter’s concept of competitive advantages and on older I. Wallerstein’s world systems theory, especially its identification of core, semi-periphery and periphery.
- The shifts from simple to reflexive modernisation, linked to the increased significance of knowledge and the increasing need for the more sophisticated forms of coordination going beyond the old state vs. market dilemmas, only possible under high levels of quality of governance, entrepreneurial spirit and sufficient social cohesion.
• The significance of globalisation that establishes the conditions where nation states maintain a certain relevance and may thus still be considered as proper units of analysis but should be seen as increasingly dependent on the global context.

While considering the socio-cultural factors relevant for a given society, one should be able to distinguish between the thick historical factors that affect it in the long run on the one hand and the current and prospective factors that affect a society in a given moment of time on the other. While debating post-communist transformations, one should not ignore either of them. While some studies — such as R. Putnam’s theory of social capital (Putnam, 1993) — may be more inclined to emphasise the historical factors, others may be more oriented toward the current political, economic and formal institutional arrangements (e.g. Messner, 1997). We assume that only a combination of both approaches can fully address the issue of factors influencing the transformation processes in various societies.

In our heuristic model, the thick cultural patterns (Geertz, 1973) provided through the historical and geopolitical position of a given society have been presented as civilizational competence. The concept, partly borrowed from P. Sztompka (1993), should not be seen from a value-moral perspective (and even less so from a Western ethnocentric perspective) but more as a functional-instrumental capacity to develop a sufficient level of adaptability typical for the fully modern societies (Adam et al., 2005: 23–25). This has been the primary socio-cultural factor in our heuristic model — affecting the current and prospective socio-cultural factors.

The current and prospective factors, on the other hand, have been divided into two dimensions: the internal and the external. This distinction may be questionable for some ultra-globalists, the authors observing only a single “world society” (Luhmann, 1995) or the opponents of “methodological nationalism” (Beck, 2000). However, we argue that the differentiation of the global political system into nation states and their institutions (and their close connections to the clearly remaining socio-cultural and even economic divisions still mutually re-enforcing each other despite the obvious and omnipresent globalisation trends) still justifies the understanding of nation states based on societies (or countries) as possible units of analysis and allows — at least in heuristic terms — an analytical distinction between the internal and the external factors. Moreover, taking both of them into account without conflating them also allows one to overcome some traditional limitations of either the classical evolutionist and modernisation theories (often inclined to ignore the external factors) and, on the other hand, the dependency theories, traditionally being less able to observe the internal factors.

In our heuristic model, the internal current and prospective factors consist of the interactions between cognitive mobilisation, entrepreneurial spirit, the quality of governance and social cohesion. These interactions, however, should also be seen as mediated and enhanced by social capital. Their impact to developmental performance has been seen as combined with the impact of the external factors, which manifest themselves as economic, political and socio-cultural openness of the society to its global environments, encouraging the “importation” of capital, ideas, innovations and opportunities, which eventually become internal to society, even though they are external in origin.

Finally, the developmental performance in our heuristic model, has been understood in economic terms based on Porter’s understanding of economic development as “a process of successive upgrading, in which the business environment in a nation evolves to support and encourage increasingly sophisticated ways of competing” (Porter, quoted in Adam et al., 2005: 175–176). This conceptualisation goes well beyond simple economicistic identification of economic development by country-level income, which is too often prevailing in world-systems theory accounts (e.g. Babones, 2005) and allows us to create more sophisticated measures of economic development.
The model is presented in Figure 3.1. Clearly, based on different theoretical perspectives or even different policy goals, many other models of development may be developed (Adam et al., 2005). However, the challenges of indicators and measurements would remain quite similar, and some of these challenges have to be briefly addressed.

**Quality of indicators and datasets in comparative research**

‘Measuring’ socio-cultural factors of development in terms of the assessment of the situation in this area is a complex and demanding endeavour. Namely, we are speaking about phenomenon, related with human agency which is ‘by its nature’ highly changeable and thus hard to quantify. Some aspects of these factors are hard to apprehend directly. For this reason, proxy indicators are often used where one tries to detect the presence of certain property in an indirect way. There are numerous conceptual as well as methodological dilemmas and ambiguities related to all factors that were used in our model and operationalised in our empirical analysis.

