



UNIVERSITÀ  
DEGLI STUDI  
DI PADOVA

# UNIVERSITÀ DEGLI STUDI DI PADOVA

## Graduate School of Economics and Management

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Social Determinants of Economic Behavior of Older Adults in  
Europe

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Three essays based on SHARE micro-data survey

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**This collection of essays constitutes a thesis in the framework of the Doctor of  
Philosophy Program**

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Supervisor: Professor Guglielmo Weber

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## *General Introduction*

This PhD thesis contributes to the growing economic literature which studies effects of social and cultural variables on economic behavior of older adults in Europe. Landes, cited in Guiso *et al.* (2006), states that "if we learn anything from the history of economic development, it is that culture makes all the difference" (p. 29). Indeed, in the recent years economists put an effort to apply their analytical frameworks and empirical tools to study the role of culture on economic outcomes (Guiso *et al.*, 2006). Many studies have already linked economic outcomes directly to cultural differences. In my papers I use *culture* as it is defined by Guiso *et al.* (2006). This definition is focused only on such aspects of culture (beliefs, values or skills) that are *inherited* by an individual from the previous generations ("transmitted fairly unchanged from generation to generation") of his or her social group (p. 23). The persistence of these "slow-moving" components of culture allows us to use such variables as ethnic origin or culture inherited from the family of origin as exogenous predictors of economic outcomes, thus avoiding the issue of reverse causality. In my study I rely in particular on the assumption of Bisin and Verdier (2000), who maintain that parents have a natural tendency to teach their children what they have learned from their own parents, usually without an appropriate assessment of adequacy of this education.

Referring to Cunha and Heckman, Mazzonna (2011) states that a vast body of theoretical and empirical literature already showed that the formation of cognitive and socio-emotional skills is a function of the transfers from the family of origin (e.g. cognitive ability, physical appearance, attitudes, and family connections as well as cultural traits). In the next step it has been already shown that these transfers are a key determinant of the economic success of children at an adult age (Mazzonna 2014: 26). The three current papers take this claim one step further and show that the effect of these transfers go far beyond the adult outcomes to influence the older adults' economic performance. These papers, therefore, might be regarded as a contribution to the life course approach studies, where controlling for the current social and economic variables, one looks at the effects of the inherited culture on older adult's economic behavior.

To study this process I use the Survey on Health, Aging and Retirement in Europe (SHARE). SHARE is a multidisciplinary and cross-national panel database, which collects detailed micro data on health, socio-economic status and social and family networks of more than 85,000 individuals (approximately 150,000 interviews) from 20 European countries (+Israel) aged 50 or over. At the time of writing this thesis, 4 waves of this longitudinal study became available. These waves extend from 2004 to 2012 and are supplemented by the life histories that were collected in Wave 3 (SHARELIFE) and which provide background information as far back in time as childhood health and socio-economic status. Together, SHARE and SHARELIFE provide a wealth of data to address relevant for my study questions (see Börsch-Supan *et al.*, 2013). For example, I examine whether disparities in early-life endowments correlate with older people's proclivity to engage in unpaid 'productive activities' (such as volunteering or informal help). Whether norms, transmitted inside families, help older parents (who make monetary transfers to their grown-up children) to estimate the risk with which the child will renege on created "nonguaranteed debt?" Finally, I study, whether belonging to a linguistic community in Europe matters in determining the participation of older adults in the financial market. Regarding the last question, I rely on the assumption that "language and culture constitute one another, with language being the stable factor that constrains the development of cultural norms" (Licht *et al.*, 2007: 661).

The first paper is entitled *Early-Life Conditions and Unpaid Productive Involvement at the Age 65 and Older in European Countries*. It studies relationships between disparities in early-life conditions and extent and intensity of unpaid productive involvement among people aged 65 and older. The suggested measures of early-life conditions are "cultural capital" of the family of origin, mathematical ability and historical and institutional circumstances, such as experiencing an institutionally caused traumatic event during childhood. The paper uses data from SHARE wave 2 and SHARELIFE. The results confirm that, even after accounting for many other individual-level variables, there exist long-lasting correlations between some of the early-life conditions and involvement in the unpaid productive activities in the old age.

The second paper, *Uncertainty in Private Inter-Generational Transfers of Money and Time*, contributes to the burgeoning literature on private downward intergenerational transfers of money and time in the Western countries. Building on the research, which finds support for the exchange motive of such transfers, this study further investigates determinants of the parental decision to transfer money. The empirical analysis is based on variables from three waves of SHARE, 14,889 parent-child dyads from 12 European countries. After discussing the risky nature of the exchange, I find that this decision to transfer money is dependent on the measures of current and childhood social status of the parents. This is congruent with the findings in the literature on trust that people from higher social status are less likely to be cheated; and that the people, who expect less to be cheated, are more willing to participate in risky transactions. This finding suggests that the parental decision to transfer money is determined by estimated uncertainty regarding the likelihood that the financial transfer will be reciprocated by children, who are expected to provide services later in life. Moreover, the study supplies an empirical support for the idea that this decision is informed by parental knowledge about the cultural norms characterizing their family.

Finally, the third paper, *Linguistic Communities and Financial Behavior of Older Adults in Europe*, compares financial behavior (holding stocks, bonds, mutual funds and/or individual retirement accounts (IRA)) of older adults, belonging to 10 different European linguistic communities: German-speakers in South Germany, German-speakers in Austria and in Switzerland; Italian-speakers in Northern Italy and those in Switzerland; French-speakers in East France, in Belgium and in Switzerland; and finally Dutch in the Netherlands and Flemish in Belgium. Previous research found profound differences in financial behavior among older adults across European countries. However, belonging to different linguistic groups in a country; or to the same linguistic group across different countries was usually neglected as a possible predictor of financial behavior. Recently many other noneconomic factors were found as important determinants of the household financial behavior of older adults, such as effects of social institutions and culture. However, the literature has missed the fact that belonging to different linguistic communities in Europe might serve as a proxy for a latent construct of having/lacking skills and values that are necessary for holding stocks, bonds, mutual funds and/or

individual retirement accounts. Using the fourth wave of SHARE, I find first that for three kinds of financial instruments (holding stocks, risky assets and risky assets plus IRA) – after controlling for all possible determinants of private financial market participation – the behavior of the three linguistic communities in Switzerland and of the two communities in Belgium isn't the same, despite they face identical institutions. Second, in some cases (especially, concerning the French-speakers), the financial behavior of a language speaker can be identical, even when facing heterogeneous financial environment (i.e. the behavior is identical across countries). Thus, it is evident that language matters for private financial decisions – at least for some of the major European linguistic groups – even after controlling for a wide range of adequate variables.

