Country-based comparison analysis using fsQCA investigating entrepreneurial attitudes and activity

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Abstract

This study undertakes a cross-country comparison of the relationship between entrepreneurship attitudes and high and low entrepreneurial activity. The analysis employs fuzzy-set Qualitative Comparative Analysis. The data set comes from the Global Entrepreneurship Monitor 2011 survey, four country-level entrepreneurial attitudes and perceptions variables considered against Total Early-Stage Entrepreneurial Activity from a sample of 54 countries. This study provides comprehensive understanding of variations between individual countries at different levels of economic development and groups of countries in their level of opportunity and necessity-related entrepreneurial activity.

Keywords: Country; economic development; entrepreneurship activity; fsQCA; opportunity; necessity

1. Introduction

Globally, small and medium enterprises (SMEs) support innovation-focused economies, thus creating innovation, employment, and economic growth (Ács et al., 2012). Policymakers in developed economies therefore focus on firms seeking to grow (Ács et al., 2012).

Individuals undertake entrepreneurship for two reasons: To exploit potential opportunity or out of necessity (Ács et al., 2005; Tominc & Rebernik, 2007). Ács, Bosma, and Sternberg (2008) and Wennekers et al. (2005) also identify entrepreneurship having a U-shaped relationship with economic development.

In developing factor-driven economies (particularly necessity-based economies), entrepreneurship activity tends to be high but falls as economies enter the efficiency (manufacturing-dominated) phase; however, entrepreneurship activity rises again during the services, innovation-driven phase. Ács, Desai, and Hessels (2008) suggest that the U-shaped framework may be unsuitable for policymaking. Van Stel et al. (2005) argue that entrepreneurship plays differing roles in countries at different economic development stages, thus different combinations of factors may affect entrepreneurship.

The Global Entrepreneurship Monitor (GEM) survey is useful to research entrepreneurial activity and entrepreneurial attitudes and perceptions (EAaPs) in various country settings (Ács et al., 2012; Ul Haq et al., 2014). GEM uses the total early-stage entrepreneurial activity (TEA) measure, which the GEM defines as people actively involved in nascent entrepreneurship (i.e., business start-up), plus the business stage directly after start-up (i.e., between 3-42 months old) in owning/managing a new firm (Bosma et al., 2012), as a percentage of the adult (i.e., 18-64 years old) population (Wennekers et al., 2005).

UK's Department for Business Innovation & Skill (2013) relates TEA's importance to the enterprise culture and small businesses necessary for strong business

growth. This focus suggests a need for research using TEA to group countries by economic-development stage while simultaneously comparing drivers of entrepreneurship for policy-making.

Conjunctional causation, that is, that combinations of various causal conditions rather than one condition alone cause the outcome (Woodside, 2013), is also relevant for this study. This analysis draws on fuzzy-set Qualitative Comparative Analysis (fsQCA), a set-theoretic technique for causal-oriented investigation (Ragin, 2000, 2008). As a development on the original QCA (Ragin, 1987), fsQCA is increasingly popular across social sciences and business research, including country (Cheng et al., 2013), cross-cultural (Greckhamer, 2011), and corporate (Ganter & Hecker, 2014) levels.

This study considers four condition variables against TEA by using the GEM (2011) data set (Bosma et al., 2012) on a fsQCA analysis of TEA across a 54-country sample, reflecting EAaPs in these countries.

After this introductory section, section 2 explains the EAaP measures. Section 3 presents the method and pre-processing necessary for FsQCAs. Section 4 includes the technical and graphical explanation of the fsQCA analyses. Section 5 offers the interpretation of results, and section 6 presents conclusions the results and the use of FsQCA.

2. Entrepreneurial attitudes and perception (EAaPs) measures

This section outlines the four condition variables that measure EAaPs: Perceived opportunities, perceived capabilities, fear of failure, and entrepreneurial intention.

2.1. Perceived opportunities (Prcvd_Opps)

Entrepreneurship research increasingly considers the concept of opportunities (see Reynolds et al., 2003) as the most distinctive, fundamental characteristic of entrepreneurship (Arenius & Minniti, 2005) because inadequate entrepreneurial-activity levels result in deficient opportunities within existing businesses (Krueger, 2000).