Socio-cultural factors of development are not easy to conceptualise. They are all multi-dimensional entities, consisting of elements that are often strongly connected with other
concepts, with possible overlaps. With regard to the social capital, which is the core concept in our theoretical model, it is hard to determine causal relations in terms of whether it is a cause of a result of certain activities. For example, (generalised) trust as one of the most common indications of social capital could be perceived as its generator, dimension or its consequence. Civilisational competence as a factor that refers to the historical processes of modernisation is a particularly abstract concept for which it is impossible to provide adequate data sources, thus the analysis has to be carried out in a more qualitative way, combining historical data with geographical analysis. Cognitive mobilisation is characterised by the hierarchy between dimensions it consists of. One can differentiate between its ‘basic’ and ‘advanced’ aspects. There is a challenge to select indicators that would explain differences in a rather homogeneous group of countries. Furthermore, some factors lose their explanatory role as the countries develop; for example, while literacy of the population may be an important factor explaining the differences between peripheral and semi-peripheral countries, it cannot explain the developmental leaps of latecomers of formerly semi-peripheral countries that have become part of the developmental core. Regarding the quality of governance, there is a challenge of criteria selection since the definition of democracy as a type of polity to which the ‘quality’ is attached is not something clear and definite (there are ‘minimalist’ as well as more ‘extended’ definitions) (Tomšič, 2004). Entrepreneurial spirit is conceptually close to some other phenomena, related to developmental performance, such as competitiveness. It consists of different components and we often deal with dilemmas of which components are measured by specific indicators. The social cohesion is in conceptual terms relatively close to the concept of social capital (i.e. bonding social capital). Due to this, there are indicators that could be used to ‘measure’ both. An additional problem is that some of its aspects, like the level of consensus, are very difficult to measure. A similar situation is with the openness of societies. There are different aspects of openness, some of them (economic openness) are easier for operationalisation than others (socio-cultural openness).

In our empirical analysis, there is a relative underrepresentation of ‘objective’ indicators. Some of the indicators that are used fall within this category, for example, in the field of economics (such as GDP per capita as a measure of economic development or hourly wage for manufacturing workers – although even in such cases there are methodological dilemmas about the harmonisation of this data). Some other notable examples are: the educational structure of the labour force as an indicator of the level of education and learning (cognitive mobilisation), voting turnout as an indicator of the level of democracy (quality of governance), business R&D expenditure as an indicator of the mobilisation of resources (entrepreneurial spirit), Gini coefficient as an indicator of social (in)equality (social cohesion), or FDI flows as an indicator of economic openness (openness of societies). However, even in the cases when there are no serious methodological dilemmas, some of the hard data are of a limited explanatory value. For example, data on FDI flows is relatively inconclusive on the type of investments being made in terms of value-added and knowledge intensity. The same can be observed for softer indicators, for example, foreign-language proficiency as a measure of socio-cultural openness tells nothing about whether and how this knowledge is actually applied in the dissemination and internalisation of foreign ideas, perspectives and approaches.

What generally prevails in our study are ‘soft data’, i.e. data of opinion nature, particularly opinions of the citizens on different social phenomena and expert assessments of selected individuals. They are usually gathered through public opinion surveys (either on the general population or on specific targeted groups like managers) and through interviews or reports, provided by the experts. It is therefore worth understanding that numerical values of particular indicators are often more or less subjectively translated qualitative evaluations (for example, the numerated evaluation of the state of human rights). In some cases, quantification is even based on the
evaluation of a relatively small numbers of experts, a procedure that opens the door for unidentifiable bias. As a result, we cannot rely on only one indicator to measure the specific factor of development, even after we have carefully considered all the relevant methodological dilemmas. We have to use acquired data to construct indexes of wider categories. For interpretation purposes, the rank of a particular analysed unit (country) is often more useful than its numerical value (which, by itself, could not say much about the situation).

