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Research paper

Analyzing the Relationships Between Business Conditions and Happiness in OECD Countries: Application of the fsQCA Method

Young-Chool Choi

Department of Public Administration, Chungbuk National University
**Corresponding author E-mail: ycchoi@cbu.ac.kr*

Abstract

This paper aims to identify the configurations of business conditions affecting happiness in 35 OECD member countries, using as a basis the assumption that happiness at the national level can be affected by the conditions for business activities, which can be defined as the conditions under which workers carry out their business to make a living. To achieve the research goal, the paper employs Fuzzy-set Qualitative Comparative Analysis (fsQCA) as a research methodology. This research method has rarely been used in the analysis of happiness conditions. For this analysis, five independent variables and one dependent variable are used. The countries analysed are 35 OECD member countries. The results show that four configurations of business conditions affect happiness at the national level in these countries. This implies that each country whose happiness level is relatively low needs to benchmark that of the four configurations which it considers relates most closely to or has featured in common with, its own business conditions. In other words, because there are plural options for producing happiness in countries at the national level, each country with low levels in terms of happiness can benchmark or follow countries with this same configuration, leading to high levels of happiness.

Keywords: *fsQCA, configurations of happiness conditions, Qualitative Comparative Analysis.*

1. Introduction

Many factors affecting happiness operate at community level, not at central level. For example, levels of employment, access to education, and quality of environment vary by community. Differences between communities within a country are as important as differences between countries [22]. Recently, there has been a consensus that macro-economic statistics on well-being at national level do not reflect the genuine well-being of people and their aspirations. Accordingly, it is said that there is need for evidence enabling us to explain people's well-being in a variety of areas. From this point of view, in order for us to show the full picture of people's well-being, we need to explain how people think of the community in which they live, how they respond when the community does not meet their needs, and whether access to services influences people's choices of community to live in. In this regard, we can say that investigating community well-being can contribute toward discovering problems hidden behind well-being at national level. An overview of well-being at community level helps communities with low levels of well-being benchmark other communities with high levels of well-being within a country or in other countries. Furthermore, indicators of community well-being help policymakers and academics evaluate the extent to which community achievements and performances affect national prosperity and diverse social challenges. Understanding well-being in communities where people live and comprehending what factors determine levels of community well-being matters to community policymaking and design at both central and local level, because policymakers can thereby identify which elements are poor in communities with low levels of well-being and what should be done to strengthen them.

Happiness is unquestionably one of the most crucial issues in our daily and social life, and so the ultimate goal of the government of every country is to elevate the happiness levels of its citizens and, at the same time, to enhance national development. In achieving these two objectives, business organizations, in particular, have a crucial role to play. The business provides goods and services for human needs. Business conditions which affect business activities at national level influence both national development and the happiness of citizens. It is assumed here that the degree to which happiness levels may be affected by the business may be different in different OECD member countries[4][14][21]. It is crucial for policymakers in OECD member counties to understand that citizens' happiness levels may be affected by different combinations of business determinants. Against this background, this paper attempts to discover the configurations of business determinants associated with happiness, and to suggest the policy implications for each country.

2. Literature Review

Discussions of happiness from a philosophical point of view were initiated by Bentham [16]. Since then, many studies have been conducted on happiness, and perspectives on it vary from discipline to discipline. In addition, many terms similar to and interconnected with

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'happiness' have been created, including 'well-being', 'life satisfaction' and 'quality of life'. The focus in this paper is on happiness. From a psychological point of view, happiness may be defined as an individual's subjective emotions regarding his or her life [10], whereas from a sociological point of view it is seen as being determined by objective rather than subjective conditions [18]. Likewise, happiness is sometimes emphasized by subjective conditions and sometimes by objective ones. At any rate, happiness is one of the ultimate goals which most people pursue to achieve, and represents a positive judgement on one's life. Therefore, a person's quality of life depends on how happy they are [2]. Happiness can be defined in different ways, but in general, it may be defined as the degree to which a person evaluates the overall quality of his or her present life positively and likes the life he or she leads[5][31]. Similarly, happiness can also be defined as an emotion ranging from satisfaction to great joy [29]. Since happiness has been defined in so many different ways, however, it is difficult to ascertain how it is defined in any one specific country. Even so, we can say that all countries' understandings of it have something in common. Here, on the basis of Veenhoven's definition of happiness, we define it as the degree to which a person evaluates the overall quality of his present life positively [8].

What are the determinants that affect happiness? These have been discussed at different levels, including the micro, the middle-range, and the macro level. Dolan et al. (2008) summarized the determinants of happiness after examining 153 papers published in economics and psychology journals [2][5][6][10]. They include: relative income; personal characteristics (age, gender, ethnicity, personality); socially developed characteristics (education, health, type of work, unemployment); how people spend their time(hours worked, commuting, caring for others, community involvement and volunteering, exercise, religious activities); attitudes and beliefs regarding self, others, and life in general (attitude towards circumstances, trust, political persuasion, religion); relationships (marriage and intimate relationships, having children, seeing family and friends); and the wider economic, social and political environment (income inequality, unemployment rates, inflation, the welfare system and public insurance, degree of democracy, climate and the natural environment, safety and deprivation in the area, urbanization). In addition, some research[9][16] has suggested determinants which may affect happiness at the individual level. Turning to studies on happiness at the middle-range level, we can observe that these mainly address happiness issues relating to firms or cities within a country. They include studies by Michalos and Zumbo (1999), Coggbum and Schneider(2003), Choi (2014) and OECD (2015). In these studies, the unit of analysis is not the individual but the city or firm, and they deal with the determinants affecting the happiness of local community residents or enterprise employees, meaning that they can be called middle-range studies. In addition, there are studies on happiness which deal with its determinants at a national level. These include the World Happiness Report and the Happy Planet Index. These studies analyse the determinants associated with happiness at the national level, comparing the happiness scores of different countries.