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## *Introduzione*

(La traduzione non è perfetta perché non parlo l'italiano)

Questa tesi di dottorato offre un contributo alla sempre più crescente letteratura economica che studia gli effetti delle variabili di tipo sociale e culturale sul comportamento economico degli adulti anziani in Europa. Landes, citato in Guiso *et al.* (2006), afferma che “se possiamo apprendere qualcosa dalla storia dello sviluppo economico, è che la cultura fa tutta la differenza” (pag. 29). In effetti, in questi ultimi anni gli economisti stanno cercando di applicare i loro quadri teorici di analisi e i rispettivi strumenti empirici per studiare il ruolo della cultura sugli effetti economici (Guiso *et al.*, 2006). Molti studi hanno già direttamente collegato gli effetti economici alle differenze culturali. Nei miei paper utilizzo il termine *cultura* così come viene definito da Guiso *et al.* (2006). Questa definizione si sofferma solo su quegli aspetti della cultura (credenze, valori o capacità) che vengono ereditati da un individuo dalle generazioni precedenti (“trasmessi in modo relativamente immutato di generazione in generazione”) del proprio gruppo sociale (pag. 23). La persistenza di queste componenti “rallentate” della cultura ci permette di utilizzare variabili come l'origine etnica o la cultura ereditata dalla famiglia di origine come elementi predittori di natura esogena degli effetti economici, evitando così la questione della causalità inversa. Nel mio studio mi affido in particolare all'ipotesi di Bisin e Verdier (2000), che sostengono che i genitori hanno una naturale tendenza ad insegnare ai loro figli ciò che hanno imparato dai propri genitori, di solito senza un'adeguata valutazione dell'adeguatezza di questa educazione.

Riferendosi a Cunha e Heckman, Mazzonna (2011) afferma che una vasta letteratura teorica ed empirica ha già dimostrato che la formazione di abilità cognitive e socio-emotive dipende dalle eredità della famiglia di origine (ad esempio, le abilità cognitive, l'aspetto fisico, le abitudini, i legami familiari, nonché i tratti culturali e genetici). Nel successivo sviluppo di queste tesi, è stato già dimostrato che queste eredità sono un fattore determinante del successo economico e sociale dei bambini quando arrivano all'età adulta (Mazzonna 2014: 26). Questi tre paper fanno fare a questa affermazione un ulteriore passo avanti, poiché dimostrano che il risultato di queste eredità va ben oltre l'effetto sull'età adulta, arrivando ad influenzare il comportamento economico degli

adulti anziani. Questi paper, quindi, potrebbero essere considerati come un contributo agli studi che utilizzano un approccio mirato all'intero ciclo di vita, in cui attraverso il controllo delle variabili sociali ed economiche contemporanee, si guarda agli effetti della cultura ereditata sul comportamento economico degli adulti più anziani.

Per studiare questo processo, utilizzo l'Indagine su Salute, Invecchiamento e Pensioni in Europa (SHARE - *Survey on Health, Aging and Retirement in Europe*). SHARE è una banca dati multidisciplinare e multipaese che raccoglie dati individuali su salute, status socio-economico e relazioni sociali e familiari di più di 85.000 individui ultracinquantenni (raccolti approssimativamente attraverso 150.000 interviste) di 20 paesi europei (più Israele). Al momento di scrivere la mia tesi, 4 serie di questa ricerca longitudinale erano disponibili. Queste serie vanno ora dal 2004 al 2012 e sono integrate dalle storie di vita che sono state raccolte durante la terza rilevazione (denominata SHARELIFE), che forniscono informazioni retrospettive che risalgono alla salute e allo status economico nel periodo dell'infanzia. Insieme, SHARE e SHARELIFE rappresentano un importante patrimonio di dati per poter affrontare le mie questioni di ricerca (vedi Börsch-Supan et al., 2013). Ad esempio, è per me possibile studiare se le disparità nei mezzi a disposizione nei primi anni di vita siano correlate con la propensione degli anziani di impegnarsi in "attività produttive" (come, ad esempio, il volontariato o l'aiuto di natura informale). Se le norme trasmesse all'interno delle famiglie aiutino i genitori anziani (che procurano un reddito ai propri figli ormai adulti) a stimare il rischio che il figlio si sottrarrà alla restituzione di questo "debito non garantito". In ultima analisi, se l'appartenenza ad una comunità linguistica in Europa sia importante nel determinare la partecipazione degli adulti anziani al mercato finanziario. Relativamente a quest'ultima domanda, mi baso sul presupposto che "la lingua e la cultura si compongono l'una dell'altra, poiché la lingua è il fattore costante che vincola lo sviluppo di norme culturali" (Licht et al, 2007: 661).

"Condizioni personali nelle fasi iniziali della vita e la partecipazione in attività produttive non remunerate dai 65 anni in poi". Il primo articolo studia le relazioni tra le disparità esistenti nelle fasi iniziali della vita di una persona e l'entità e l'intensità di un suo successivo coinvolgimento in attività produttive non remunerate dai 65 anni in



poi. Si suggeriscono le seguenti misure delle condizioni personali di vita durante le sue prime fasi: il “capitale culturale” della famiglia di origine, le capacità matematiche dell'individuo e le circostanze storiche e istituzionali in cui egli si trova a vivere , come ad esempio la sua reazione ad un evento traumatico istituzionalmente causato durante l'infanzia. Questo articolo utilizza i dati del "Survey on Health, Aging and Retirement" per l'Europa (SHARE) e la sua indagine retrospettiva (SHARELIFE) in cui si raccolgono informazioni sul "background" familiare degli intervistati durante la loro infanzia in 13 paesi europei. I risultati confermano che, anche dopo aver considerato molte altre variabili a livello individuale, esistono correlazioni di lunga durata tra alcune delle condizioni delle prime fasi di vita di una persona e il suo coinvolgimento in attività produttive non retribuite durante vecchiaia.