This study draws on Bosma et al.'s (2012) definition of perception of entrepreneurial opportunities: The percentage of individuals believing that opportunities to undertake business start-up in the area they reside exist. Perceived opportunity can also drive opportunity entrepreneurship, generating higher economic growth than necessity-driven enterprises (Ács, 2006).

2.2. Perceived Capabilities (Prcvd Caps)

McGee et al. (2009) identify an established academic literature that classifies the business capabilities effective entrepreneurs require. Ács, Desai, and Hessels (2008) posit that people's perceptions of their environment and themselves drives them into, or away from, entrepreneurship. In this study, perceived capabilities reflect the percentage of entrepreneurial individuals believing they have the necessary competencies (i.e., skills, knowledge, and experience) for business start-up (Bosma et al., 2012). Perceived capability also differentiates independent entrepreneurs from entrepreneurial employees (Nyström, 2012).

2.3 Fear of failure (Fr_of_Flr)

Fear of entrepreneurship failure prevents individuals from undertaking business start-up (Vaillant & Lafuente, 2007) because many individuals are risk adverse (Arenius & Minniti, 2005). USA entrepreneurs tend to accept business failure, which they consider a positive experience because business failure enhances entrepreneurial knowledge and competency (Vaillant & Lafuente, 2007). Ul Haq et al. (2014) find no relationship between fear of failure and entrepreneurship in China and Pakistan. However, significant social stigma regarding business failure remains in Europe (European Commission, 2004).

Bosma and Levie (2009) demonstrate that in factor-driven and efficiency-driven countries, those entrepreneurs with highest fear of failure rates also have the lowest intention rates. Japan and Malaysia are exceptions where fear of failure prevents people from identifying most opportunities. This study utilizes the GEM definition (Bosma et al., 2012) of business failure.

2.4 Entrepreneurial intention (Entrp_Intnt)

Entrepreneurial intentions are the expectation of individuals to start a business (Bosma et al., 2012). Autio et al. (2001) identify several entrepreneurial intent drivers from planned behavior theory. Entrepreneurial intent can be personally and socially (including culturally) driven, and measures an economy's favorability towards (necessity and opportunity-driven) entrepreneurship. This study uses the GEM definition, which refers to individuals (excluding those individuals already participating in entrepreneurial activity) intending to start a business within the next three years.

This discussion identifies four EAaPs-related condition variables that may potentially affect TEA. Underlying national, cultural, and economic development-level characteristics may affect these variables. A need exists, therefore, for a method able to examine the potential effects of the combinations of these factors upon entrepreneurial activity in different national economies.

3. Data, method, and data pre-processing

3.1 Data

The data comes from the GEM (2011) survey in Bosma et al. (2012) (see Table 1).

Table 1 here.

Table 1 presents the definitions of the EAaPs and TEA outcome variables. This study identified 54 countries with full data available. GEM divides these countries into factor-driven economies, efficiency-driven economies, and innovation-driven economies (see Xavier et al., 2012), building on the World Economic Forum's (WEF) *Global Competitiveness Report*, which identifies three economic development phases depending on gross domestic product per capita and share of exports comprising primary goods.

In the factor-driven phase, heavy reliance on (unskilled) labor and natural resources (i.e., agriculture and extraction) is dominant. In the efficiency-driven phase, industrialization, economies of scale, and capital-intensive large organizations are more dominant. In the final, innovation-driven phase, businesses are more knowledge-intensive, and the service sector expands.

Jones et al. (2014) identify that countries can be at the same stage of economic development with significantly different entrepreneurial activity levels. This study also evaluates how this categorization of countries contrasts with the groupings that the fsQCA identifies.

3.2 Method

Ragin's fuzzy-set Qualitative Comparative Analysis (fsQCA) offers a set-theoretic approach to causality analysis, in respect of conditions and an outcome (Ragin, 2008). The inclusion of fuzzy-sets in QCA allows fsQCA to explore how membership of cases in causal conditions relates to their membership in the outcome (Woodside, 2013).