Generally speaking, previous studies on happiness determinants have been conducted at either the macro or the individual level. In addition, most of the studies [11][18][20][23] conducted at national level have mainly employed quantitative research methods such as regression analysis or the structural equation model, and so they have not uncovered qualitative differences between countries or produced critical information useful to each individual country. That is to say since the majority of this research work has relied on quantitative methods in order to reveal a few significant items of statistical information which can be commonly applied to a number of different countries, specific configurations of happiness determinant combinations have not been discovered. Moreover, few research works have addressed the relationships between happiness and business determinants at a national level. Without understanding these, however, it is difficult to ascertain the strategies by which happiness at a national level might be enhanced through the supporting and strengthening of business activities. Against this background, this research raises the following research question:

What configurations of business determinants affect happiness at a national level in OECD member countries?

3. Research Design

3.1. Methodology

In this analysis, fuzzy-set Qualitative Comparative Analysis (fsQCA) was employed. One apparent limitation of the truth table approach is that it is designed for conditions that are simple presence/absence dichotomies (i.e., Boolean or "crisp" sets) or multichotomies (mvQCA). Many of the conditions that interest social scientists, however, vary by level or degree. For example, while it is clear that some countries are democracies and some are not, there is a broad range of in-between cases. These countries are not fully in the set of democracies, nor are they fully excluded from this set

Fortunately, there is a well-developed mathematical system for addressing partial membership in sets, fuzzy-set[17][36]. Fuzzy sets are especially powerful because they allow researchers to calibrate partial membership in sets using values in the interval between 0 (nonmembership) and 1 (full membership) without abandoning core set theoretic principles such as, for example, the subset relation. As Ragin (2000) demonstrates, the subset relation is central to the analysis of causal complexity. Vink and Van Vliet (2009) describes fsQCA f as a 'family of comparative techniques that aim to explain macro social phenomena in a parsimonious way while working with small-to medium size data sets. While fsQCA does not produce statistical results for broad generalization, it is most valuable in generating deep levels of introspection and insight, a goal worthy of difficult questions.

Fuzzy-set QCA is a research method in which a case for analysis is perceived in terms of combinations of a set of diverse properties and the case is approached from a holistic perspective[24][25]. It is basically a comparative research technique[3][7][12] that is used to explain large social events concisely by using a small number of cases (5–55), on the basis of the fuzzy scores changed from the raw data. Using combinations of the conditions affecting a dependent variable, we can discover the sufficient and necessary conditions underlying a dependent variable. In addition, unlike other quantitative methods such as regression analysis, fsQCA can make a quantitative and qualitative analysis of social issues possible using a relatively small number of cases.

In order to transform conventional variables into fuzzy variables, it is necessary to calibrate them, so that the variables match or conform to external standards. Most social scientists are content to use uncalibrated measures, which simply show the positions of cases relative to each other. Uncalibrated measures, however, are clearly inferior to calibrated measures. For example, with an uncalibrated measure of democracy it is possible to know that one country is more democratic than another or more democratic than average, but still not know if it is more a democracy or an autocracy. Fussy sets are calibrated using theoretical and substantive criteria external to the data, and take into account the researcher's conceptualization, definition, and labelling of the set in question. The end product is the fine-grained calibration of the degree of membership of cases in sets, with scores ranging from 0.0 to 1.0.

The research must specify the values of an interval-scale variable that correspondent to three Qualitative breakpoints that structure a fuzzy set: the threshold for full membership (fuzzy score=0.95), the threshold for full nonmembership (fuzzy score=0.05), and the cross-

over point (fuzzy score=0.5). These three benchmarks are used to transform the original ratio or interval-scale values into fuzzy membership scores, using transformations based on the log odds of full membership.
fsQCA needs thresholds to transform scale data to stepped variable suitable for MVQCA (Multiple Variable QCA). To do this, it uses Tosmana (Tool for Small-n-Analysis). Tosmana implements classical Boolean algebra, but it seeks to tackle one of the main limitations of QCA (Qualitative Comparative Analysis) –its restriction to Boolean sets: every element of a data set has to be T (true) or F (false), but often we want to use more condition values like {low, medium, high}. Therefore Tosmana introduces Multi-Value Minimization as an additional feature of Boolean Minimization, but it also can be used for Boolean Minimization. Tosmana provides two ways to do so: thresholds can be set directly by hand or thresholds can be set interactively by using the 'Thresholds setter'. Here in this study, we use 'Thresholds setter' function to create thresholds.

3.2. Variables

This research attempts to discover the configurations of business determinants that affect happiness at a national level in OECD countries. If happiness is analysed at the level of the individual firm, then the leadership provided by the employer, the income levels of the employees, working conditions, etc., may be important. However, because this study focuses mainly on identifying how happiness in OECD countries is related to business determinants at a national level, a number of different variables are included in the analysis, following researches of Black et al. (2011) and Kim et al. (2015). These variables consist of one dependent variable (happiness) and five independent variables (Table 1:GDP per capita, hours worked per annum, hiring and firing practices, labour–employer cooperation, and Gini coefficient). These data are collected at a national level.