As mentioned, due to the character of our research topic, problems and dilemmas of ‘measurement’ are numerous. Here we will highlight four of them: accessibility, validity, reliability and transparency. Each of them is highly relevant for the quality of final research results.

Accessibility refers to the amount of relevant data that is available for the assessment of a situation in certain research field. The more abstract a concept is, the harder it is to find data that could serve for the purpose of evaluation and comparison. In our model, it was most difficult to find data on civilisational competence. Due to a lack of comparable and available statistical data, its indicators could not be satisfactorily quantified, measured and compared, especially if one takes into account the requirements and criteria for advanced statistical comparative research. Furthermore, although more and more countries are benefitting from the development of infrastructure enabling comparative research, we still have numerous examples of “missing values” for particular (groups of) countries, especially when it comes to more specific indicators or when we want to apply time-dimension. In our research, this was also the case with certain indicators on social capital. In such a case, one should try to combine data from different sources, with necessary consideration of possible methodological differences between them.

Validity refers to the relevance of selected indicators. Here we are referring to the common problem with selection criteria for the assessment of a situation in a particular field, i.e. the detection of the presence or absence of certain properties. This is related to the conceptual definition of concrete social phenomenon. There are diverging definitions of concepts like social capital, governance, social cohesion etc. that are part of our explanatory model. In order to select valid indicators, one has to provide a robust and straightforward conceptualisation of particular phenomena or at least clearly determine which conceptual approach is utilised in comparative research. For example, in examining the quality of governance, we link it to the ‘wider’ understanding of democracy as ‘extended polyarchy’ (Tomšič & Vehovar, 2012). It refers to governance as politics, i.e. the expression of different interests, political participation and competition between political actor; as well as governance as policy, i.e. the creation and implementation of policies concerning different spheres of society; to the institutional level as well as to the level of political agency. Only on the basis of such conceptualisation can one compose a set of indicators that refer to its relevant dimensions.

However, even in the case of conceptual consensus, the assessment of different social phenomena is not something unambigious. In empirical research, one can hardly avoid subjectivity and even ideological bias not only in the phase of conceptualisation (for a debate on this see Allardt, 1990) but also in the phase of the selection of indicators, i.e. the determination of which social facts or their manifestations are relevant as ‘benchmarks’ of the situation in the social area under consideration. The high degree of complexity that characterises modern society requires special efforts of researchers in the selection of ‘researched materials’. Furthermore, the selectivity is especially important in secondary analysis since it is in most cases not tailored to our specific operationalisation and it is often inevitable due to the fact that many social facts have not been measured at all and we have to focus on direct experience or available proxies from secondary sources, for example, media records or opinion survey data. Significance is often attributed to different publicly visible events, such as the various affairs which are subject to the “treatment” of mass media (whether they disclose them or devote a lot of attention to them).
doing so, it is often questionable whether such events reflect the actual situation or are exemptions that depart from usual practice.

Dealing with different social and cultural phenomena, one can often detect value orientations (which are generally very hard to ignore) or even the political motives of the researchers. The second danger is exaggerated normativism that in the absence of reliable indicators knowledge may lead to biased results. This approach is predominantly focused on normative or regulatory regime (i.e. the presence or absence of certain laws or institutional mechanisms), which is of course very important and an indispensable factor, but often not sufficient.

Furthermore, the analysis of socio-cultural factors of development often rests on qualitative assessments that are difficult to code or quantify, i.e. translate into numerical form. In this regard, the question is how much the numerical ratios and related differences between the studied countries match actual differences – for example, whether a twice higher estimate means that the situation is twice as good (or worse – depending on the definition), or is it just a ‘product’ of methodological operations.

As a result of these concerns, the creation of wider categories and their indexes can be rather problematic. It starts with the very choice of indicators and determining the ‘weight’ of each of them. An insufficient number of indicators can cause a loss of important aspects of the studied phenomenon, while an excessive number of indicators can blur the boundaries of its conceptual framework. What matters is the ‘right combination’, i.e. the selection of exactly the correct number of relevant indicators, which requires a great deal of prudence.