Features of fsQCA include the ability to model conjunctural causation, where combinations of conditions rather than one condition alone cause the outcome (Woodside, 2013). In addition, fsQCA has the potential to capture equifinality, where more than one combination of causal conditions may give same outcome (Fiss, 2007). Furthermore, fsQCA can analyze small-n data, which allows this study to analyze the 54-country sample. This study uses fsQCA v2.0 software (Ragin et al., 2008).

3.3 Pre-processing

This study pre-processes data by transforming the condition and outcome variables' values from interval-scale values to fuzzy-membership scores over the consistent 0.0 domain (which signals full exclusion "non-membership" from a set) to 1.0 domain (which signals full inclusion "membership") (Woodside et al., 2011), to construct a "continuous" fuzzy set for each variable. This study also uses the direct method (see Ragin, 2008) and draws on researcher-specified threshold qualitative anchors to determine full membership (upper-threshold), full non-membership (lower-threshold), and the crossover point.

Evaluation of the three qualitative anchors for each variable comes from Andrews et al. (2015) and Barton and Beynon (2015) and involves the identification of the 5^{th} percentile (lower-threshold), 95^{th} percentile (upper-threshold) and 50^{th} percentile (cross-over point) values by building on a probability-density function (PDF) graph for each variable (see Appendix A). Following Greckhamer (2011), this study identifies cases (i.e., countries) surrounding identified anchors and considers those cases against threshold terms of full-non-membership, full-membership, and the cross-over point. Discussion with experts in the field of entrepreneurship research confirms the threshold values as acceptable across all variables. See Figure 1, which shows how the original variable scaled values transform into membership scores.

Figure 1 here.

Graphs in Figure 1 represent fuzzy membership score functions for the four conditions (Prcvd_Opps, Prcvd_Caps, Fr_of_Flr, and Entrp_Intnt) and one outcome variable (TEA). In the analysis of high and low TEA, this study identifies the fuzzy membership value (μ_i) using the TEA membership score function in Figure 1e (in the Figure the $\mu_{\text{High TEA}}$ membership value is given, from which $\mu_{\text{Low TEA}} = 1 - \mu_{\text{High TEA}}$ can also be found).

4. FsQCA analysis of country-level entrepreneurial data set

This section presents the findings from fsQCA analyses for outcomes TEA (High TEA) and ~TEA (Low TEA).

Table 2 here

In Table 2 the truth table's rows represent the 16 configurations for which strong membership-based associations are possible. All 16 possible configurations associate with at least one case (country) in terms of strong membership. The last two columns in Table 2 show the respective raw consistency values—which measures proportion of memberships in fuzzy terms in the outcome each logical configuration explains (see Ragin et al., 2008)—associating a configuration with TEA and ~TEA. The later analysis includes only those configurations that associate with at least two countries.

Subject to a consistency threshold value, certain configurations assign with both outcomes TEA and ~TEA. The choice of the consistency threshold for the raw consistency measure affects the strength of evidence that subsequent analyses use (Ragin, 2006). This study sets the consistency threshold value on 0.87, which is above the lower bound of 0.75 (see Ragin, 2008). The study chooses this consistency threshold value so that no configuration assigns 1 in both analyses of TEA and ~TEA outcomes (see Table 2).

Configurations 10 and 13 in Table 2 each contain only one country. These configurations represent the logical remainders. This study identifies the complex solution (i.e., the minimal formula without the aid of logical remainders) and the parsimonious solution (i.e., minimal formula with the aid of logical remainders) (Rihoux & Ragin, 2009).

Ragin and Fiss (2008) give a succinct approach to presenting solution-based findings. Table 3 presents the complex and parsimonious solutions differentiating core versus peripheral causal conditions.

Table 3 here.

In Table 3, each column represents an alternative combination of conditions that associate to the respective outcome, that is, a causal recipe: Through the set-theoretic underpinnings of fsQCA (see Ragin, 2008) a specific combination of causally relevant variables that associate to an outcome. Full circles (●) indicate presence of a condition, barred circles (⊖) indicate a condition's absence. Larger circles indicate core conditions (presence or absence) that are part of parsimonious and complex solutions. Unique consistency measures the degree to which cases sharing a given condition agree in displaying the relative outcome. Raw coverage measures overall coverage of a combination that may overlap with other combinations. Unique coverage refers to coverage uniquely due to a combination.