“Incertezza nei trasferimenti intergenerazionali privati di tempo e denaro”. Il secondo articolo intende offrire un contributo alla fiorente letteratura sui trasferimenti intergenerazionali "verso il basso" di tempo e denaro, ossia dagli adulti ai giovani, nei paesi occidentali. Sulla base della ricerca preesistente che supporta motivazioni di scambio tra le vecchie e le nuove generazioni, questo studio intende indagare ulteriormente sulle determinanti della decisione dei genitori di trasferire denaro ai propri figli. L'analisi empirica si basa sulle variabili delle tre ondate di indagine del "Survey of Health, Ageing and Retirement in Europe" (SHARE, 14.889 diadi di genitori-figli di 12 paesi europei). Dopo aver discusso la natura rischiosa dello scambio intergenerazionale, si trova evidenza empirica che questa decisione dipende dalle misure dello status sociale corrente e dell'infanzia dei genitori. Questo risultato è congruente con i risultati della letteratura esistente secondo cui la gente di alto status sociale ha fiducia di avere meno probabilità di essere truffata e secondo cui la gente che si aspetta meno di essere truffata è più disposta a partecipare a operazioni rischiose. Tale scoperta suggerisce che la decisione dei genitori di trasferire denaro ai figli sia determinata dalla stima dell'incertezza circa la possibilità che il trasferimento finanziario sia da loro ricambiato, in quanto ci si aspetta che siano i figli a dover fornire dei servizi ai propri genitori durante la vecchiaia. Inoltre questo studio fornisce supporto empirico all'idea che tale decisione dei genitori è consapevolmente determinata dalle norme culturali che caratterizzano la propria famiglia.

“Comunità linguistiche e comportamento finanziario degli adulti più anziani in Europa”. Infine il terzo articolo confronta il comportamento finanziario (possesso di azioni, obbligazioni, fondi comuni di investimento e / o conti pensionistici individuali (IRA, ossia "Individual Retirement Accounts")) degli adulti più anziani appartenenti a 10 diverse comunità linguistiche europee. Si prendono in considerazione le comunità di lingua tedesca in Germania meridionale, in Austria e in Svizzera; quelle Italofone nel Nord Italia e in Svizzera; quelle Francofone nella Francia orientale, in Belgio e in Svizzera; ed infine quelle di lingua olandese nei Paesi Bassi e di lingua fiamminga in Belgio. Le ricerche precedenti hanno evidenziato profonde differenze nel comportamento finanziario degli adulti più anziani nei diversi paesi europei. Tuttavia tali studi hanno trascurato di considerare l'appartenenza a diversi gruppi linguistici in uno stesso paese; o allo stesso gruppo linguistico in diversi paesi, come possibile variabile previsiva del comportamento finanziario degli individui. Recentemente altre ricerche hanno individuato molti altri fattori non economici rilevanti nel determinare il comportamento finanziario familiare degli adulti più anziani, come l'influenza che su di loro hanno le istituzioni sociali e la cultura. Tuttavia in letteratura non si è considerato il fatto che l'appartenenza a diverse comunità linguistiche in Europa potrebbe essere assunta come variabile "proxy" di un fattore latente, quale potrebbe essere il possedere o meno le capacità e le competenze per detenere azioni, obbligazioni, fondi comuni di investimento e / o conti pensionistici individuali. In questo lavoro si trova, dopo aver effettuato un controllo per tutte le possibili determinanti della partecipazione privata nei mercati finanziari, che per tre tipi di strumenti finanziari (azioni, attività rischiose e attività rischiose aggiunte agli "IRA"), il comportamento delle tre comunità linguistiche in Svizzera e delle due comunità in Belgio non è lo stesso, nonostante ciascuna di esse abbia a che fare con istituzioni identiche. In secondo luogo, in alcuni casi (specialmente per quanto riguarda i francofoni), le modalità della partecipazione ai mercati finanziari di chi parla la stessa lingua possono essere identiche anche quando il contesto finanziario è eterogeneo, in altri termini si ha un comportamento finanziario identico da parte di chi appartiene alla stessa comunità linguistica ma vive in paesi diversi. Risulta quindi evidente da questa analisi empirica che la lingua parlata, anche dopo aver controllato per

una vasta gamma di variabili adeguate, è rilevante per le decisioni finanziarie private almeno per alcuni dei principali gruppi linguistici europei.

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# Paper 1. Early-Life Conditions and Unpaid Productive Involvement at the Age 65 and Older in European Countries

## Table of Contents

	<b>Section</b>	<b>Page</b>
	ABSTRACT	2
	1. Introduction	3
	2. The Concept of Productive Aging and its Measures	5
	3. Theoretical Framework	6
	3.1 Early-Life Determinants of Economic Behavior	7
	3.2 Other Predictors of Older Adult's Productivity already Identified in the Literature	9
	4. Data and Variables	10
	4.1 Dependent Variables	12
	4.2 Independent Variables	14
	5. Empirical Results	18
	5.1 Descriptive Statistics	19
	5.2 Bivariate Associations	24
	5.3 Multivariate Analyses	29
	5.4 Estimation Results	30
	5.4.1 Ordered Probit for the Number of Unpaid Productive Activities	30
	5.4.2 TOBIT regression for the Intensity of Unpaid Productive Activities	37
	6. Discussion	42
	References	48
	Appendix: RE-DEFINING THE MODEL	51

## List of Tables

<b>Table</b>	<b>Page</b>
Table 1. Distribution of the <b>Number</b> of Productive Activities, Respondents 65+	19
Table 2. Summary Statics, Subsample of 65 and older	22
Table 3. Giving Help inside the Household, by Own Health Status and by the Health Status of the Spouse	24
Table 4. Number of Productive Activities, by Age Group and Self-Reported Health, Respondents 65+ (in percentage)	25
Table 5. Bivariate Associations between the Two Productive Outcomes and the Study Variables: Spearman's rho, Respondents 65+	26
Table 6. Ordered Probit regression for <b>Number</b> of Unpaid Productive Activities for Respondents aged 65+	31
Table 7. TOBIT regression for <b>Intensity</b> of Productive Activities for Respondents aged 65+	38
Table 8. Ordered Probit for Parental Occupations	52

## List of Figures and Charts

<b>Figure/Chart</b>	<b>Page</b>
Figure 1. Life-Course. Four Stages of Life	6
Chart 1. Unpaid Productivity. 65+ Subsample	20
Chart 2. Distribution of the hours invested in Productive activities by the Respondents 65+	21
Chart 3. Mean of Number of Productive Activities at 65+, by number of Books at home at age 10. <b>Sample 65+</b>	27
Chart 4. Mean of Number of Productive Activities at 65+, by number of Books at home at age 10. <b>Male</b> Subsample 65+	28
Chart 5. Mean of Number of Productive Activities at 65+, by number of Books at home at age 10. <b>Female</b> Subsample 65+	28