Table 1: Variables and data source

Variable	Acronym	Explanation	Measurement	Source
Happiness	Happiness	The degree to which a person evaluates the overall quality of his present life positively.	The average ladder score (the average answer to the Cantril ladder question, which asks people to evaluate the quality of their present lives on a scale of 0–10 for Each country, averaged over the years2014–16.	Helliwell, Layard and Sachs, World Happiness Report 2017[13]
GDP per capita	GDP capita	GDP per capita.	GDP per capita	Global Competitiveness Report 2016–2017[34]
Hours worked	Work hour	Hours worked per annum.	Hours worked per annum.	International Labour Organization[15]
Hiring and firing practices	Hiring	The extent to which regulations allow for the flexible hiring and firing of workers.	In your country, to what extent do regulations allow for the flexible hiring and firing of workers? [1 = not at all; 7 = to a great extent.]	Global Competitiveness Report2017–2018[35]
Cooperation between worker and employer	Cooperation	Labour–employer cooperation.	In your country, how do you characterize labour–employer relations? [1 = generally confrontational; 7 = generally cooperative.]	Global Competitiveness Report2017–2018[35]
Gini coefficient	Gini	Global Gini Index (distribution of family income).	The index is calculated from the Lorenz curve, in which cumulative family income is plotted against the number of families, ranged from the poorest to the richest.	International Labour Organization[15]

3.3. Countries to be analysed

Thirty-five OECD member countries are analysed. They are Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Japan, Korea, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovania, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. It is true to say that happiness scores for each country, along with its ranking, may vary by publishing institute and researcher(s), because they may employ different methods and criteria. However, the World Happiness Report, which is published by the sponsoring body of the UN, covers many of the countries to be analysed in this research, so we have used its data. In the case of World Happiness Report 2017, the overall rankings of country happiness are based on the pooled results from Gallup World Poll surveys from 2015-2017, and show both change and stability. There is a new top ranking country, Finland, but the top ten positions are held by the same countries as in the last two years, although with some swapping of places. Four different countries have held the top spot in the four most recent reports- Denmark, Switzerland, Norway and now Finland.

4. Analysis

4.1. Descriptive statistics

Descriptive statistics for the 35 OECD countries are presented in Table 2. As shown in Table 2 below, the mean score of happiness is 6.63, its minimum value is 5.36, and its maximum value is 7.63. The mean score, minimum value and maximum value of other variables are also described in Table 2.

Table 2: Descriptive statistics for the dependent variables of OECD countries

Variable	Case number	Minimum value	Maximum value	Mean	S.D.
happiness	35	5.36	7.63	6.63	0.706
Work hour	35	1363	2255	1732.9	200.141
hiring	35	2.40	5.60	3.81	0.878
cooperation	35	3.50	6.20	4.94	0.738
GDP capita	35	9710	93530	38640	
Gini	35	0.25	0.46	0.31	0.052

4.2. Analysis results

4.2.1. Data for variables

Table 3 presents the raw data for the six variables in the OECD countries. Finland records the highest happiness score (7.632) and Greece the lowest (5.358). In terms of work hours, Mexico ranks highest, at 2,255 hours per annum, and Germany lowest, at 1,363 hours. In terms of GDP per capita, Norway ranks highest at 93,530 USD and Mexico lowest at 9,710 USD. As regards hiring and firing practices, Switzerland ranks highest at 5.6, and Slovenia lowest at 2.4. In terms of cooperation between labour and management, Switzerland ranks highest at 6.2 and South Korea lowest at 3.5. And in terms of Gini coefficient, Mexico ranks highest at 0.46, implying that income inequality is worst in OECD countries, whereas three countries – Iceland, Slovenia and Slovakia –rank joint-lowest at 0.25, indicating these they are the least-bad countries in terms of income inequality.

Table 3: Raw data for the six variables in OECD countries (Unit: scores)

Country	Cooperation	Hiring	GDP capita(US Dollars)	Gini	Work hour	Happiness
Australia	4.3	3.2	60050	0.34	1669	7.272
Austria	5.6	3	47260	0.28	1601	7.139
Belgium	4.7	3.2	44510	0.27	1551	6.927
Canada	5.4	4.9	47250	0.32	1703	7.328
Chile	4.4	3	14100	0.45	1974	6.476
Czech Republic	4.8	3.	18150	0.26	177	6.711
Denmark	6	5.2	60270	0.26	1410	7.555
Estonia	5.2	4.6	18320	0.33	1855	5.739
Finland	5.2	3.5	46560	0.26	1653	7.632
France	3.9	2.4	40710	0.3	1472	6.489
Germany	5.3	4.6	45790	0.29	1363	6.965
Greece	4	3.5	20270	0.34	2035	5.358
Hungary	4.3	4.5	12970	0.29	1761	5.62
Iceland	5.6	5.4	50110	0.25	1883	7.495
Ireland	5.1	4.1	52550	0.3	1879	6.977
Israel	5.2	4.5	35770	0.35	1889	6.977
Italy	4	2.8	32830	0.33	1730	6
Japan	5.7	3.2	38840	0.33	1713	5.915
Latvia	4.6	3.5	14990	0.35	1910	5.933
Luxembourg	5.6	3.7	77480	0.28	1512	6.91
Mexico	4.4	3.4	9710	0.46	2255	6.488
Netherlands	5.9	4.2	48850	0.3	1430	7.441
New Zealand	5.8	4.6	40020	0.35	1752	7.324
Norway	6.1	3.4	93530	0.27	1424	7.594
Poland	4.3	3.4	13310	0.29	1928	6.123
Portugal	4.6	3.1	20470	0.34	1842	5.41
Slovakia	4.3	3.1	17570	0.25	1740	6.173
Slovenia	4.4	2.4	22250	0.25	1682	5.948
South Korea	3.5	3.5	27450	0.3	2069	5.875
Spain	4.3	3.2	28380	0.35	1695	6.31
Sweden	5.7	3.5	57900	0.28	1621	7.314
Switzerland	6.2	5.6	84550	0.3	1590	7.487
Turkey	3.8	3.5	9950	0.4	1832	5.483
United Kingdom	5.3	5.1	43700	0.36	1676	6.814
United States	5.4	5.4	55980	0.39	1783	6.886