For TEA, two complex and two parsimonious causal recipes describe presence of TEA (high TEA). For ~TEA (low TEA) four and two causal recipes associate with complex and parsimonious solutions, respectively.

5. Discussion

Figure 2 presents the groupings of the 54 countries in the sample. Table 4 presents the groupings of the countries in the GEM survey drawing on WEF's three phases of economic development. For example (1: 0000) means that configuration 1 has absence of Prcvd_Opps, absence of Prcvd_Caps, absence of Fr_of_Flr, and absence of Entrp_Intnt.

Figure 2 here.
Table 4 here.

Shading in the Venn-diagram in Figure 2 corresponds to the outcome a configuration associates with: Dark gray associates with TEA; light gray shading indicates ~TEA. White signifies no association to TEA or ~TEA.

5.1 TEA

Of the two sets of causal recipes, CO1/PO1 and CO2/PO2 in the parsimonious solution for the outcome TEA, the more empirically dominant of these sets is CO1/PO1 because PO1 has a unique coverage of 0.306, above that of 0.144 for PO2. The details of CO1/PO1, ●Prcvd_Caps, ⊖Fr_of_Flr and ●Entrp_Intnt, indicate presence of perceived entrepreneurial capabilities, absence of fear of failure and presence of entrepreneurial intention.

This recipe takes in both 6: 0101 (Croatia and Slovakia) and 14: 1101 groupings in the Venn-diagram in Figure 2. The second grouping includes 11 of the 12 countries from the Latin-American and Caribbean region: Guatemala, Jamaica, Venezuela, Argentina, Brazil, Chile, Mexico, Panama, Uruguay, Trinidad and Tobago, and Columbia (see Table 4). In terms of the CO2 causal recipe, ●Entrp_Intnt, ●Fr_of_Flr and ●Prcvd_Opps, three of the 11 Asia Pacific and South Asia-grouping countries within the sample are present: Bangladesh, China, and Thailand.

All countries demonstrating high TEA are factor-driven or efficiency-driven economy countries but not innovation-driven. Absence of fear of failure in CO1 supports Arenius and Minniti (2005), who find that fear of failure has significant and negative effects on nascent entrepreneurship (see also Ács, Bosma, and Sternberg, 2008). However, fear of failure is present for CO2, along with perceived opportunity, and entrepreneurial intent.

5.2 ~TEA

Of the two causal recipes, PN1 and PN2, in the parsimonious solution for ~TEA, the empirically dominant is PN1 with ⊖Entrp_Intnt (i.e., absence of entrepreneurial intent) also present in the three complex causal recipes that PN1, and CN1, CN2, and CN3 cover.

Within these causal recipes, considerable overlap exists in the types of countries. Countries in configuration 1 (0000) are Malaysia, Turkey, Czech Republic and Ireland (see Figure 2). From Table 4, Malaysia and Turkey are efficiency-driven economies, and Czech Republic and Ireland are innovation-driven economies.

Ramayah and Harun (2005) identify in Malaysia the lack of students' intention and capability to step into entrepreneurship, thus supporting Malaysia's association with ~TEA. Vasiliadis and Poulios (2007) identify family/friends' support as critical because graduates start businesses building on family resources. Regarding Ireland, Xavier et al. (2012) suggest the current predominance of established business owners rather than entrepreneurs.

CN4/PN2 highlights some countries (including a large number of EU countries) with lack of TEA, not because of lack of entrepreneurial intent, but because of a combination of lack of perceived opportunities and capabilities. Policies to increase capability and opportunity may therefore be most relevant, particularly for innovation-driven countries such as France and Taiwan.

For another group of countries (configuration 3), including Lithuania, Germany, Japan, Russia, Singapore, South Korea and the United Kingdom, all four complex causal recipes (CN1, CN2, CN3, CN4) are relevant. The sets of reasons for relatively low entrepreneurship activity and resultant policy solutions are therefore complex and overlapping.

6. Conclusions

This analysis demonstrates that fsQCA provides a novel method to compare and contrast entrepreneurial performance, relating that entrepreneurship to sets of entrepreneurship drivers. The study also specifically differentiates innovation-driven economies (and some efficiency-driven economies) from factor-driven and (other) efficiency-driven countries in terms of positive TEA.