# Paper 2. Uncertainty in Private Inter-Generational Transfers of Money and Time

## Table of Contents

	<b>Section</b>	<b>Page</b>
Abstract		1
1. Introduction		2
2. Theory: A Model of Private Transfers		4
3. The Decision to Transfer Money under Exchange: Introducing Uncertainty		6
4. Analytical Strategy		8
5. Data, Variables and Descriptive Statistics		9
5.1. Dependent Variables		11
5.2 Independent Variables		11
6. Multivariate Analysis		13
7. Discussion		17
References		20

## List of Tables

	<b>Table</b>	<b>Page</b>
Table 1. Descriptive Statistics		12
Table 2. The Heckman Selection Procedure		13

# Paper 3. Linguistic Communities and Financial Behavior of Older Adults in Europe

## Table of Contents

	<b>Section</b>	<b>Page</b>
ABSTRACT		2
1. Introduction		3
2. The Role of Linguistic Communities in Financial Behavior of Older Adults and the Research Question		5
2.1 Culture		6
2.1.1 Which specific cultural attributes are important for economic outcomes and Why?		7
2.1.2 Persistence of Culture?		9
2.2 Institutions		10
2.3 Institutions or Culture?		13
2.4 Why belonging to different Linguistic Community in Europe should matter?		15
2.5 Hypothesis and Research Question		18
3. Empirical Findings about Financial Instruments, Culture and Institutions		18
4. Other Variables Identified as Good Predictors of Stocks- or Bonds-holding		21
5. Data and Variables		23
5.1 Dependent Variables		26
5.2 Independent Variables		26
6. Results		29
6.1 Descriptive Statistics		29
6.2 Distribution of the Dependent and Selected Independent Variables by the Linguistic Communities		31
6. 2.1 Dependent Variables		31
6.2.2. Selected Preferences and Social or Cultural Characteristics		34
6.3. Empirical Strategy		35
6.4. Multivariate Analysis		37

<b>Section</b>	<b>Page</b>
1 <sup>st</sup> Outcome: Pure Stocks-Holding (direct and indirect)	37
2 <sup>nd</sup> Outcome: Risky Assets (holding stocks and/or bonds and/or mutual funds)	42
3 <sup>rd</sup> Outcome: Risky Assets (holding stocks and/or bonds and/or mutual funds) plus individual retirement accounts (IRA)	46
7. Discussion	52
References	62
APPENDIX I: Graphical Evidence: Selected Social and Cultural Variables by Linguistic Community	66
APPENDIX II: Full Linear Probability Models	71
APPENDIX III: Standard Errors clustered by Linguistic communities	86
APPENDIX IV: Probit	104

## List of Tables

<b>Table</b>	<b>Page</b>
Table 1. Pensions Systems in Several European Countries	11
Table 2. The Sample by Linguistic Community	26
Table 3. Descriptive Statistics	30
Table 4. Outcomes: Proportion of hhd's by Linguistic Community	33
Table 5. Outcomes: 3 kinds of financial behavior	35
Table 6. Description of the 4 Models	36
Table 7. Description of the LPM Procedure	37
Table 8: LPM. OLS. Pure Stocks-Holding (direct and indirect), 50+, HH's	39
Table 9: Graphical illustration for influence of the 4 Models on country (the upper plot in each panel) and linguistic communities' dummies (the lower plot in each panel), as deviations from South Germany and German-speakers in South Germany (respectively)	41
Table 10: OLS. Risky Assets (holding of stocks and bonds and/or mutual funds), 50+, HH's	43
Table 11: Graphical illustration for influence of the 4 Models on country (the upper plot in each panel) and linguistic communities' dummies (the lower plot in each panel), as deviations from South Germany and German-speakers in South Germany (respectively)	45
Table 12: OLS. Risky Assets plus IRA, 50+, HH's	47
Table 13: Graphical illustration for influence of the 4 Models on country (the upper plot	50



<b>Table</b>	<b>Page</b>
in each panel) and linguistic communities' dummies (the lower plot in each panel), as deviations from South Germany and German-speakers in South Germany (respectively)	
Table 15. Post-Estimation: Results of the F-Test for Equality of Language Interactions Dummies	51
Table 16. F-Test for Equality of Language Groups in Switzerland and Belgium, Same Results for all the three Outcomes: holding of Stocks, Risky Assets and Risky Assets plus IRA	52
APPENDIX II. Table 8: LPM. OLS. Pure Stocks-Holding (direct and indirect), 50+, HH's	71
APPENDIX II. Table 10: OLS. Risky Assets (holding of stocks and bonds and/or mutual funds), 50+, HH's	76
APPENDIX II. Table 12: OLS. Risky Assets plus IRA, 50+, HH's	81
APPENDIX III. Table 1: LPM. OLS. Pure Stocks-Holding (direct and indirect), 50+, HH's	86
APPENDIX III. Table 2: Graphical illustration for influence of the 4 Models on country (the upper plot) in each panel and linguistic communities' dummies (the lower plot), as deviations from South Germany and German-speakers in South Germany (respectively).	91
APPENDIX III. Table 3: OLS. Risky Assets (holding of stocks and bonds and/or mutual funds), 50+, HH's	92
APPENDIX III. Table 4: Graphical illustration for influence of the 4 Models on country (the upper plot) in each panel and linguistic communities' dummies (the lower plot), as deviations from South Germany and German-speakers in South Germany (respectively)	96
APPENDIX III. Table 5: OLS. Risky Assets plus IRA, 50+, HH's	97
APPENDIX III. Table 6: Graphical illustration for influence of the 4 Models on country (the upper plot) in each panel and linguistic communities' dummies (the lower plot), as deviations from South Germany and German-speakers in South Germany (respectively)	101
APPENDIX III. Table 7. Post-Estimation: Results of the F-Test for Equality of Language Interactions Dummies	102
APPENDIX III. Table 8. F-Test for Equality of Language Groups in Switzerland and Belgium, Same table for all the three Outcomes: holding of Stocks, Risky Assets and Risky Assets plus IRA	103
APPENDIX IV. Table 8: Probit. Pure Stocks-Holding (direct and indirect), 50+, HH's	104
APPENDIX IV. Table 10: Probit. Risky Assets (holding of stocks and bonds and/or mutual funds), 50+, HH's	109
APPENDIX IV. Table 12: Probit. Risky Assets plus IRA, 50+, HH's	113
APPENDIX IV. Table 13. Post-Estimation: Results of the F-Test for Equality of Language Interactions Dummies	117

