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Macro-Level Predictors of Old-Age Threshold Perception: A Comparative Study Using ESS, Ipsos, and Eurobarometer Data

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Abstract:

Purpose: *Perception of age, at which people start being considered as "old" is a complex and multidimensional issue. Such subjective impressions depend on the number of personal factors, such as: age, gender, or socioeconomic status. To some extent, however, they depend also on broader context. The article's main aim is to recognize differences between countries regarding the average perception of the old-age threshold and to evaluate macro-level factors determining these differences.*
Design/Methodology/Approach: *Data from three different international surveys were used: Eurobarometer (2011), European Social Survey (round 9, 2018), and Ipsos (2018). Analysis was carried out using a linear correlation matrix (to set the strength and direction of the relationship) and a multiple regression model (to set the form of relationship).*
Findings: *The average perception of the old-age threshold varies from country to country. The main predictors of this variation are, healthy-life expectancy at the age of 60, the median age of the population, and retirement age. As those factors are higher across countries, the old age is perceived (on average) as starting later.*
Practical Implications: *Perception of old age threshold depends on predictors that are (directly or indirectly) strongly related to the modernization process, and more precisely to the technological, social and economic development.*
Originality/Value: *We analyzed the impact of macro-level variables (contextual factors) on the average (in-country) perception of the old-age threshold using data from three different international surveys. Such data triangulation gave more comprehensive recognition of the research problem and increased the validity of obtained results.*

Keywords: *Ageing, old age threshold, perception, social context, retirement, life expectancy.*

JEL Classification: *I19, J14*

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1. Introduction

The old-age threshold (OAT) is a demarcation point in the life-cycle, crossing which results in transition into old age. It may be either objective or subjective. The objective threshold is based on medical, psychological, social, economic, or/and legal features (Balachandran and James, 2019; Dziechciaż and Filip, 2014; Havighurst and Glasser, 1972; Hori, 1994; López-Otín *et al.*, 2013). Subjective threshold, in turn, is based on individual opinions and impressions that reflect imagination about the onset of old age.

Perception of the old-age threshold is a complex and multidimensional issue. There is no universal, commonly agreed age at which people should be considered as old. Each individual creates their own opinion, whether it is lower or higher. This opinion depends on the number of personal characteristics. Thirst of all, it is not static, but changes with age, so that older people tend to perceive old age as starting later than younger ones (Cameron, 1969; Chopik *et al.*, 2018; Drevenstedt, 1976; Kuper and Marmot, 2003; Taylor *et al.*, 2009; Weiss and Kornadt, 2018). Secondly, gender is a significant factor, women tend to perceive old age as starting later than men (Barrett and Von Rohr, 2008; Kuper and Marmot, 2003; Taylor *et al.*, 2009).

Thirdly, socioeconomic status influences individual opinion, people with higher status tend to perceive old age as starting later than people with lower status (Kuper and Marmot, 2003; Peters, 1971). Moreover, as a complex feature, socioeconomic status includes a number of interrelated traits that influence ones' perception, such as health status, life expectancy, and life-course trajectory (Barrett, 2003).

Although each person creates his or her own impression about old-age threshold, they are not fully independent in this field. Their cognitive autonomy is limited by the broader context. They are deeply rooted in institutions, values, and norms that are common to all society members. As a result, the image of old age, including its onset, varies from one society to another (Arnhoff *et al.*, 1964; Giles *et al.*, 2000; Löckenhoff *et al.*, 2009). It changes over time and across nations. Therefore perception, to some extent, is similar in a given country (society) and different from other countries (societies).

This variation can be explained twofold. Firstly, old age, as well as the whole life course, is a social construct (Kohli and Meyer, 1986; Phillipson, 1982). As so, the meaning of the aging process and the thresholds of life stages is constituted by society. Secondly, old age is a concept attributed to society as a habitus (Gilleard and Higgs, 2017). As so, understanding of old age arises (mostly unconsciously) from the cultural field in which it is co-assembled. It means that every society develops its own pattern of perception, which is a collective way of perceiving the onset of old age.

Determinants of collective perception of the old-age threshold are poorly recognized. While relatively much attention was devoted to individual factors, contextual aspect was rather ignored in empirical research so far. To some extent, it is because common belief that perception is an individual case and therefore should be investigated at the micro-level. Furthermore, previous qualitative research revealed very limited influence of macro-level factors. Ayalon *et al.* (2014) basing on European Social Survey data (round 4), found that macro-level predictors explain only 5,7% of the variance of old-age threshold perception.