However, the selection of proper indicators, based on well-defined conceptual framework, does not suffice. What is also needed is reliability of ‘measurement’, i.e. the existence of such methods which enable that assessment of the situation as much as possible corresponds to the real state of things and that every change in the assessment – i.e. measurement – is the result of actual change in some key aspect of observed phenomenon, rather than a consequence of change in the research methodology. Thus, in the case when different research units are compared, it is necessary to use the same method and evaluation procedures. This cannot be taken for granted, but has to be carefully examined during the collection of data for secondary analysis. In qualitative research, it is important to carry out a careful selection of respondents whose opinions form the basis for the creation of estimates. Focusing on one specific target group of respondents can lead to favouring particular opinions, since the answers derive from specific social groups that through them express their interests. Due to this, results are not necessarily a reflection of the general situation. In our research, this was the case with World Competitiveness Yearbook – its data was used in sections on cognitive mobilisation, the quality of governance and entrepreneurial spirit – which a considerable part consists of information, gathered on the basis of interviews with managers. The same applies to the selection of experts for specific areas, especially those that come from the analysed environment. Here, too, their (non)objectivity can be the issue since these people are involved in the current social and political life or could be even the players who have their own political and ideological interests and preferences, which may lead to their (often unconscious, unreflected and unintentional) bias.

In addition, it is also important to have up-to-date information. In certain areas, the situation may be quite rapidly changeable, for example in the case when a long repressed problem erupts to the surface. In the Eastern European transformation, for example, while different authors were forecasting the breakdown of socialism on the basis of theoretically grounded and empirically backed research, starting already with analysis by von Mises (1922) and continuing for decades thereafter (e.g. Batra, 1978; Todd, 1976) but the actual events unfolded relatively quickly and unpredictably. The changes of attitudes or public opinion may also be triggered relatively
quickly by discrete events. Assessments that are based on older data (such data can also be ‘only’ a few years old) usually overlook such trends.

Finally, an assessment of the situation requires transparency, i.e. visibility and verifiability of criteria, methods, estimation and evaluation of procedures. When the criteria for the assessment of certain areas are not sufficiently specified, the estimates are not sufficiently grounded, and if it is not clear who the authors of the assessments are, we cannot talk about falsifiability of the ratings and as a result, subsequent verification and critical analysis of them is not possible. This is necessary for professional integrity and the credibility of comparative research and its findings. Lack of transparency prevents or at least reduces the possibility of various errors or even conscious manipulations, which may occur if there is no possibility of control in terms of the assessment of the evaluators themselves.

Fuzzy-set qualitative comparative analysis as a useful methodological tool

No research method can fully overcome all of the aforementioned issues of operationalisation and quality of data. However, fuzzy-set qualitative comparative analysis provides an interesting approach, which can, if applied properly, help us to overcome several dilemmas and obstacles related to comparative research.

The method was adjusted to the needs of social sciences by C. Ragin (2000, 2008), introducing logical analysis to comparative social research. As Norkus explains in more detail in this volume (Chapter 4), an earlier version of qualitative comparative analysis was a dichotomous crisp-set analysis. Based on the Boolean algebra, the method requires us to present our indicators in terms of memberships in particular sets: a country having a certain feature thus belongs to the corresponding set of this feature (e.g. to a set of politically stable countries), while a country without this feature does not belong to the set. (In conventional variable-oriented approach, one would understand sets as variables.) Since the features, in reality, are not just either present or absent – they are not crisp sets – but present to different extents, they should be described in terms of fuzzy set membership ranging from 1 (the full presence of a certain feature) to 0 (the full absence of a certain feature). A population of countries can thus be described in terms of different intensities of different set memberships – each set representing each of the indicators or variables.