The results show possible combinations of factors driving entrepreneurship in high and low TEA economies. For most high TEA countries, levels of entrepreneurship relates more to entrepreneurial intention, capacity, and lack of fear of failure, rather than perceived entrepreneurial opportunity (with intention). For low TEA countries, reasons are more complex, as the greater number of causal recipes and greater overlap of countries into multiple recipe groupings show.

Using fsQCA in this study provides fresh insight into relationships between entrepreneurial activity and entrepreneurial attitudes and perceptions, entrepreneurial intention being particularly relevant. These results are also relevant to government decision-makers and GEM. These results could be potentially useful in informing economic policy by identifying the country groupings of most relevance when comparing TEA performance and drivers.

Appendix A

Figure A1. PDF and fsQCA's direct method's parameter values for the condition Prcvd_Opps

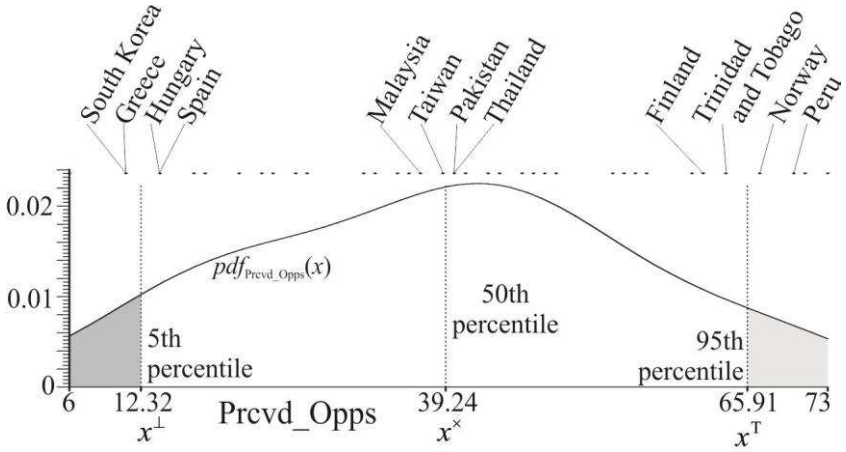

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Table 1. Definitions of variables used in analysis

Variable	Description
Perceived opportunities (Prcvd_Opps)	Percentage of 18–64 age group who see good opportunities to start a firm in the area where they live.
Perceived capabilities (Prcvd_Caps)	Percentage of 18–64 age group who believe they have the necessary skills and knowledge to start a business.
Fear of failure (Fr_of_Flr)	Percentage of 18–64 age group with positive perceived opportunities who indicate that fear of failure would prevent them from setting up a business.
Entrepreneurial intention (Entrp_Intnt)	Percentage of 18–64 age group (individuals involved in any stage of entrepreneurial activity excluded) who intend to start a business within three years.
Total Early-Stage Entrepreneurship Activity (TEA)	Percentage of 18–64 age group who are either a nascent entrepreneur or owner-manager of a new business (as defined above).

Table 2. All configurations existing from data, building on variables Prcvd_Opps, Prcvd_Caps, Fr_of_Flr, Entrp_Intnt, and outcome TEA

Configuration	*PO*	*PC*	*FF*	*EI*	Number of countries that associate with configuration	Consistency	
						TEA Raw	~TEA Raw
1	0	0	0	0	4	0.638	0.961
2	0	0	0	1	2	0.814	0.909
3	0	0	1	0	7	0.540	0.967
4	0	0	1	1	3	0.801	0.882
5	0	1	0	0	3	0.735	0.912
6	0	1	0	1	2	0.875	0.845
7	0	1	1	0	3	0.670	0.962
8	0	1	1	1	2	0.865	0.867
9	1	0	0	0	5	0.648	0.985
10	1	0	0	1	1	0.896	0.877
11	1	0	1	0	3	0.631	0.971
12	1	0	1	1	3	0.887	0.802
13	1	1	0	0	1	0.850	0.840
14	1	1	0	1	11	0.954	0.517
15	1	1	1	0	2	0.757	0.946
16	1	1	1	1	2	0.904	0.723