Source: constructed by the author on the basis of the 2017-2018 Global Competitiveness Report and ILO database

4.2.2. Conversion from raw data to fuzzy set scores

The next step is to switch each variable's value into a fuzzy set score, using thresholds. There are two ways of doing this. In this study, we utilize the calibration function of fsQCA software to create fuzzy set scores. What matters is objectively deciding upon the thresholds producing each variable's fuzzy scores. In reality, it is difficult to find objective thresholds for dividing each variable into more than two. For this reason, some studies use the mean score of a variable or its median; however, these statistics are arguable when it comes to thresholds. Therefore, this study relies on the Tosmana (Tool for Small-N Analysis) program for producing thresholds for each variable. This program produces thresholds of variables using their descriptive statistics, including their minimum and maximum values. Using the thresholds produced by the Tosmana program, the fsQCA software produces fuzzy set scores for each variable.
Fig. 1 shows that the thresholds for the variable 'happiness' are 5.93, 6.49 and 7.06, which are different from its median score of 6.814. The thresholds for each variable are produced in the same way as for the variable 'happiness'. As indicated earlier, happiness score of each country are extracted from the World Happiness Report which is a landmark survey of the state of global happiness. The World Happiness Report 2017, ranks 156 countries by their happiness levels, and 117 countries by the happiness of their immigrants

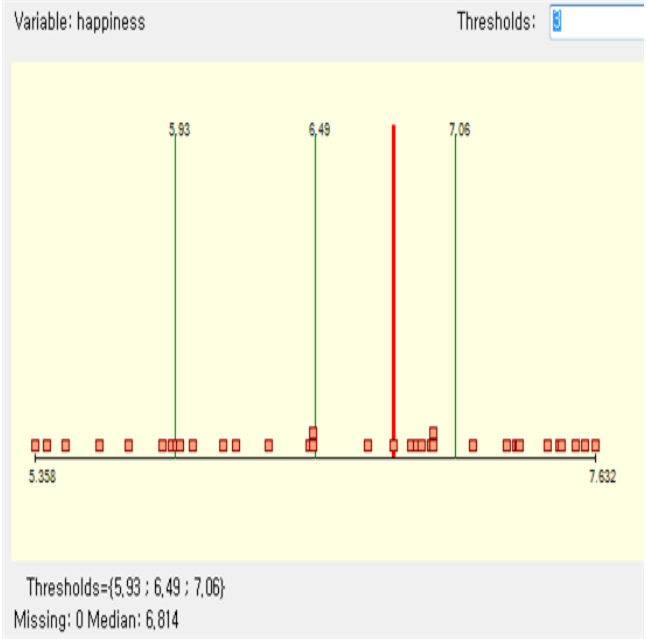

Fig. 1: Thresholds of the variable 'happiness' in OECD countries

Fig. 2 shows that the variable, 'cooperation' which means the degree to which labour and management has a good relationship in the business field, has three thresholds 4.18, 4.85 and 5.52. It characterizes whether the relationship between labour and management is generally confrontational (score 1) or generally cooperative (score 7). It is based on the assumption that cooperation in labour-employer relations can lead to the more business-friendly environment.

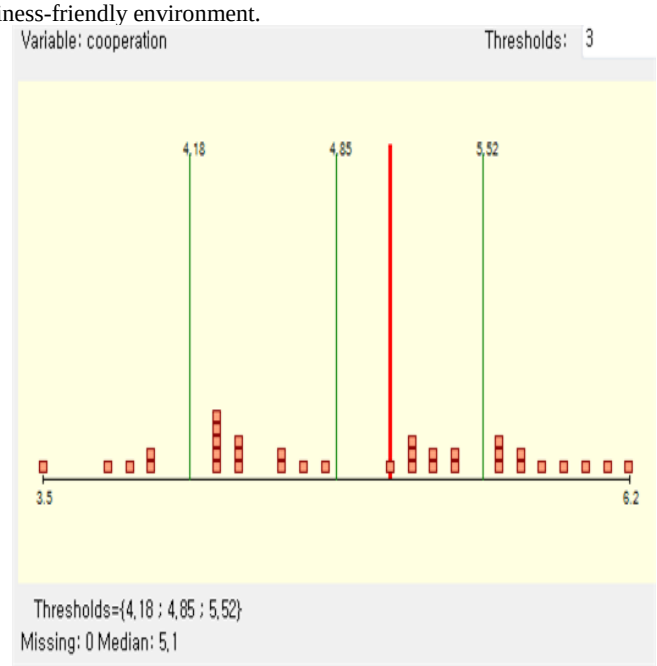

Fig. 2: Thresholds of the variable 'cooperation' in OECD countries

Fig. 3 shows that the variable, 'hiring' which indicates the extent to which regulations allow for the flexible hiring and firing of workers, has the three thresholds 3.2, 4 and 4.8. The variable is related to hiring and firing practices, and is measured by a question like,' in your

country to what extent do regulations allow flexible hiring and firing of workers?' (1- not at all; 7= to a great extent). This variable is also linked to whether each country has the business-friendly environment or not.