Nevertheless, another study revealed significant intercultural differences in perception of the old-age threshold. Frąckowiak *et al.* (2020) compared two extreme examples: traditional and modern society. In modern society, the onset of old age occurred to be perceived as much higher than in traditional society. On this basis, it can be presumed that process of modernization (social change, economic development, and technical progress) changes the overall perception of the old-age threshold.

This intercultural variation of overall perception can be explained in two ways. First, according to Fogel and Costa, (1997) "technophysio evolution theory", technological progress changes human beings and the timing of life stages. People live longer and become more vital. The physical symptoms of old age, such as impairment or geriatric diseases, arise at an increasingly later age. Secondly, according to Cowgills' (1974) "salient aspects of modernization" concept, the modernization process results in a lowering status of elderly people. If so, members of modern societies, to avoid stigma, tend to "dissociate" from old age, or more precisely: tend to enhance mental distance from old age by. among others, retarding its onset (Montepare and Lachman, 1989; Weiss and Lang, 2012).

In this article, we undertake empirical verification of these assumptions. We carry out an international comparative study of the perception of the old-age threshold. The main aim is to recognize differences between countries and to evaluate macro-level factors determining these differences. We take into consideration aggregated data, that represent the average perception of age, at which people start being considered as "old". We treat counties as a separate entities, with their own characteristics: age, culture, health, or socioeconomic status. Such an approach does not mean that we undermine the importance of individual (micro-level) factors. They play a crucial role in shaping perception. We only try to draw attention to other (broader) aspects of this problem.

Our study uses data from three different international surveys (Eurobarometer, European Social Survey, and Ipsos). Such data triangulation is expected to give more comprehensive recognition of the research problem and increase the validity of obtained results (Wilson, 2014).

2. Methods and Data

2.1 Data

We use data from three international surveys, Eurobarometer, European Social Survey, and Ipsos. Due to different research construction, the results of each of these surveys are incomparable. First of all, all surveys included the question about the perception of old-age threshold, but in each case, it was phrased differently. Secondly, the timing of the surveys was different. Thirdly, surveys were carried out in (partially) different countries. Fourthly, each survey covered a different category of respondents. And fifth, there were different methods of collecting information in each survey.

The first survey was conducted under Eurobarometer, by request of the Directorate-General for Employment, Social Affairs and Inclusion (Erobarometer, 2012). The overall study was titled "Active Aging" and was organized on the occasion of "European Year for Active Ageing and Solidarity between Generations" (2012). Field research was carried out in the period, September-November 2011. It was conducted in 32 European countries (27 EU and 5 non-EU). The total sample size was 31 280 (26 728 from EU27 and 4 557 from non-EU). Respondents were people aged 15+. Information was collected using the CATI method. The question about the old-age threshold (QB2) was phrased: "In your opinion, thinking about the age when one starts to be regarded as "old", at what age would you say that happens?".

The second survey was conducted under European Social Survey (European Social Survey Round 9 Data, 2018). It is a cyclical (every two years) study carried out since 2002. It consists of two modules, fixed and rotating. The fixed module is repeated in every round, and the rotating module changes with every round. So far, perception of old-age threshold was investigated three times: twice in the "Timing of life" module in rounds 3 (2006) and 9 (2018), and once on the "Experiences and Expressions of Ageism" module in round 4 (2008).

In our study, we used data from round 9. Field research was carried out in the period, 1st September - 31st December 2018. It was conducted in 30 European countries. The total sample size was 48 363. Respondents were people aged 15+. Information was collected via face-to-face CAPI interviews. The question about the old-age threshold (D17a/b) was phrased: "And at what age, approximately, would you say women/men reach old age?".

The third survey was conducted by Ipsos in partnership with the Centre for Aging Better (Boyon et al., 2019)[2]. The overall study was titled "Views on Aging". Field research was carried out in the period, 24th August - 7th September 2018. It was

[2]*Detailed data was obtained directly from the company conducting the survey.*

conducted in 30 countries all over the world. The total sample size was 18 262. Respondents were people aged 16064 (18-64 in the USA and Canada). Information was collected via an online panel system. The question about the old-age threshold (QF2) was phrased: "Think about the phrase old age, at what age do you think people can be considered to be old?".