<b>Table</b>	<b>Page</b>
APPENDIX IV. Table 15. F-Test for Equality of Language Groups in Switzerland and Belgium, Same table for all the three Outcomes: holding of Stocks, Risky Assets and Risky Assets plus IRA	118

## List of Figures

<b>Figure</b>	<b>Page</b>
Figure 1. Differences in Stock-Market Participation in Europe	6
Figure 2. Predominant Religions in Europe and Neighboring Regions	17
Figure 3. Nomenclature of Territorial Units for Statistics Classification (NUTS1)	25
Figure 4. Direct and Indirect Stock-holding	33
Figure 5. Holding of Risky Assets	33
Figure 6. Holding of Risky Assets or IRA	33
APPENDIX I. Figure 7. Proportion of HH's not willing to take any risk when saving or making investments	66
APPENDIX I. Figure 8. Proportion of HH's with volunteers or participants in a political/community organization. Last Year, where possible; otherwise, Last Month	67
APPENDIX I. Figure 9. Proportion of HH's with participants in a religious organization. Last Year, where possible; otherwise, Last Month	67
APPENDIX I. Figure 10. Proportion of HH's feeling that what happens is Rarely or Never out of their Control	68
APPENDIX I. Figure 11. Proportion of HH's saying feel that Life is Full of Opportunities, Sometimes or Often	68
APPENDIX I. Figure 12. Proportion of HH's saying feel that Future Looks Good, Sometimes or Often	69
APPENDIX I. Figure 13. Trust in God by Linguistic Community	70



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**Paper 1:**

**Early-Life Conditions and Unpaid Productive Involvement at the  
Age 65 and Older in European Countries**

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An Analysis Based on SHARE micro-data survey

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**By Iaroslav Youssim**

Supervisor: Professor Guglielmo Weber

ABSTRACT: This paper studies relationships between disparities in early-life conditions and extent and intensity of unpaid productive involvement among people aged 65 and older. The suggested measures of early-life conditions are “cultural capital” of the family of origin, mathematical ability and historical and institutional circumstances, such as experiencing an institutionally caused traumatic event during childhood. The paper uses data from SHARE wave 2 and SHARELIFE. The results confirm that, even after accounting for many other individual-level variables, there exist long-lasting correlations between some of the early-life conditions and involvement in the unpaid productive activities in the old age.

## 1. Introduction

The population ageing is recognized as perhaps the most important demographic, and thus also social, megatrend of our century. In recent decades, the notion of productive involvement among older adults has engendered much interest, especially in relation to the well-being of this age group (e.g. Butrica and Schaner 2005; Lum and Lightfoot 2005). The topic has also emerged in response to concern about the growing extent of possible risks that face social security systems, as a result of rising dependency ratios (e.g. Gruber and Wise 2001; Castles 2002).

The concept of ‘productive aging’ has been explored since by several scholars (e.g. Burr *et al.* 2007; Caro and Bass 1997; Erlinghagen and Hank 2006; Herzog and Morgan 1992). According to these authors, the perceived panic regarding the ‘burden of aging’ is somewhat overstated. That is, “a considerable amount of productivity occurs in the post-retirement years, albeit largely unpaid in nature” (Burr *et al.* 2007: S267). Retirement allows individuals to engage more in non-market production that can take various forms, such as volunteerism or informal caregiving. Moreover, it has been maintained that, “unlike labor force indicators, the unpaid productive activities... show much less decrease by age” (Erlinghagen and Hank 2006:568).

In order to clarify whether aging indeed poses potential threats to society as for example Gruber and Wise (2001 and 2005) claim, one needs to account for *a broader range of productive activities* performed by older citizens, and not only for their workforce participation (Baker *et al.* 2005; Van Der Meer 2006). This explains the attempts to quantify and to consider the human activities that previously remained outside the traditional market sphere (Herzog and Morgan 1992).

One aspect of productive activity in late life that has received little attention thus far is the relationship between different capitals (or resources) available to older individuals early in life and the extent, as well as the intensity (i.e. hours spent) of performing these activities in late life. Few studies have addressed whether disparities in accessibility to capitals over the life course correlates with older people’s capability of engaging in ‘productive activity,’ or answer the question, why some older people are more ‘productive’ than others. I address these questions by means of an empirical investigation. To the best of my knowledge, the current inquiry is the first to examine the extent to which the early-life social environment of older adults correlate with their overall engagement in a wide range of activities considered

to be productive, as well as with the intensity thereof. In particular, it sheds light on the importance of cultural transfers from the family of origin and other endowments, as well on the early-life influence of institutional environment.

It should be mentioned that Youssim *et al.* (2015) considered early-life conditions as determinants of volunteering among the older adults only in Israel and didn't use variables available for the European countries. They found that inheritance of work-relevant economic and cultural capitals from the family of origin is an important determinant of voluntarism (i.e. only one kind of productive activities) among adults aged 50 and older. In addition, Mazzonna (2014) looked at their influence on such economic outcomes as income, cognition and health. However, as follows from the discussion above, the question of considerable economic importance is identifying determinants of such outcomes as the *wide range of productive involvement* and *intensity* thereof. The current paper addresses this gap in the literature. Unlike Youssim *et al.* (2015), I study a wide range of productive activities (not only volunteering), as well as the time dedicated to them (Youssim *et al.* (2015) did not address the latter outcome and stated that this is a limitation of their study that must be addressed in further research). In addition, I look at the European countries (rather than Israel). Next, I use SHARELIFE database (again, Youssim *et al.* (2015) stated that another limitation of their study – that must be addressed in further research – is that wave 1 of SHARE provides only very limited information on respondents' parents and there is no information on a more refined measure of inherited cultural capital). Finally I restrict my sample to retirees (65 and older), rather than looking at the population aged 50 and older.