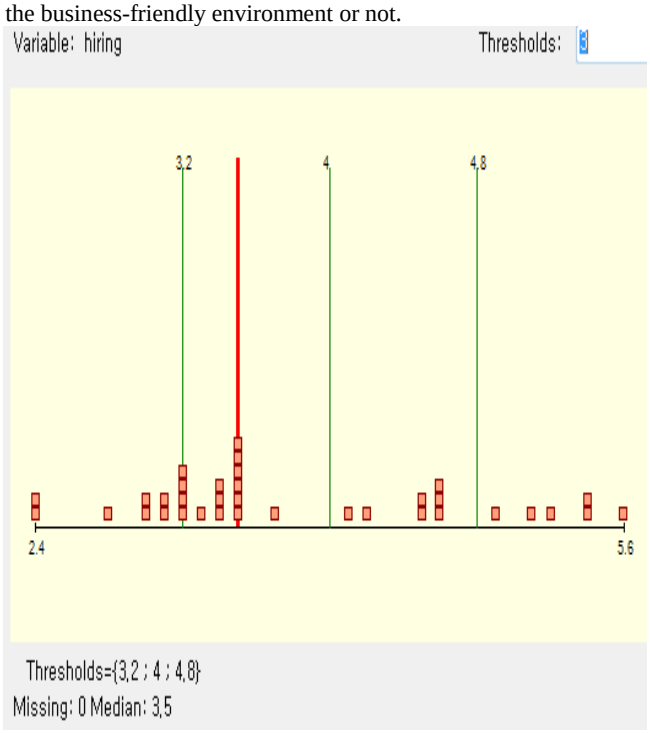

Fig. 3: Thresholds of the variable 'hiring' in OECD countries

Fig. 4 above shows that the thresholds of the variable 'gdpcapita' which means GDP per capita are 30665, 51620 and 72575.

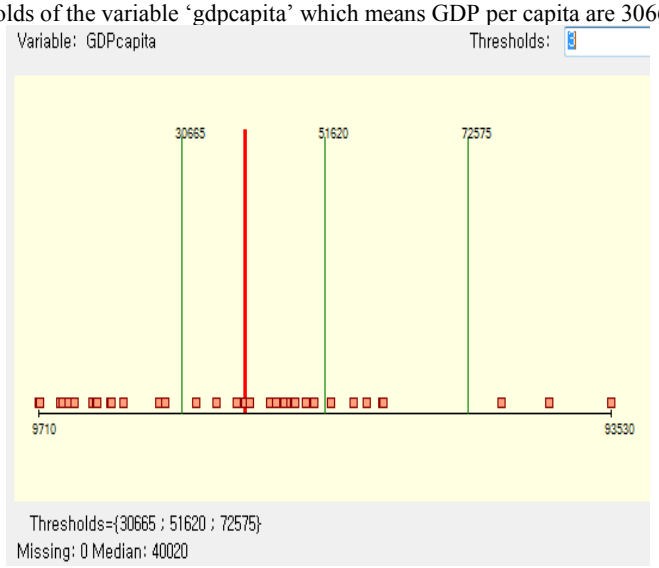

Fig. 4: Thresholds of the variable 'GDPcapita' in OECD countries

Fig. 5 shows that the variable 'Gini' which represents a measure of statistical dispersion intended to represent the income or wealth distribution of a nation's residents, and is the most commonly used measurement of inequality, has the three thresholds 0.3, 0.36 and 0.41. The Gini coefficient measures the inequality among values of a frequency distribution (for example, levels of income). A Gini coefficient of zero expresses perfect equality, where all values are the same (for example, where everyone has the same income). A Gini coefficient of 1 (or 100%) expresses maximal inequality among values (e.g., for a large number of people, where only one person has all the income or consumption, and all others have none, the Gini coefficient will be very nearly one).

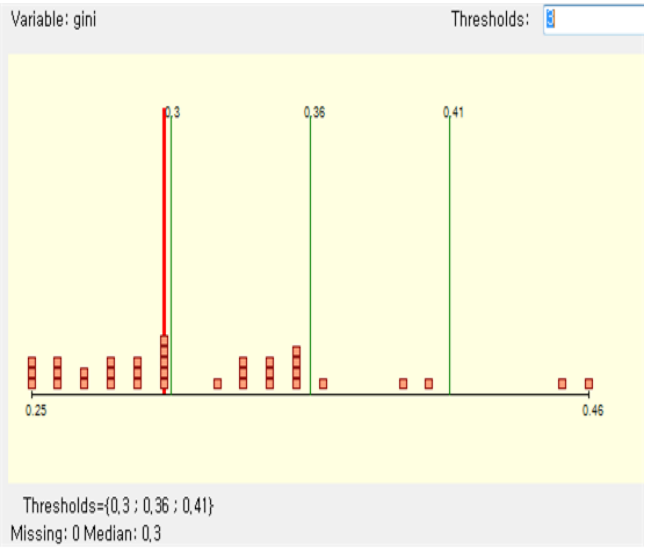

Fig. 5: Thresholds of the variable 'Gini' in OECD countries

Fig. 6 shows that the variable 'workhour' representing hours worked per annum has the thresholds 1586, 1809 and 2032.