2.2 Variables

Dependent variable is OAT (old-age threshold), an average value of responses indicated by respondents in questions about the onset of old age. Data was aggregated on the country level.

Independent variables are contextual (macro-level) features that potentially may influence the perception of the old-age threshold. They were collected independently from the main survey (concerning dependent variable) and to reflect the period of this survey (or at least, if not available, best suited). They are grouped into five domains: (1) socioeconomic development, (2) demographic situation, (3) health situation, (4) cultural context, and (5) institutional settings. All independent variables are listed in Table 1.

(1) *Socioeconomic situation:* since at the micro-level socioeconomic status influences individual perception of old-age threshold, it can be presumed that it is similar at the broader scale. In this section following macro-level indicators were distinguished as independent variables, Human Development Index, Gross Domestic Product per capita, Gini index, and labor-force participation rate among older adults.

(2) *Demographic situation:* since at the micro-level perception of old-age threshold is changing with age; consequently, it may be expected that age-composition of the population influences the overall (aggregated) perception. In this section following macro-indicators were distinguished as independent variables: median age, the share of people aged 65+ in population, and old-age dependency ratio.

(3) *Health situation:* commonly, old age is associated (in biological terms) with impairment and multiple morbidities. As so, it may be presumed that the health condition influences the perception of the old-age threshold. In this section following macro-indicators were distinguished as independent variables, healthy life expectancy at the age of 60, and total expenditures on health (as a percentage of GDP).

(4) *Cultural context:* we assume that the old-age threshold is a social construct, deeply rooted in tradition, norms, and values. As so, perception is influenced by cultural features. In this section, we used Hofstede's six-dimensional model of national culture. Each dimension is quantified as a country score. Those scores were adapted as independent variables.

(5) *Institutional settings:* commonly, labor-force withdraw defines the transition (in economic terms) from adulthood to old age. In this perspective, retirement legislation may influence the perception of the old-age threshold. In this section, one macro-indicator was distinguished as an independent variable: retirement age.

Table 1. *List of independent variables*

Domain	Label	Description	Source
Socioeconomic situation	HDI	Human Development Index	Human Development Data Center http://hdr.undp.org/en/data
	GDP	Gross Domestic Product per capita	Human Development Data Center http://hdr.undp.org/en/data
	Gini	Gini index	World Bank data https://data.worldbank.org/indicator
	LFPR60-64	Labour force participation rate of people aged 60-64 (overal)	ILOstat https://ilostat.ilo.org
	LFPR65+	Labour force participation rate of people aged 65+ (overal)	ILOstat https://ilostat.ilo.org
Demographic situation	SHARE65+	Share of people aged 65+ in total population	World Population Prospect, Population Division (UN) https://population.un.org/wpp/
	OADR	Old-age dependency ratio, number of people aged 65+ per 100 population 15-64	World Population Prospect, Population Division (UN) https://population.un.org/wpp/
	MA	Median age	World Population Prospect, Population Division (UN) https://population.un.org/wpp/
Health situation	HALE	Healthy life expectancy at age 60 (both sexes)	WHO Global Health Observatory https://www.who.int/data/gho/data/indicators
	EXPEND	Total expenditure on health as a percentage of GDP	WHO Global Health Observatory https://www.who.int/data/gho/data/indicators
Cultural context	PDI	Power Distance Index	Hofstede Insights www.hofstede-insights.com
	IDV	Individualism versus Collectivism	Hofstede Insights www.hofstede-insights.com
	MAS	Masculinity versus Feminism	Hofstede Insights www.hofstede-insights.com
	UAI	Uncertainty Avoidance Index	Hofstede Insights www.hofstede-insights.com
	LTO	Long-Term Orientation versus Short-Term Orientation	Hofstede Insights www.hofstede-insights.com

	IVR	Indulgence versus Restraint	Hofstede Insights www.hofstede-insights.com
Institutional settings	RA	Retirement age (average for men and women)	Trading Economics https://tradingeconomics.com

Source: *Own elaboration.*

3. Analysis

The study aims to recognize differences between countries and to evaluate the impact of macro-level factors (independent variables) on the overall (average) perception of the old-age threshold (dependent variable). Analysis of dependency was carried out using a linear correlation matrix (to set the strength and direction of the relationship) and a multiple regression model (to set the form of relationship). Initially, the regression model included all independent variables significantly correlated with the dependent variable ($p < 0,05$). Afterward, they were stepwise removed until the elimination of multicollinearity and remaining only factors significantly predicting the dependent variable.