Note. PO = Prcvd_Opps; *PC* = Prcvd_Caps; *FF* = Fr_of_Flr; *EI* = Entrp_Intnt

Table 3: Sufficiency analyses results for TEA and ~TEA outcomes (including complex and parsimonious solutions)

Conditions	**TEA**		**~TEA**			
Prcvd_Opps		●		⊖		⊖
Prcvd_Caps	●		⊖			⊖
Fr_of_Flr	⊖	•			•	
Entrp_Intnt	●	●	⊖	⊖	⊖	
Complex Solution	**CO1**	**CO2**	**CN1**	**CN2**	**CN3**	**CN4**
Configurations	6, 14	12, 16	1, 3, 9, 11	1, 3, 5, 7	3, 7, 11, 15	1, 2, 3, 4
Consistency	0.905	0.870	0.960	0.915	0.948	0.882
Raw Coverage	0.596	0.399	0.685	0.638	0.626	0.580
Unique Coverage	0.306	0.109	0.061	0.067	0.024	0.053
Solution Consistency	0.872		0.873			
Solution Coverage	0.705		0.873			
Parsimonious solution	**PO1**	**PO2**	**PN1**			**PN2**
Configurations	6, 14	10, 12, 14, 16	1, 3, 5, 7, 9, 11, 13, 15			1, 2, 3, 4
Consistency	0.905	0.908	0.858			0.882
Raw Coverage	0.596	0.682	0.854			0.580
Unique Coverage	0.306	0.144	0.328			0.053
Solution Consistency	0.875		0.825			
Solution Coverage	0.741		0.908			

Table 4. Countries by country grouping and economy classification

Country grouping	Factor-driven economies	Efficiency-driven economies	Innovation-driven economies
Latin-America & Caribbean	Jamaica, Venezuela	Argentina, Barbados, Brazil, Chile, Columbia, Mexico, Panama, Peru, Trinidad and Tobago, Uruguay	
Middle East & North Africa	Algeria, Iran		UAE
Sub-Subharan Africa		South Africa	
Asia Pacific & South Asia	Bangladesh, Guatemala, Pakistan	China, Malaysia, Thailand	Australia, Japan, South Korea, Singapore, Taiwan
European Union		Hungary, Latvia, Lithuania, Poland, Romania, Slovakia,	Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Netherlands, Portugal, Slovenia, Spain, Sweden, United Kingdom
Non-European Union		Bosnia and Herzegovina, Croatia, Russia, Turkey	Norway, Switzerland
North America			USA

Figure 1: Plots of degrees of membership to the condition (Prcvd_Opps, Prcvd_Caps, Fr_of_Flr and Entrp_Intnt) and outcome (TEA) variables using Direct Method