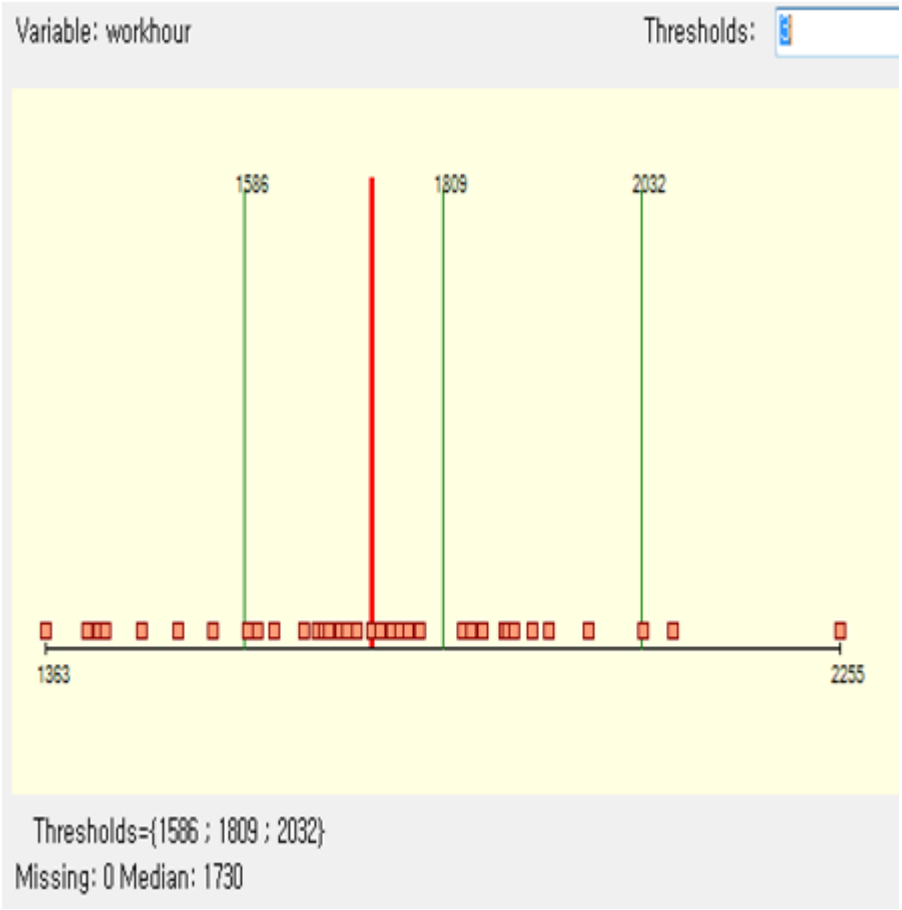

Fig. 6: Thresholds of the variable 'Work hour' in OECD countries

Table 4 shows the fuzzy set scores of the five independent variables and the one dependent variable. Fuzzy membership scores address the varying degree to which different cases. Belong to a set (including the two qualitative states, full membership and full non-membership), not how cases rank relative to each other on a dimension of open-ended variation. Thus, fuzzy sets pinpoint qualitative states while at the same time assessing varying degrees of membership between full inclusion and full exclusion. In this sense, a fuzzy set can be seen as a continuous variable that has been purposefully calibrated to indicate degree of membership in a well-defined set. Such calibration is possible only through the use of theoretical and substantive knowledge, which is essential to the specification of the three qualitative breakpoints: full membership (1), full nonmembership (0), and the cross-over point, where there is maximum ambiguity re-garding whether a case is more "in" or more "out" of a set (.5).

Table 4: Fuzzy set scores of variables switched from raw data

Country	Fs Cooperation	Fs Hiring	Fs GDP Capita	Fs Work Hour	Fs Gini	Fs Happiness
Australia	0.08	0.05	0.77	0.13	0.73	0.98
Austria	0.97	0.02	0.35	0.06	0.98	0.97
Belgium	0.34	0.05	0.27	0.03	0.99	0.91
Canada	0.92	0.97	0.35	0.19	0.88	0.99
Chile	0.12	0.02	0	0.9	0	0.48
Czech Republic	0.44	0.07	0.01	0.37	0.99	0.76
Denmark	0.99	0.99	0.78	0	0.99	1
Estonia	0.83	0.9	0.01	0.65	0.82	0.02
Finland	0.83	0.13	0.33	0.11	0.99	1
France	0.01	0	0.17	0.01	0.95	0.5
Germany	0.88	0.9	0.3	0	0.97	0.92
Greece	0.02	0.13	0.01	0.95	0.73	0
Hungary	0.08	0.87	0	0.34	0.97	0.01
Iceland	0.97	0.99	0.45	0.73	1	0.99
Ireland	0.75	0.59	0.53	0.72	0.95	0.93
Israel	0.83	0.87	0.09	0.75	0.62	0.93
Italy	0.02	0.01	0.06	0.26	0.82	0.07
Japan	0.98	0.05	0.14	0.22	0.82	0.04
Latvia	0.25	0.13	0.01	0.8	0.62	0.05
Luxembourg	0.97	0.25	0.98	0.02	0.98	0.9
Mexico	0.12	0.1	0	1	0	0.5
Netherlands	0.99	0.68	0.4	0.01	0.95	0.99
New Zealand	0.99	0.9	0.16	0.32	0.62	0.99
Norway	1	0.1	1	0.01	0.99	1
Poland	0.08	0.1	0	0.83	0.97	0.12
Portugal	0.25	0.03	0.01	0.61	0.73	0
Slovakia	0.08	0.03	0.01	0.28	1	0.15
Slovenia	0.12	0	0.01	0.15	1	0.05
South Korea	0	0.13	0.03	0.97	0.95	0.04
Spain	0.08	0.05	0.03	0.18	0.62	0.28
Sweden	0.98	0.13	0.71	0.07	0.98	0.99
Switzerland	1	1	0.99	0.05	0.95	0.99
Turkey	0.01	0.13	0	0.58	0.08	0
United Kingdom	0.88	0.98	0.24	0.14	0.5	0.85
United States	0.92	0.99	0.65	0.41	0.14	0.89

Note. The value of each variable is switched from its original raw data to its fuzzy set score, and fs is added to the name of the original variable after the fuzzy set scores are calculated.

4.2.3. Truth table analysis

A truth table is a mathematical table used to determine if a compound statement is true or false. In a truth table, each statement is typically represented by a letter or variable, like p, q, or r, and each statement also has its own corresponding column in the truth table that lists all of the possible truth values. Table 5 presents the data regarding the combinations of causal conditions affecting the dependent variable, happiness, on the basis of the truth table analysis. The truth table will have 2^k rows (where k represents the number of causal conditions), reflecting all possible combinations of causal conditions. The 1s and 0s indicate the different corners of the vector space defined by the fuzzy set causal conditions. For each row, a value for each of the following variables is created.