Fuzzy-sets can be – indeed, they have to be – carefully tailored to fit theoretical concepts, and therefore provide a unique opportunity to engage in dialogue not only between theory and empirical evidence, as Ragin suggests (2000, 2008), but even encourages dialogue between different types of empirical evidence. In some cases we may have high-quality hard data at our disposal, which can be used to determine fuzzy-set membership by employing advanced statistical analysis. However, more often than not we do not have such data at disposal, either in cases when the statistics do not exist or when we are dealing with concepts that cannot easily and reliably be captured with statistics (e.g. the concept of civilizational competence in our heuristic model of socio-cultural factors of developmental performance). In such cases, we may resort to “anchoring” fuzzy-set membership. Anchoring is a process in which we assign a given set membership category to each case on the basis of insufficient hard data, on the basis of qualitative data, or a combination of both. We assign categories between 1 (the full presence of a certain feature) to 0 (the full absence of a certain feature). The number of categories (or anchors) may differ, though it should, in principle, be the same for all fuzzy sets included in a single analysis. This may imply only two categories, i.e. fully in the set...
(value 1) or fully out of the set (value 0) (i.e. not really a fuzzy but a crisp set), three categories (1 as fully in, 0.5 as partly in, partly out and 0 as fully out), four categories (1 as fully in, 0.67 as more in than out, 0.33 as more out than in and 0 as fully out), and so on. The set membership values cannot be assigned mechanically but based on the combination of the existing data and in-depth cognizance of specific phenomena.

Ragin developed two distinct analytical algorithms, the inclusion algorithm (see Ragin, 2000) and the truth table algorithm (see Ragin, 2008). We analysed data on socio-cultural factors of sustained development by application of then-available inclusion algorithm. This algorithm allowed us to analyse the impact of history (civilisational competence) on current and prospective factors of development. The results showed that history influences all factors of developmental performance, with one notable exception, the quality of governance. While this may look surprising, a look into our fuzzy-set database (Adam et al., 2005: 208) hinted at the reason. A number of countries in our sample (Ireland, Spain, Portugal, Estonia, Poland, Latvia, Lithuania) had higher fuzzy-set membership for the quality of governance than for civilisational competence. We hypothesised that this is due to membership (Ireland, Spain, Portugal) or accession (Estonia, Poland, Latvia, Lithuania) of these countries to the EU, a situation in which implementation of relatively strict and straightforward demands (e.g. the Copenhagen criteria) significantly improved indicators on the quality of governance. In the second step, we tested the impact of all socio-cultural factors on developmental performance. Also here our model proved robust, with one small twist: social cohesion did not impact developmental performance. While trying to explain this, the fuzzy-set analysis yet again revealed its analytical strength. Namely, we negated fuzzy-sets (social cohesion and developmental performance), effectively changing the meaning of both sets to its opposite. This procedure, which does not give us any results in classical statistical research, showed us that the absence of social cohesion is a necessary condition for poor developmental performance. However, it is not a sufficient one, implying that other adverse conditions have to be fulfilled as well.

When applying a truth table algorithm, the results of fuzzy sets analyses are interpreted in terms of consistency and coverage. Consistency is somewhat comparable – although far from identical – to statistical significance, implying that the null hypothesis cannot be rejected for the relationships with insufficient consistency. Only with a sufficient consistency, one should check the coverage of the relationship, i.e. to what extent is the effect explained by the cause. This is roughly comparable – but again not identical – to the correlation coefficients or, even more precisely, to R square values in classical statistical regression analyses.

This algorithm can also be usefully applied for the purpose of transnational comparative research on societal transformations. One such example is the analysis of differences of innovation performance between Eastern and Western European countries (Rončević & Cepoi, 2016). Here we analysed the impact of the three social forces, i.e. the institutions, social networks and cognitive frames on national innovation performance. We collected indicators from a variety of international comparative reports (e.g. World Competitiveness Yearbook, Global Competitiveness Report, Innovation Union Scoreboard etc.) and followed established protocols to develop fuzzy-sets. The analysis allowed us to identify interesting and detailed conclusions. For example, Table 3.1 shows us that institutions and social networks are necessary and sufficient conditions of national innovative performance. When it comes to cognitive frames, the situation is not so conclusive. While consistency for cognitive frames as sufficient conditions is high enough, the coverage is relatively poor, i.e. below 0.800. When analysing necessary conditions, the coverage is bigger, but the results are not consistent enough.