In the study, we triangulate data from three different surveys. Therefore three statistical analyses were performed, separately for each survey. Calculations were carried out using the software Statistica 13.3.

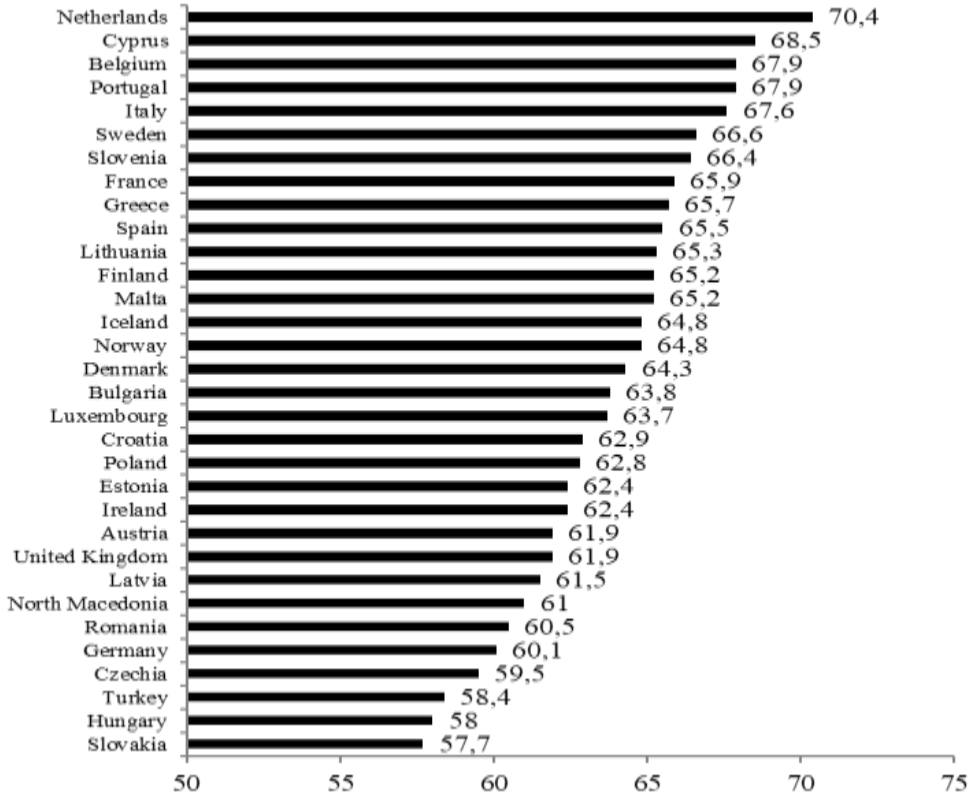
4. Results

4.1 Eurobarometer

The mean OAT is 63.8, with a large variation between countries (SD=3.2). A detailed distribution of results presents Figure 1. The maximum value is in the Netherlands (70.4), and the minimum is in Slovakia (57.7). The distance between these extremes is almost 13 years.

Table 2 contains correlation coefficients between a dependent variable (OAT) and independent variables. Insignificant ($p > 0,05$) dependency was found for level of life (GDP per capita), inequality (Gini index), late-life labor force participation (among both 60-64 and 65+), institutional settings (retirement age), and most (5 out of 6) cultural factors. Significant dependency, in turn, was found for seven variables: quality of life (Human Development Index), all demographic (share of aged 65+, median age, old-age dependency ratio), and health factors (healthy life expectancy at the age of 60, and total expenditures on health), and one cultural factor (Masculinity versus Feminism).

Figure 1. *Country-level perception (average) of old-age threshold, by Eurobarometer (2011).*



Source: *Own elaboration based on Eurobarometer data.*

The strength of the relationship is the greatest in case of healthy life expectancy at the age of 60 and in case of health expenditures. Both of these correlations are positive. It means that as the late-life expectancy in good health is longer, and as the spendings on healthcare are higher, the higher is the age considered to be the onset of old age. Similarly with HDI and demographic situation, in countries where the process of population aging is more advanced (higher: share of aged 65+, dependency ratio, or median age), as well as the process of human development is more advanced (higher HDI), the old-age threshold is being perceived higher. The only variable with negative correlation is a cultural factor in dimension Masculinity versus Femininity[3]. With an increase of that score across countries, the onset of old age is seen (in average) as lower.