Table 5: Results of truth table analysis

Fs Gini	Fs Work Hour	Fs GDP Capita	Fs Hiring	Fs Cooperation	Number	Fs Happiness	Raw Consist.	PRI Consist.	SYM Consist
1	0	1	1	1	2	1	0.993802	0.992481	0.992481
1	0	1	0	0	1	1	0.990783	0.985075	0.985075
1	1	1	1	1	1	1	0.986486	0.980769	0.980769
0	0	1	1	1	1	1	0.982036	0.970874	0.970874
1	0	1	0	1	3	1	0.974082	0.969543	0.969543
1	0	0	1	1	4	1	0.900901	0.878854	0.878855
1	1	0	1	1	3	0	0.785353	0.722222	0.722222
1	0	0	0	1	3	0	0.739212	0.668258	0.668258
1	0	0	1	0	1	0	0.6	0.361963	0.361963
1	0	0	0	0	7	0	0.495833	0.301923	0.322382
0	1	0	0	0	3	0	0.435484	0.078947	0.109375

It is generally accepted [30] that fsQCA data is presented in several graphical, numerical and tabulated forms. This maximizes the transparency of findings, demonstrates the logical minimization [26] of possible outcomes and identifies equi-finality. A truth table enables the reader to identify at a glance the alternative outcomes that may be possible and to verify how the researcher has dealt with minimization. It is essential to consider that the results presented in this paper are illustrative only and need to be defined in a broader report. Rather than being a limitation of fsQCA, consideration of alternative causal pathways is appropriate for the complexity of business happiness.

In the table above, *number* means a number of cases with greater than 0.5 a membership in that corner of the vector space. *Row consistency* means the degree to which membership in that corner of the vector space is a consistent subset of membership in the outcome. Here, we need to begin by developing a rule for classifying some configurations (vector spaces corners) as relevant and others as irrelevant, based on the number of cases residing in each sector of the vector space defined by the causal conditions. This is accomplished by

selecting a frequency threshold based on the number of cases with greater than 0.5 a membership in each configuration, as shown in the number column. When the total N (number of cases) is relatively small, the frequency threshold should be 1 or 2. When the total N is large, a more substantial threshold should be used. It is important to examine the distribution of cases across conditions, to identify the most populated sectors of the vector space. In general, the configurations selected should capture at least 75-90% of the cases[28]. Therefore, here in this study, we select 1 as frequency threshold. The configurations of the conditions affecting the dependent variable, happiness, in OECD countries are explained below. In a fuzzy-set analysis both the outcome and the causal conditions are represented using fuzzy sets. Fig. 7 below shows a simple data matrix containing fuzzy membership scores.

Algorithm : Quine-Mckluskey
True : 1

------ TRUTH TABLE SOLUTION-----

Frequency cutoff : 1.000000
Consistency cutoff : 0.900901
Assumptions:

	raw coverage	unique coverage	consistency
fsgini-1*⌣fsworkhour*fsgdpcapita*⌣fshiring	0.265648	0.175949	0.978221
fsgini-1*⌣fsworkhour*fshiring*fscooperation	0.367669	0.130606	0.931336
⌣fsworkhour*fsgdpcapita*fshiring*fscooperation	0.259241	0.022178	0.994329
fsgini-1*fsgdpcapita*fshiring*fscooperation	0.258255	0.021193	0.994307

Solution coverage : 0.586989
Solution consistency : 0.949004

Cases with greater than 0.5 membership in term
fsgini-1*⌣fsworkhour*fsgdpcapita*⌣fshiring :
Norway(0.9 , 1)
Luxembourg (0.75, 0.9)
Australia (0.73, 0.98)
Sweden (0.71, 0.99)

Cases with greater than 0.5 membership in term
fsgini-1*⌣fsworkhour*fshiring*fscooperation
Denmark (0.99, 1)
Switzerland (0.95, 0.99)
Germany (0.88, 0.92)
Canada (0.81, 0.99)

Cases with greater than 0.5 membership in term
⌣fsworkhour*fsgdpcapita*fshiring*fscooperation
Switzerland (0.95, 0.99)
Denmark (0.78, 1)
United States (0.59, 0.89)

Cases with greater than 0.5 membership in term
fsgini-1*fsgdpcapita*fshiring*fscooperation
Switzerland (0.95, 0.99)
Denmark (0.78, 1)
Ireland (0.53, 0.93)

Fig. 7: Configurations of conditions affecting the dependent variable, happiness, in OECD countries

The output includes measures of coverage and consistency for each solution term and for the solution as a whole. Consistency measures the degree to which membership in each solution term is a subset of the outcome. Consistency is computed by first computing the consistency of each case. For any solution term, a case is consistent if membership in the solution term is less than or equal to membership in the outcome. If a cases' a membership in the solution term I greater than its membership in the outcome (i.e., it is inconsistent), then the case is given a score that equals its membership in the outcome. These scores are then summed and divided by the sum of memberships in the solution term.

Solution consistency measures the degree to which membership is the solution (the set of solution terms) is a subset of membership in the outcome. The maximum of each case's membership across solution terms. If a membership in the solution is less than or equal to membership in the outcome, then the case is given a score that equals its membership in the solution term. If a membership in the solution term is greater than membership in the outcome (ie. if it is inconsistent), then the case is given the outcome scores (the lower of the two scores). These scores are summed and then divided by the sum of memberships in the solution term.

Solution coverage measures the proportion of memberships in the outcome that is explained by the complete solution. The consistent membership scores are summed across cases and then divided by the sum of the membership in the outcome.

Row coverage measures the proportion of memberships in the outcome explained by each term of the solution. Raw coverage is computed for each solution term from the original data by dividing the sum of consistent membership in the solution term by the sum of membership in the outcome.