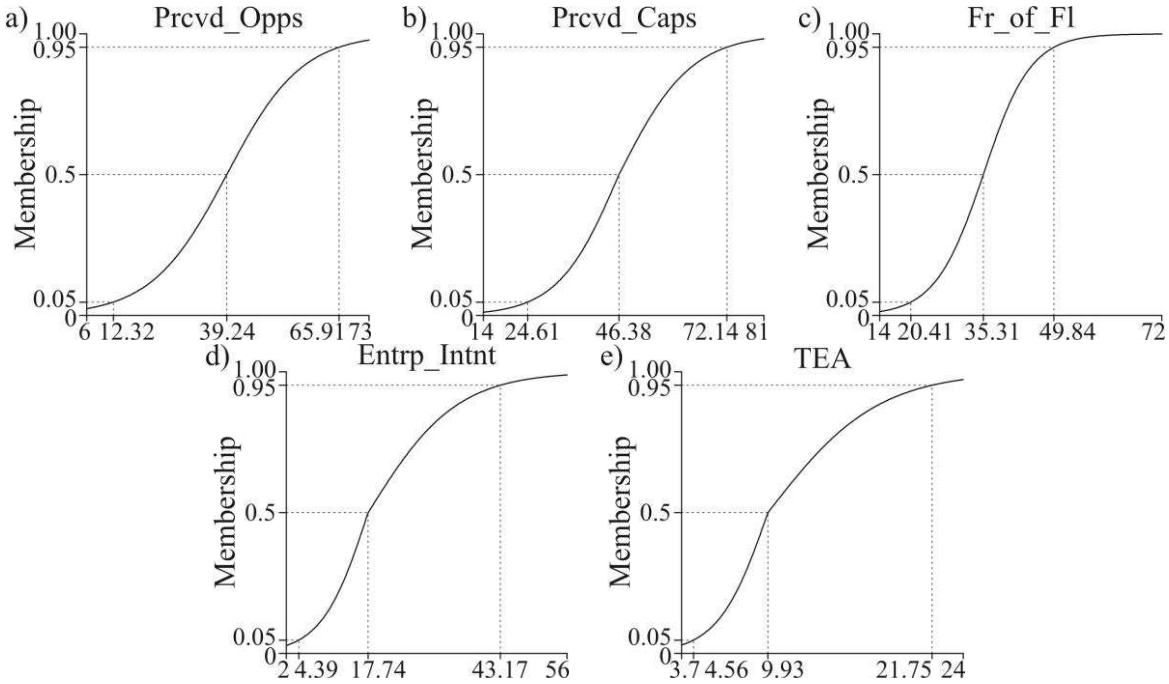
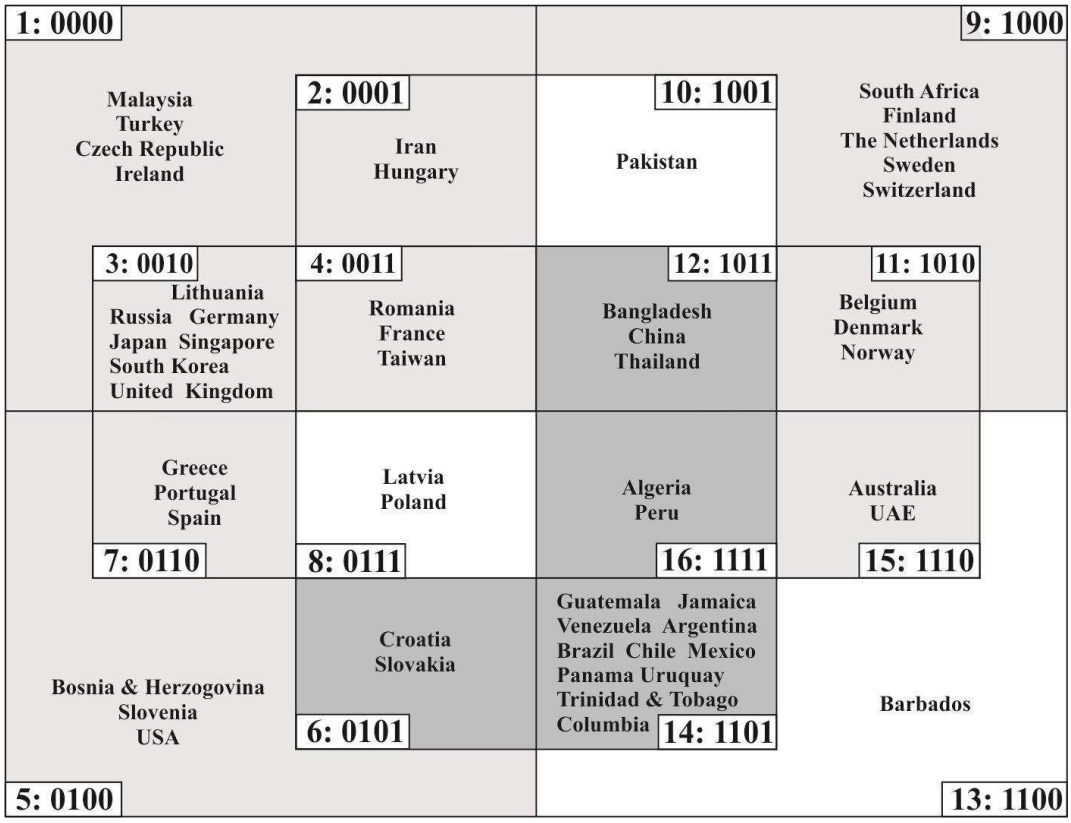


Figure 2. Venn Diagram (with four conditions)



Note. In each region the index is the configuration number and 0s and 1s describing configuration.