[3]*Masculinity versus Feminity (MAS) dimension of culture inform about the orientation of society towards either "tough" (achievement, heroism, assertiveness, and material rewards for success) or "tender" (preference for cooperation, modesty, caring for the weak and quality of life) aspects of culture. A high score (Masculine) on this dimension indicates that*

Table 2. *Correlation matrix, Eurobarometer (2011).*

Variable	OAT
HDI	**0,447**
GDP	0,304
Gini	-0,171
LFPR 60-64	0,19
LFPR 65+	0,008
SHARE65+	**0,414**
OADR	**0,451**
MA	**0,402**
HALE	**0,59**
EXPEND	**0,539**
PDI	-0,19
IDV	0,092
MAS	**-0,496**
UAI	0,185
LTO	-0,146
IVR	0,232
RA	0,241
Marked correlations are significant at p < ,05	

Source: *Own elaboration.*

Table 3 contains the estimation results of the multiple regression model. It includes three predictors: health factor (HALE), cultural factor (MAS), and demographic factor (MA). The coefficient of determination (adjusted R-square) is 0,59, so those three variables predict 59% variability of the dependent variable (OAT).

Table 3. *Estimation results of the multiple regression model, Eurobarometer (2011)*

N=31	β	Std.Err. of β	b	Std.Err. of b	t(27)	p-value
Intercept			**36,61**	**5,93**	**6,18**	**0,00**
HALE	**0,50**	**0,12**	**1,06**	**0,25**	**4,21**	**0,00**
MAS	**-0,44**	**0,12**	**-0,06**	**0,02**	**-3,76**	**0,00**
MA	**0,28**	**0,12**	**0,29**	**0,12**	**2,39**	**0,02**
Regression Summary for Dependent Variable: OAT R= 0,8 R^2= ,63 Adjusted R^2= ,59 F(3,27)=15,34 p < ,00001 Std.Error of estimate: 2,0						

Source: *Own elaboration.*

The impact is the greatest (β=0,5) in case of healthy life expectancy at the age of 60 (HALE). An increase of that factor across nations by 1-year causes, if all other

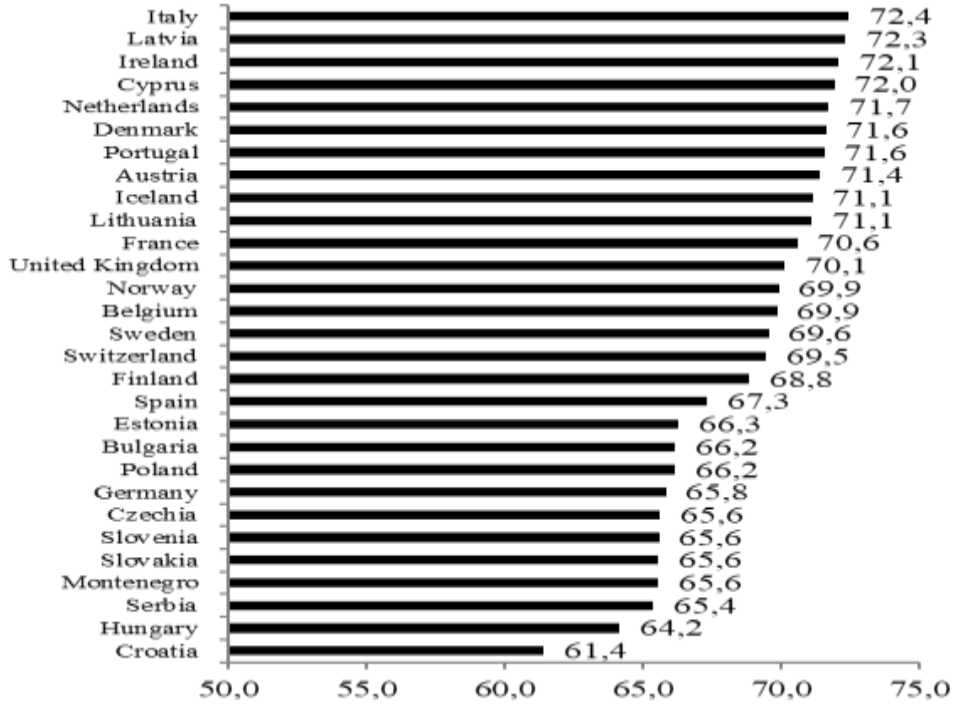
society is more likely to be driven by "tough" values and norms, whereas low score (Feminine) means that in society dominate "tender" values and norms.