The results are even more interesting in the case of Eastern European countries. Table 3.2 clearly shows that the three social forces play absolutely no role in shaping the national innovation
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performance. Only cognitive frames exhibit high enough consistency when analysing necessary conditions, but even in this case the coverage is very low.

However, the analysis does not end here. Fuzzy-set is a logical analysis and allows us to negate our fuzzy-sets. Table 3.3 shows the analysis of negated fuzzy-sets, effectively analysing whether the absence of institutions, cognitive frames and social networks is a necessary and sufficient condition of poor innovation performance. In this case the results are very robust: all three social forces are both necessary and sufficient conditions of poor innovation performance.

To summarise, the results show that in the Western European countries the social forces (institutions and social fields) are shaping the social fields of innovations. However, in the East, this is not the case. Instead, it is the absence of these forces that is relevant in shaping the lacklustre innovativeness.

What are the key benefits of the method when used in comparative research?

First, it allows high levels of flexibility in terms of operationalisation and the measurement of different concepts. Within a single analytical model, they may range from fully quantifiable (such as the openness of a society in economic terms measured through foreign trade and foreign

| Table 3.1 Sufficient and necessary conditions for Western European countries |
|------------------------|------------------------|------------------------|
| **SUFFICIENT CONDITIONS** | **NECESSARY CONDITIONS** |
| Consistency | Coverage | Consistency | Coverage |
| Institutions | .981 | .800 | .800 | .981 |
| Cognitive frames | .855 | .615 | .615 | .855 |
| Social networks | .903 | .952 | .952 | .903 |

Source: Calculations by authors.

| Table 3.2 Sufficient and necessary conditions for Eastern European countries |
|------------------------|------------------------|------------------------|
| **SUFFICIENT CONDITIONS** | **NECESSARY CONDITIONS** |
| Consistency | Coverage | Consistency | Coverage |
| Institutions | .561 | .793 | .793 | .561 |
| Cognitive frames | .145 | .828 | .828 | .145 |
| Social networks | .184 | 1 | 1 | .184 |

Source: Calculations by authors.

| Table 3.3 Analysis of negated fuzzy-sets for Eastern European countries |
|------------------------|------------------------|------------------------|
| **SUFFICIENT CONDITIONS** | **NECESSARY CONDITIONS** |
| Consistency | Coverage | Consistency | Coverage |
| Institutions | .995 | .986 | .986 | .995 |
| Cognitive frames | .996 | .889 | .889 | .996 |
| Social networks | 1 | .889 | .889 | 1 |

Source: Calculations by authors.
direct investment stock) to purely qualitative concepts, such as – in our case – civilisational competence. As a result, our assessment of the situation can employ a rich variety of data, as is the case in comparative case studies.

Second, it may combine the best of the two worlds: the richness of data on individual cases typical for qualitative approaches, and the systematic and rigorous procedures enabling broader generalisations, typical for quantitative perspectives. On the one hand, the researcher can (and should) stay in touch with their individual cases, while also observing a broader picture. Compared to purely quantitative methods, the benefit provided by the fuzzy-set perspective lies in both its remaining focus on individual cases and their specifics in a comparative perspective (see Ragin, 2008). We are thus able to both observe and interpret individual cases (i.e. countries) as well as identify broader patterns.

Third, the method allows a direct and rich dialogue between theory and empirical observations, both in terms of assigning set memberships and analysing their causal inter-relations. It is thus extremely beneficial when one wants to link theory – particularly middle-range theory – with empirical reality.

Fourth, through the techniques of anchoring and calibration we are not only able to combine quantified data with qualitative assessments but we can also distinguish between more and less relevant differences between the cases. For instance, in purely quantitative terms, the GDP per capita of Luxemburg is more than twice the one of the United States but this sizeable difference is quite irrelevant since both countries clearly fully belong to a set of rich countries.

