

Why older workers become entrepreneurs? International evidence using fuzzy set methods

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Contents

- 1 Introduction
- 2 Empirical strategy
 - Fuzzy sets
 - Qualitative Comparative Analysis
- 3 GEM 2015 APS Data
- 4 Results
 - Regression analysis
 - fsQCA analysis
- 5 Conclusions

Section 1

Introduction

Entrepreneurship is generally associated with youth, but third-age entrepreneurship should not be considered as marginal.

"People may retire from jobs as employees or as self-employed, but may continue to pursue ventures"(Schott et al., 2017).

- Analyze necessity-drive-entrepreneurship among the third-age using fsQCA
- Identify aspects that may be unnoticed: *one size does not fit all*

Section 2

Empirical strategy

Fuzzy sets

- A fuzzy set measures, in $(0, 1)$, the degree of fulfilment of a characteristic (Zadeh, 1965).

A fuzzy is a generalization of a dummy (more precise for modelling)

- Definition: *Direct Method* (Ragin, 2007)

Figure 1. Ragin's direct method pseudo-code

```
For each variable  $X_i$  {  
  Median $_i$ =median( $X_i$ )  
  P1 $_i$ =percentile( $X_i$ , 1)  
  P9 $_i$ =percentile( $X_i$ , 9)  
  For each observation  $j$  {  
    Deviation $_{ij}$ = $X_{ij}$  - Median $_i$   
    Ratio $_{ij}$ =3/( P9 $_i$  - Median $_i$ ) if Deviation $_{ij}$ >0  
    Ratio $_{ij}$ =3/( Median $_i$  - P1 $_i$ ) if Deviation $_{ij}$ <0  
    Logodd $_{ij}$ =Deviation $_{ij}$ *Ratio $_{ij}$   
    Fuzzy-set score $_{ij}$ =exp(Logodd $_{ij}$ )/(1 + exp(Logodd $_{ij}$ ))  
  }  
}
```

Note: this scheme is a particular case of Ragin's (2007) direct method to define fuzzy sets.

fsQCA

- OLS are restrictive and may be inappropriate:
 - 1) Non-linear relationships
 - 2) Different recipes to reach the outcome

- fsQCA study a different perspective: combinations of *sufficient conditions* that make observations reach certain *outcome*
 - 1) Construction of a *Truth Table* (Quine-McCluskey)
 - 2) Consistency($X \Rightarrow Y$) = $\frac{\sum \min(X_i, Y_i)}{\sum X_i}$ (see Ragin, 2008).

Section 3

GEM 2015 APS Data

GEM Data

- The Global Entrepreneurship Monitor (GEM) is "the world's foremost study of entrepreneurship"
- GEM provides high quality data:
 - 1) Entrepreneurial behaviors/attitudes → APS data
 - 2) The national context → NES data
- Sample: Individuals from GEM 2014 APS data, between 55-64 years

Restricted to third age (55-64 years). Non-developed economies are not considered.

Variables (country-level)

Outcome: probability of being a necessity-driven entrepreneur, conditioned to being between 55-64 years.

Conditions:

- Entrepreneurial and managerial skills
- Recognition of opportunities to entrepreneurs
- Being exposed to peer effects
- Perception of entrepreneurship as a desirable career
- Satisfaction with income
- Satisfaction with life

Section 4

Results

Regression analysis

Estimate the following equation for developed and developing countries:

$$Y_i = \beta_0 + \sum_{i=1}^6 \beta_i X_i + \varepsilon_i$$

- Developed countries:
 - Opportunity vs necessity
 - Social valuation of entrepreneurship
- Developing countries: zero interpretation!

Table 2. Regression model estimates

Variables	(1) Developed	(2) Developing
Skills	0.001 (0.009)	0.002 (0.011)
Opport	-0.020*** (0.007)	0.041 (0.030)
Peer	0.004 (0.008)	-0.011 (0.012)
Perception	0.026** (0.011)	-0.023 (0.032)
Satinc	-0.005 (0.006)	-0.002 (0.009)
Satlife	0.004 (0.006)	-0.013 (0.010)
Constant	0.015*** (0.004)	0.043*** (0.009)
Observations	28	28
R-squared	0.333	0.252

Note: Robust standard errors in parentheses.
Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

fsQCA analysis

- Developed countries:
 - Importance of skills and perception, but \exists alternatives
 - Strong presence of peer effects
 - Necessity vs opportunity
- Developing countries: more complex
 - Subsistence?

!! *One size does not fit all*

Table 3. FsQCA: sufficient conditions of necessity entrepreneurship

Conditions	Coverage	Consistency
A) Developed countries		Overall: 0.736
~skills*~opport*~perception*~satinc*~satlife	0.410	0.889
skills*~opport*peer*perception*~satinc	0.227	0.818
skills*~opport*peer*perception*satlife	0.292	0.773
skills*opport*peer*~perception*satinc*~satlife	0.205	0.932
B) Developing countries		Overall: 0.761
skills*~opport*~perception*~satinc*satlife	0.157	0.817
~skills*opport*peer*perception*~satlife	0.248	0.818
~skills*opport*~peer*perception*~satinc*satlife	0.188	0.822
skills*opport*peer*perception*~satinc*satlife	0.172	0.797
skills*~opport*~peer*~perception*~satlife	0.248	0.777
skills*~opport*~peer*~perception*~satinc	0.268	0.859

Note: Quine McCluskey algorithm. “~” represents lower levels of belonging to the correspondent feature group.

Section 5

Conclusions

Conclusions

- Different countries entrepreneur according to different recipes: ≠ universal patterns.
- Most common recipes:
 - 1) Developed: pure necessity
 - 2) Developing: necessity combined with skills, or with opportunity+social norms+peer effects
- Necessity-driven entrepreneurship among the third-age appears a more common choice in developing countries

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