variables are stable, over 1 year (b=1,06) increase of overall (average in population) age that is considered as an onset of old age. Regarding MAS, a one-point increase in Masculinity versus Femininity score causes, ceteris paribus, only minimal (b=-0,06) decrease of OAT. The impact of MA is the lowest. An increase in median age across countries by 1-year causes, ceteris paribus, increase of OAT by almost one-third year (b=0,29).

4.2 European Social Survey

The mean of OAT is 68.7, with a large variation between countries (SD=3). A detailed distribution of results presents Figure 2. The maximum value is in Italy (72.4), and the minimum is in Croatia (61.4). The distance between these extremes is over 10 years.

Figure 2. *Country-level perception (average) of old-age threshold, by ESS (2018).*



Source: *Own elaboration based on ESS data.*

Table 4 contains correlation coefficients between the dependent variable (OAT) and dependent variables. Significant ($p < 0,05$) dependency was found for six variables: quality of life (Human Development Index), late-life (60-64) labor-force participation, institutional settings (retirement age), and two cultural factors (Power Distance Index, and Individualism versus Collectivism).

The strength of the relationship is the greatest in case of healthy life expectancy at the age of 60. This correlation is positive, just like in case of retirement age and labor-force participation. As those factors are higher across countries, the old-age threshold is being perceived higher. Regarding to cultural factors: in one case (PDI[4]) correlation is negative, and in the other (IDV[5]) is positive.

Table 4. *Correlation matrix, ESS (2018).*

Variable	OAT
HDI	**0,51**
GDP	0,26
Gini	0,08
LFPR 60-64	**0,44**
LFPR 65+	0,34
SHARE65+	0,02
OADR	0,09
MA	-0,06
HALE	**0,56**
EXPEND	0,31
PDI	**-0,55**
IDV	**0,46**
MAS	-0,26
UAI	-0,28
LTO	-0,25
IVR	0,33
RA	**0,41**
Marked correlations are significant at p < ,05	

Source: *Own elaboration.*

Table 5 contains the estimation results of the multiple regression model. It includes two predictors: health factor (HALE) and cultural factor (PDI). The coefficient of determination (adjusted R-square) is 0,37, so those two variables predict 37% variability of the dependent variable (OAT).

[4]*Power Distance Index (PDI) dimension of culture reveals the extent to which the less powerful members of society expect and accept the power is distributed unequally. The higher is score in this dimension, the more hierarchical and more unequal society is.*

[5]*Individualism versus Collectivism (IDV) dimension of culture refers to the strength of the ties that people have to others within their community. The higher is score in this dimension, the more "individual" is society, and less "collective". Individualism is defined here as a preference for a loosely-knit social framework in which individuals are expected to take care only themselves and their immediate families. Collectivism, in turn, is a preference for a tightly-knit framework in society in which individuals may expect other society members to look after them in exchange for unquestioning loyalty.*

Table 5. *Estimation results of the multiple regression model, ESS (2018)*

N=28	β	Std.Err. of β	b	Std.Err. of b	t(27)	p-value
Intercept			**57,58**	**6,83**	**8,44**	**0,00**
HALE	**0,38**	**0,17**	**0,76**	**0,35**	**2,18**	**0,04**
PDI	**-0,37**	**0,17**	**-0,05**	**0,02**	**-2,15**	**0,04**
Regression Summary for Dependent Variable: OAT R= 0,65 R^2= 0,42 Adjusted R^2= 0,37 F(2, 25) = 8,94 p < ,00118 Std. Error of estimate: 2,39						

Source: *Own elaboration.*

An increase in healthy life expectancy at the age of 60 by 1 year across countries causes, if the other variable is stable, an increase of OAT by 9 months (b = 0,76). As for PDI, a one-point rise in that score causes just a minimal (b = -0,05) decrease of OAT.