Unique coverage measures the proportion of memberships in the outcome explained solely by each individual .solution term (memberships that are not covered by other solution terms). This is computed by first removing the term from the solution and computing solution coverage.

The Table above reports fuzzy subset consistency scores, using the formula mentioned above. The assessment is conducted for the four combinations that meet the frequency threshold-the combination must have at least one case with greater than 0.5 membership. The information in the Table above shows that its solution consistency is 0.94 and its solution coverage is 0.58, implying a very high degree of consistency [28].

The configurations of the conditions that affect high level of happiness in the business field in OECD countries are summarized in the Table 6.

Table 6: Summary of the configurations of the conditions determining happiness

Type	Configuration	Countries
Type1	fsGini-1*⌣fsworkhour*fsgdpcapita*⌣fshiring	Luxembourg, Australia, Sweden
	high Gini, low workhour, low gdp per capita, low hiring practices	
Type2	fsGini-1*⌣fsworkhour*fshiring*fscooperation	Denmark, Switzerland, Germany, Canada, Netherlands,
	high Gini, low workhour, high hiring practices, high cooperation	

		New Zealand
Type3	~fsworkhour*fsgdpcapita*fshiring*fscooperation	Switzerland, Denmark, United States
	low workhour, high gdp per capita, high hiring practices, high cooperation	
Type4	fsGini-1*fsgdpcapita*fshiring*fscooperation	Switzerland, Denmark, Ireland
	high Gini, high gdp per capita, high hiring practices, high cooperation	

As the explanations captured from the analysis by the fsQCA program indicate, there are four configurations of business conditions associated with a high level of happiness in the OECD countries. The first is the combination of high Gini coefficient, low work hours per annum, high GDP per capita, and low hiring and firing practices. Norway, Luxembourg, Australia and Sweden are included in this configuration. The second configuration is the combination of high Gini coefficient, low work hours per annum, high hiring and firing practices, and high labour–employer cooperation. Denmark, Switzerland, Germany and Canada are included in this configuration. The third configuration is low work hours per annum, high GDP per capita, high hiring and firing practices, and high labour–employer cooperation. Switzerland, Denmark and the USA are included in this configuration. Finally, the fourth configuration is high Gini coefficient, high GDP per capita, high hiring and firing practices, and high labour–employer cooperation. Switzerland, Denmark and Ireland are included in this configuration.

What these four configurations indicate is that, if a country accords with one of the four configurations, its happiness level may reach that of the countries whose happiness level is high. It means also that a country whose happiness level is low can try to benchmark that configuration which is closest to its own case in terms of independent variables. What is particularly interesting in this analysis result is that the four configurations applicable to the other OECD countries and other developing countries have something in common: low work hours per annum.

5. Conclusion

The main purpose of this study is to demonstrate specific configuration models explaining happiness in 35 OECD member countries, in order to (1) portray the causal connections among factors affecting happiness and (2) to put forward policy implications whereby each country can strengthen its happiness level. Following the requirements of the fsQCA model specification, we converted the actual value of each variable to membership and non-membership score using the TOSMANA software program, produced a truth table, and derived the four configuration explaining happiness in OECD member countries.

fsQCA is an alternative approach to the analysis of happiness that involves truth tables, Boolean algebra, and a search for a greater understanding of causal conditions. The use of fsQCA in happiness studies has rarely been reported, and there are likely to be conceptual and paradigmatic challenges to its adoption in some settings. The potential of fsQCA to refocus research questions and to offer a logical interpretation of combinations of qualitative and quantitative data may be especially useful for many small case studies.

This research collected data regarding the five independent variables and one dependent variable selected for analysis, and switched the original values of each variable into fuzzy set membership scores, using the thresholds produced by the Tosmana program. It then attempted to discover the configurations of business conditions affecting happiness, using fsQCA. It can be said that the four configurations discovered in this analysis are sufficient conditions for high levels of happiness in OECD countries.

The four configurations affecting happiness in the business field of OECD countries are summarized as follows. First one is fsGini-1*~fsworkhour*fsgdpcapita*~fshiring, meaning that Gini is higher, workhour is higher, GDP per capita is higher, and hiring is higher. And, this configuration includes Luxembourg, Australia, and Sweden. Second one is fsGini-1*~fsworkhour*fshiring*fscooperation, indicating that Gini is higher, workhour is lower, hiring is higher, and cooperation is higher. And it includes Denmark, Switzerland, Germany, Canada, Netherlands, and New Zealand. Third configuration is workhour*fsgdpcapita*fshiring*fscooperation, implying that workhour is higher, GDP per capita is higher, hiring is higher, and cooperation is higher. Switzerland, Denmark,and United States are included in the third configuration. Finally, the fourth configuration is fsGini-1*fsgdpcapita*fshiring*fscooperation, meaning that Gini is higher, GDP per capita is higher, hiring is higher, and cooperation is higher. This configuration includes Switzerland, Denmark, and Ireland.

This paper describes the use of a unique and innovative method of data analysis, fsQCA, which was used to examine what causal conditions can influence happiness, well-being and life satisfaction.

Developed as a social science research tool some years ago[25], fsQCA has had only a small amount of exposure in disciplines such as education and health [1][19] Schneider and Wagemann (2010) say that because it is a relatively new methodological tool, fsQCA is still a work in progress. They note that the general goal of fsQCA is to support the researcher in the attempt to arrive at a meaningful interpretation of the causal patterns displayed by the cases under examination. The use of fsQCA has been seldom reported in happiness studies, and there are likely to be conceptual and paradigmatic challenges to its adoption in some settings. However, happiness research will benefit from its techniques as it has great promise for tackling research questions that may defy more typical analysis and research methods. It is hoped that the research results may have useful policy-related and practical implications for policymakers in the area of happiness and business.

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