The rest of the paper is organized as follows. First, I present the concept of productive aging and discuss its measures. Then I elaborate on the theoretical framework and provide literature review. Next I describe the data and how the variables were constructed. This is followed by descriptive statistics and bivariate associations. I also show some graphical evidence about bivariate associations between the outcome and number of books at home, when 10. Subsequently, I perform multivariate analyses. The last chapter provides a discussion.

## 2. *The Concept of Productive Aging and its Measures*

Although there exists no commonly accepted definition of the phenomenon of ‘productive aging’ (Baker *et al.* 2005), there are four concepts that generally appear in the literature. The first includes only market activities (paid work). The second – and broader – definition includes activities performed outside the market, yet having economic value, such as formal social and civic contributions (volunteering, informal helping behavior or social assistance). The third parameter includes capacity-building (education, training). The fourth definition is the most inclusive, labeling self-directed action (maintaining oneself as independently as possible) as a kind of productivity (Baker *et al.* 2005; Hinterlong *et al.* 2001; Sherraden *et al.* 2001).

Baker *et al.* (2005) studied the consequences of involvement in productive activities on the personal well being of older people. They claim that there is a need to address both the range of activities and the time that people commit to them. Correspondingly, they used two separate indices. One represented the total number of productive activities in which respondents were involved, and the other estimated the amount of time commitment that respondents gave to all activities combined. The specific activities included in their measures were: paid work (regular/ irregular employment); volunteering (religious/ political/ educational/ senior group/ other); care-giving (acute or chronic care for friend/ relative/ neighbor); informal assistance (errands/ housework/ childcare/ other), and do-it-yourself activities (home improvement/ canning/ yard work/ car repair). In another attempt to quantify elderly people’s productivity, Glass *et al.* (1999) built an index which represents the sum of responses regarding subjects’ performance of the following activities in the preceding month: gardening, preparing meals, shopping, unpaid community work, paid community work and other paid employment.

In contrast, Herzog and Morgan (1992) question the approaches that simply count hours spent on such activities to measure a person’s productivity outside the marketplace. In their opinion, such approaches overlook the activity differentials that prevail among people. Thus, they maintain that study of productive behavior should include not only activities that produce valued goods and services, even if unpaid, but also the fact that not all productive activities are equally productive. In their paper, they propose methods to ascribe or to ‘impute’ fiscal values to behaviors that were traditionally outside the marketplace. In the

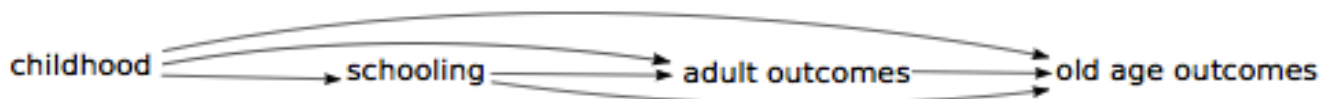
current paper I use measures of productive involvement similar to those, suggested by Baker *et al.* (2005).

### 3. Theoretical Framework

This study relies on an approach that became known as the *life-course perspective* (the LCP) (O'Rand 1996). According to this perspective, actors' attitudes and actions are a result not only of current social forces and individual resources but also of all the preceding life stages (Wong and DeGraff 2009). For LCP the increasing *inequality* of cohort members over time along significant life-course trajectories (e.g. health, work, or wealth) has become an important concern. Its theoretical and methodological concerns are especially focused on identifying the long-term interactions between institutional and life-course processes producing this outcome. Institutional mechanisms incorporated in opportunity structures such as labor markets and pensions stratify the availability of resources and rewards, and they interact with life-course processes related to labor force history and job mobility to produce complex patterns of cumulative advantage and cumulative disadvantage (O'Rand 1996: 230).

For example, in his investigation of the association between childhood socio-economic status and old age health, income and cognition, Mazzonna (2014) used a model (Figure 1), in which childhood circumstances may have both direct and indirect effects on old-age outcomes. Based on the idea of four stages of life (childhood, schooling, adulthood and the old age), there are a few possible pathways from childhood circumstances to old-age outcomes.

Figure 1. Life-Course. Four Stages of Life



In the current paper, I look at significance of the childhood variables, after accounting for the current life-chances. Unlike Mazzonna, I am interested only in the long-lasting effects of family background on the late-life productive involvement, rather than in its effect on



earlier outcomes. However, I introduce the earlier outcomes into my model, to identify whether measures of individuals' different socio-economic backgrounds are still strong and significant, even after controlling for proxies of school performance and adult outcomes.

In addition to taking the LCP approach, I also use a general model to explain older adults' productive involvement. Productive activities require resources (or "capital") to perform them. Therefore, a common finding is that older adults with a higher socioeconomic status, for example, exhibit a higher likelihood to engage in both paid and unpaid work (Youssim et al., 2015). I use a tripartite conceptual model of capitals needed to perform productive activities developed by Wilson and Musick (1997) to explain involvement in the volunteer activities. This model seems to be especially well suited to the sample of the population that I review (65 and older). As will be shown below, the vast majority of them does not participate in the labor market and are retired. For that reason, their productivity, as defined in this study, includes unpaid and optional activities and, therefore, may be treated as volunteerism. Wilson and Musick's model assumes that in order to engage in productive activities individuals require the following necessary resources: human and social capitals, as well as cultural tools. Although human and social capitals are commonly used determinants of economic outcomes, the third component requires an additional explanation. The following section explains its relevance as a resource for such an economic outcome as late-life productive involvement, as well as suggests a necessary modification of Wilson and Musick's (1997) model.

### *3.1 Early-Life Determinants of Economic Behavior*

Already in 1977 Vinson, Scott, and Lamont suggested that in every consumption taste matters and personal values affect consumption decisions. Guiso, Sapienza and Zingales (2006) state in general that in making many economic decisions (e.g. which college to attend, choice of a profession, saving for retirement) people's choices must be based on prior beliefs, which are determined by culture (e.g. by religion and ethnicity). Social and cultural variables reflect ways in which individuals are clustered into groups different with respect to owning of knowledge, skills and values, but also such as ethnicity or gender. In their book *Financial Theory and Corporate Policy*, Copeland, Weston and Shastri (2005) claim that individuals have different tastes for the time preference in consumption and different degrees of risk aversion. Social sciences, such as anthropology or sociology address these problems.

One well known example is Max Weber's book *The Protestant Ethics and the Spirit of Capitalism* (1958), which establishes that belonging to religious denominations matters for economic behavior. The capitalist ethic is informed by the Calvinist idea (as opposed to Catholic) about one's election (salvation), which is a function of such behaviors as **hard labor**, avoiding **enjoyment of wealth**, as well as **idleness**.