Fifth, unlike conventional statistics, fuzzy-set analysis allows us to distinguish between necessary and sufficient causal relationships and their combinations. We may thus also consider the situations when a given cause is necessary but not sufficient for a given effect or when a given cause is sufficient but not necessary for a given effect. In terms of sets, sufficiency implies that the cause is a subset of the effect, while necessity means that the cause is a superset of the effect. The cause is necessary and sufficient when both sets overlap fully. In addition, fuzzy-set can help us identify causal complexity in sometimes surprising ways. For example, while testing our heuristic model described earlier, we have been able to confirm that all socio-cultural factors included in the model, except the social cohesion, were necessary and sufficient for developmental performance. However, when we negated fuzzy-sets of social cohesion and developmental performance, the results showed that poor social cohesion is a necessary condition for poor developmental performance. However, it is not a sufficient one, with the implication that other adverse conditions have to be present as well. (Adam et al., 2005: 210–211).

Finally, fuzzy-set analysis is ideal for the situations when the number of cases is too high for labour-intensive in-depth qualitative case studies – especially those requiring extensive fieldwork – as a basis for comparative analysis but still too low for the application of most of the classical statistical methods (except a few, such as hierarchical cluster analysis, which, however, normally cannot be used for testing causal relationships). Comparative analyses of post-communist countries are very likely to be characterised by this middle population size, since we are usually dealing with a population of between 10 and 20 countries (e.g. Adam et al., 2005; Rončević & Cepoi, 2016).

**Conclusion: context-specific methodology for specific contexts**

The methodological approach that we presented in this chapter may be seen as one of the attempts to overcome some of the either-or dilemmas – in terms of searching for broad patterns without losing sight of the specific cases, combining quantitative and qualitative data,
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emphasising interdependences between different life orders or subsystems and linking a variety of theoretical approaches with each other and with the empirical data.

We are not implying that fuzzy set analysis is a universal cure for all of the problems of systematic comparative analysis. One should also be aware of some clear limitations. First, the method can only be applied when we are very familiar with the cases and the data, otherwise we may establish wrong anchors and wrong calibrations, making the analysis partly or completely flawed. Second, the close relationship between the theoretical and empirical aspects has its clear downside as well. The method can only be applied when we have certain theoretical backgrounds and hardly on a purely inductive basis. We should be aware of its primarily confirmatory (not exploratory) character. Third, it cannot be used for too many causes (i.e. sets representing independent conditions) in a single model – when compared to the number of cases. The analysis implies the formation of truth tables including different combinations of present and absent causes and effects. Too many combinations in the truth tables cells with 0 cases will not enable proper generalisations. Finally, it is not possible to use it with the large-N samples without a significant trade-off, with the price of losing contact with individual cases, which may impede the proper anchoring and interpretation of results. Nevertheless, some authors explore its potential in the analysis of large-N samples (Greckhamer et al., 2013) both as an alternative and as a complement to conventional regression analyses.

There is no one best approach for comparative research on East European transformations. The selection of a specific method will depend on the scope of research and also on the research goals. We will continue to see a large number of comparative case studies, which will employ time-consuming and labour-intensive qualitative comparative research, but which will be very rewarding in terms of knowledge about context-specific mechanisms and factors. We will also continue to see a number of large-N studies, which will rely on advanced statistical analyses, a trend that will continue to be enhanced by increasing the availability of harmonised data. However, the biggest change in comparative research on transformations will be the increasing number of fuzzy-set qualitative comparative research.

Note

1 Calibration is a process in which a researcher sets the basic rules to determine the fuzzy-set memberships. It is a process that has to involve substantive and theoretical knowledge and should not be done routinely, but with great care and attention to the specifics of all cases, therefore requiring dialogue between theoretical concepts and empirical evidence. At the end of this procedure, the researcher should check whether fuzzy-set memberships make sense – individually – again, for all cases included in the analysis.

Bibliography


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