4.3 Ipsos

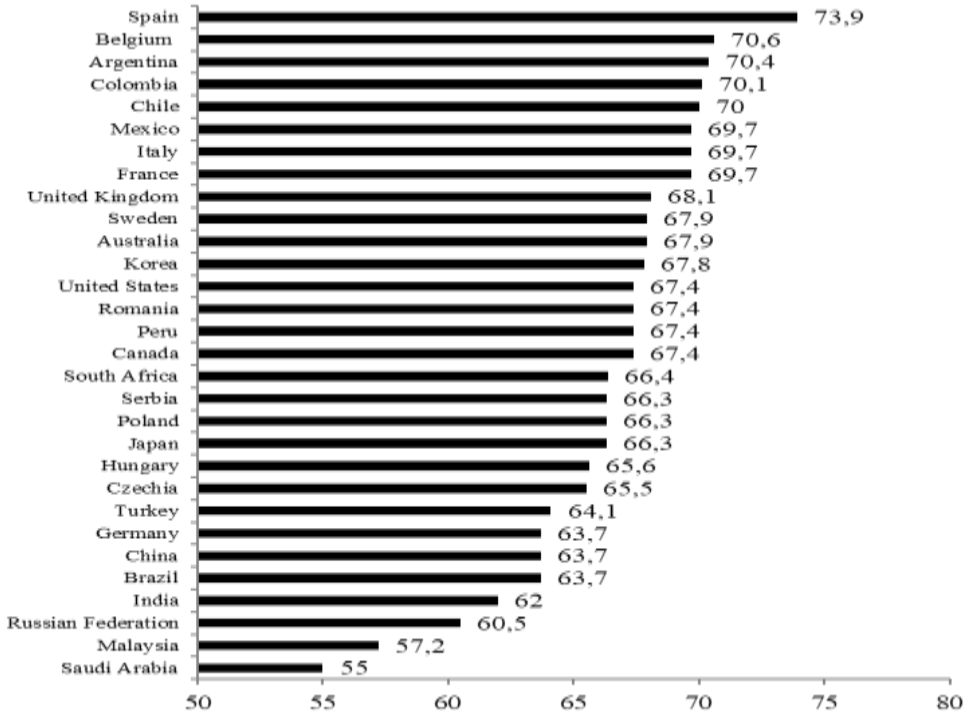
The mean OAT is 66.4, with a large variation between countries (SD=4). A detailed distribution of results presents Figure 3. The maximum value is in Spain (73.9), and the minimum is in Saudi Arabia (55). The distance between these extremes is almost 19 years.

Table 6 contains correlation coefficients between the dependent variable (OAT) and independent variables. Insignificant (p > 0,05) dependency was found for: quality of life (HDI), level of life (GDP per capita), inequality (Gini index), late-life labor-force participation (among both: 60-64 and 65+), one demographic factor (ME), and most (5 out of 6) cultural factors. Significant dependency, in turn, was found for six variables: two demographic factors (share of 65+, and old-age dependency ratio), all health factors (healthy life expectancy at the age of 60, and total expenditures on health), institutional factor (retirement age), and one cultural factor (Power Distance Index).

The strength of the relationship is the greatest in case of healthy life expectancy at the age of 60, and also in case of retirement age. Both of these correlations are positive, so as they are higher across countries, the old-age threshold is perceived higher, similarly, with demographic factors and health spending. The only variable with a negative correlation is a cultural factor.

Table 7 contains the estimation results of the multiple regression model. It includes two predictors: health factor (HALE) and institutional factor (RA). The coefficient of determination (adjusted R-square) is 0,47, so those three variables predict 47% variability of the dependent variable (OAT).