Wilson and Musick (1997) develop the idea posited by Bourdieu (1990), of cultural capital as a resource that is necessary for participation in volunteer activities. This form of capital consists of attitudes, knowledge and preferences. In their view the aspects of culture that are relevant for involvement in optional productive activities are values, such as being truthful, fair and responsible.

Yet, it is not undemanding for an empirical study to grasp **the cultural resources** or "the moral components" that are necessary for being a successful player in the field of 'productive aging.' According to Wilson (2000), children inherit their parents' volunteering habits, because the parents supply them with resources indispensable for volunteering. To assess the resources that a person owns at this cultural level, Wilson and Musick employ two measures: one directly measures how much the respondent values helping others; the second measures religiosity according to frequency of church attendance and of prayer (pp. 699, 703).

However do these measures adequately grasp habits, inherited from parents, which constitute the resources indispensable for the productive activities? Referring to Cunha and Heckman (2008), Mazzonna (2011) states that a vast body of theoretical and empirical literature suggests that cognitive and non-cognitive skills are formed by the interplay of the early childhood environment and genes. I claim that it is necessary to disentangle the resources inherited from the early-life milieu into three components: innate or genetic ability; the tools acquired from the environment, given by different native social milieus (e.g. family); and experiences, induced by the social structures, such as social norms or institutions. Hence I suggest modifying the last component in the Wilson and Musick (1997) model (i.e. the cultural capital). That is, the "cultural capital" (or the moral component of culture, inherited from parents) in Wilson and Musick (1997) model is supplemented with 2 more components, the genetic endowment and institutional circumstances.

The current study conjectures that the questions about **number of books in the house**, as well as **relative proficiency in the language when 10** capture in a finer manner availability of a native milieu-specific "tool-kit," which guarantees the permanence of their

socio-economic performances over time (Bourdieu 1990). These are better measures of the intergenerational transferred elite status, endowing with the superb moral qualities than those, proposed by Wilson and Musick. As to the number of books at home at the age of 10, it has been already used in the literature as a proxy for the cultural background” (Mazzonna, 2014:28; Brunello *et al.*, 2012). As to the language, Bourdieu viewed it as one of the main components of the cultural capital (Bourdieu 1986).

Finally, I suggest using the relative position in mathematics at 10 as a proxy for initial (or genetic) endowment. Unlike verbal abilities (which are mainly transferred from the early environment through education), the capability to compute and process numbers might be treated as reflecting personal genetic or biological idiosyncrasy. The historical and institutional circumstances are conceptualized as experiencing a traumatic event during childhood – which is arguably uncorrelated with the early familial milieu – such as “lived in a children's home,” “evacuated or relocated during a war,” “lived in a prisoner of war camp”. The institutional circumstances is also a function of the country of birth, under the assumption that in the data (to be described below) the country of interview is the same as the country of birth. Analyses in the appendix provide some empirical support for these assumptions.

### *3.2 Other Predictors of Older Adult's Productivity already Identified in the Literature*

In this section I review other resources (or capitals) that Wilson and Musick (1997) or other authors identified as important determinants of engaging in productive activities. At the individual level, the resources necessary are work-relevant skills and other means that a person brings to the job. This first set of resources is termed human capital, usually defined as educational achievements, occupational status, economic, and (sometimes) health indicators. Level of education is the most consistent predictor of engagement in volunteering activity (Wilson 2000).

According to Wilson (2000), economic status is also a predictor of involvement in productive activities, paid or unpaid. Volunteer hours are sometimes inversely related to wages because, as pay rises, people invest more resources in their paid job, leaving fewer resources for volunteering. However, he notes that other studies refute this contention,

showing that the effect of income on volunteering varies according to the method by which both are measured, and by the variables included in the model. Although in our case (respondents aged 65+) wage variable might be irrelevant, it seems to be reasonable to use some other indicator of the economic status. I use the disposable net-worth variable.

Health status also predicts productive involvement. First, it is well documented that poor health leads to an earlier exit from paid employment (Karpansalo *et al.* 2004; Lee 2005; Radl 2007; Schuring *et al.* 2007). Second, health status is also related to involvement in other forms of productive activity. According to Wilson and Musick (1997: 698), “The ability to do volunteer work, or to assist those in need of help, depends on one’s physical capabilities.”

In addition to the health status itself, I amend the model by introducing variables about individual life-style and health behavior, such as smoking or performing physical activities. Health-related behavior may or may be not a consequence of early life conditions, but if it is conceptualized as a health maintaining intervention, it should be taken into account, as a possible correlate of the old age productivity outcome. For example, the so called “model of additive exposure” (Berkman, Ertel, & Glymour, 2011) suggests that although early-life developmental phases are highly important throughout life, later circumstances may modify the effect of early-life conditions on the active aging. According to Tesch-Roemer (2012) abundant empirical evidence confirms positive effects on active aging of physical activity, as well as the negative effects of smoking, sedentary behavior and alcohol abuse.

While human capital, health and individual life-styles are “located in individuals,” social capital comes from the relations between individuals, such as the number of friends and marital or parental status. Social networks provide information, trust, support and other inputs (Wilson and Musick 1997). Studies have shown that knowing more people and being a member in more organizations increase the chances of volunteering. However, social ties may also have a negative impact on volunteering, depending on the nature of the ties and of the volunteer work, respectively. As for the effects of marital status and/or children in the household on volunteering, the findings are not consistent (Wilson 2000).

Wilson’s (2000) comprehensive study shows that different theories of volunteering still leave unexplained the differences between people from different socio-demographic backgrounds. These variables, such as gender or age groups, also have been found to have an effect on volunteering, all else considered. It is necessary, therefore, to enter them into the analytic model as well.

As to the macro-level factors that might affect the life-course trajectory, which is the topic of the current study, cross-country differences in older adults' productivity are already well-investigated, with ample evidence for an important role of the institutional set-up of pension systems (e.g. Gruber and Wise 2004). In general, the existing empirical research has demonstrated considerable cross-country variation in the productive involvement of older adults, both paid (e.g. Brugiavini *et al.* 2005) and different unpaid work (e.g. Erlinghagen and Hank 2006; Hank and Stuck 2008). Hank (2011) conducted a multilevel study of macro-social factors that explain participation in non-market productive activities. He found a significant role played by society's cultural traditions (civil liberties), as well as by welfare state interventions (government social spending).