Figure 3. *Country-level perception (average) of old-age threshold, by Ipsos (2018).*



Source: *Own elaboration based on Ipsos data.*

Table 6. *Correlation matrix, Ipsos (2018).*

Variable	OAT
HDI	0,30
GDP	0,29
Gini	-0,13
LFPR 60-64	0,32
LFPR 65+	-0,05
SHARE65+	**0,42**
OADR	**0,41**
MA	0,30
HALE	**0,61**
EXPEND	**0,38**
PDI	**-0,50**
IDV	0,25
MAS	-0,07
UAI	0,24
LTO	-0,14
IVR	0,27

RA	**0,60**
Marked correlations are significant at p < ,05	

Source: *Own elaboration.*

Table 7. *Estimation results of the multiple regression model, Ipsos (2018)*

N=30	β	Std.Err. of β	b	Std.Err. of b	t(27)	p-value
Intercept			16,09	11,76	1,37	0,18
HALE	**0,43**	**0,15**	**0,85**	**0,30**	**2,82**	**0,01**
RA	**0,41**	**0,15**	**0,57**	**0,21**	**2,73**	**0,01**
Regression Summary for Dependent Variable: OAT R = 0,71 R^2 = 0,51 Adjusted R^2= 0,47 F(2, 27) = 13,83 p <, 00007 Std. Error of estimate: 2,90						

Source: *Own elaboration.*

The impact is the greatest (β=0,5) in case of HALE. An increase of healthy life expectancy at the age of 60 by 1 year across countries causes, if the other variable is stable, an increase in perception of OAT by 0,85 year (b=0,85). Regarding retirement age, its increase by 1 year across countries causes, ceteris paribus, increase in perception of OAT by over half year (b = 0,57).

5. Conclusions

Perception of the old-age threshold varies from country to country. Among countries where surveys were conducted, it is the lowest in Saudi Arabia (Ipsos survey) and the highest in Spain (also Ipsos survey). Residents of Saudi Arabia perceive (on average) the onset of old age at the age of 55, whereas residents of Spain at the age of 73,9. Macro-level factors significantly correlated with this variability are presented in table 8.

Table 8. *Macro-level factors significantly correlated with variability of the old-age threshold perception: comparison of different surveys.*

Eurobarometer	**European Social Survey**	**Ipsos**
HDI (+)	HDI (+)	SHARE 65+ (+)
SHARE 65+ (+)	LFPR 60-64 (+)	OADR (+)
OADR (+)	HALE	HALE (+)
MA (+)	PDI (+)	EXPEND (+)
HALE (+)	IDV (-)	PDI (-)
EXPEND (+)	RA (+)	RA (+)
MAS (-)		

Source: *Own elaboration.*

The only macro-factor that appears in all three surveys is HALE - healthy life expectancy at the age of 60. It confirms that health is of key importance for the perception of the old-age threshold. An increase of this factor across countries results in almost the same (Eurobarometer) or a little lower (ESS, Ipsos) increase of

age that is considered as an onset of old age. However, this predictor is derived from many other factors that are (directly or indirectly) related to the modernization process. Long and healthy life is a clear symptom of high technological, social, and economic development.

The demographic situation, and more precisely, the advancement of the population aging process, is also of great importance for the perception of the old-age threshold. In countries where the median age is higher, the onset of old age is perceived as higher. Since older people tend to perceive the old-age threshold higher than younger ones, it seems evident that change in the population's age composition causes a natural cohort effect. It is not, however, the only explanation. The psychological aspect of demographic change also may play a role.

Namely, people may express different attitudes toward old age depending on demographic context. It can be presumed that perception of old age, including its onset, may differ depending on whether a person in certain age lives in a very young population, with only a few aged people, or rather in a very old population, with very many elderlies. This is only a supposition that requires further empirical verification.

Institutional settings (retirement legislation) are also crucial in shaping the perception of the old-age threshold. Higher retirement age results in higher age that is considered as an onset of old age. Despite it often does not designate the momentum of effective labor-force withdrawal (van Soest and Zaidi, 2015), it is still mentally associated with the threshold of old age. As for the limitations of our study, three main issues should be pointed out.

First of all, cross-sectional data, as analyzed here, gives information about situation in a certain point in time and has no regard to changes over time. It provides, however, some suggestions, how such changes may take place. It can be presumed then that with lengthening life in good health, the starting point of old age will be perceived higher. The same with an increase in median age and a rise in retirement age.

Secondly, the limitation is a relatively small sample of countries (Eurobarometer: 32; ESS: 29; Ipsos: 31), so that statistical models may be affected by randomly deviated cases. Moreover, it is not allowed to generalize conclusions for all countries.

Thirdly, we analyzed the impact of macro-level variables (contextual factors) on the average (in-country) perception of the old-age threshold, excluding variability of micro-level factors (personal characteristics). In this case, multilevel modeling would be more appropriate but was not possible to conduct due to a lack of sufficiently detailed data.

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