Following the review above, the current study examines the relationship between the resources (or life chances) with which older adults are equipped at the micro-social level (especially the early-life conditions) and the extent, as well as intensity (time of contribution) of their productive involvement in the late life. Specifically, I hypothesize that older adults, who had better early-life conditions are also more productive. In particular, people are more productive if they: 1. Have inherited higher "cultural capital" from their family of origin, 2. Have a better mathematical ability and 3. Lived through favorable historical and institutional circumstances. The ultimate test will be if after accounting for other relevant individual-level variables, there still exist long-lasting correlations between the early-life conditions and extent, as well as intensity of involvement in the unpaid productive activities in the old age.

#### *4. Data and Variables*

I use the Survey of Health, Ageing and Retirement in Europe (SHARE), which is a multidisciplinary and cross-national panel database of micro data on health, socio-economic status and social and family networks of more than 55,000 individuals aged 50 or over from 20 European countries (Börsch-Supan *et al.*, 2008). The second wave of SHARE is a prospective wave that provides a detailed picture about respondents in 2006. In addition, SHARELIFE (2010) is a retrospective view across the entire life course in Europe over the past century, which relates in particular to such areas as childhood living conditions, or family history (Schröder, 2010). Combining SHARE wave 2 and SHARELIFE enables me to study the relationships between disparities in early-life conditions and extent and intensity of unpaid productive involvement among older adults.

The wave 2 sample contains 34,415 respondents from 14 European countries (Austria, Germany, Sweden, Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Czech Republic, Poland, and Ireland). Since I need information about respondents' early-life conditions, I merge the wave 2 data with the SHARELIFE (or wave 3) sample, which contains 26,836 respondents from 13 countries (without Ireland). After merging, the resulting database consists of 23,688 respondents.

In this study I suggest focusing on the subsample of 65 or older. This is the most interesting subsample. The whole sample also includes persons aged 50 – 64. Half of this latter sub-group is still working. Thus, our study would be not so much about unpaid productivity of older citizens, but rather a study of labor market participation. However, the point of interest of the current paper is the modern welfare states in which groups of people continue pursuing productive goals and engage in frequently unpaid productive activities in old age, such as different kinds of volunteerism encouraged by the state. Thus, finally, the relevant subsample of 65 years old and older contains 10,923 individuals.

#### *4.1 Dependent Variables*

*Number of Activities Outcome.* The main dependent variable is the **number of productive activities** in which respondents were involved, based upon participation in up to six realms of unpaid activity. These included helping someone within the household with personal care tasks in the previous twelve months, helping someone outside the household in any of several tasks in the previous twelve months, and caring for grandchildren without the presence of the parents. Three additional activities in which the respondent might have been engaged in the preceding month were also considered: performing voluntary or charity work, attending an educational or training course and taking part in a political or community organization. The number of areas of activity in which respondents were involved was then counted (0-6).

*Intensity of Productive Activities.* In addition to the number of productive activities, I also computed **time** that people devote to them. **Helping outside the household.** In the wave 2 questionnaire the respondents were asked if during the last twelve months they have personally given any help to a family member from outside the household, a friend or neighbor with personal care tasks. Those, who answered confirmatively, were asked about frequency of delivering the help in the last twelve months: 1. Almost daily; 2. Almost every

week; 3. Almost every month or 4. Less often. They were then asked about the number of hours devoted, while the maximum was set by the software to 3000 hours. This number may be interpreted as about 8 working hours each day during the year ( $8 \times 365 = 2920$ ). This inquiry was repeated in a loop for up to 3 different persons. Following Bolin *et al.* (2008), in order to make the answers comparable between respondents, I used the following approach. For each respondent I computed an approximate number of weekly hours, devoted to these activities, as follows: for those, answered that they provided help outside the household almost every day, I multiplied the number of reported hours by 7. For the respondents, who answered “almost every week,” I did not change the number of hours. For those, answered “almost every month,” the number of hours was divided by 4.28. Finally, for the respondents, who helped “less often,” than each month, the estimated number of hours was divided by 52. In cases of errors, such that a number of weekly hours exceeded 168, it was changed to 60 ( $\cong 8 \times 7$ ). Unlike the case of looking after grandchildren (as described below), I did not allow more than 8 hours per day, since, as was mentioned above, the software allowed working only about 8 hours each day during the year. Because SHARE asks about this kind of help tree times (for three different persons), I summed the 3 computed values of hours. Again, for a few respondents the number of weekly hours exceeded 84. In this case I changed this number to 84.

**Helping inside the household.** Next, the respondents were asked about help within their household. Namely, is there someone living in this household whom they have helped regularly during the last twelve months with personal care? Since the survey does not want to capture help during short-term sickness, “regularly” means daily or almost daily during at least three months. Although, the respondents were not asked any direct question about intensity of this productive activity, it may be assumed that the people, who do so, are working at least 8 hours 7 days a week, so they were hypothesized to work 60 weekly hours.

**Looking after grandchildren.** People, who have grandchildren, were asked if during the last twelve months they regularly or occasionally looked after their grandchildren without the presence of the parents. As with help to someone outside the household, also grandparents, who answered confirmatively to the previous question, were asked about frequency of this productive activity, using the same scale, namely: 1. Almost daily; 2. Almost every week; 3. Almost every month or 4. Less often. They were then asked about the number of hours devoted to this on a typical day/in a typical week/in a typical month/in the

last twelve months, when the maximum was set to 9000 hours. This number can be interpreted as looking after grandchildren 24 hours daily during the year ( $24 \times 365 = 8760$ ).

The present SHARE release contains these data separately about 14 grandchildren. As before, following Bolin *et al.* (2008), in order to make the answers comparable between respondents, I used the following approach. Using loop from 1 to 14, for each respondent I computed an approximate number of weekly hours, devoted to each grandchild, as follows: for those, answered that they looked after a grandchild almost every day, I multiplied the number of reported hours by 7. For the respondents, who answered “almost every week,” I did not change the number of hours. For those, answered “almost every month,” the number of hours was divided by 4.28. Finally, for the respondents, who helped “less often,” than each month, the estimated number of hours was divided by 52. The errors were corrected so that the people were allowed to look after the grandchildren at most 12 hours a day or 84 per week. Finally, all 14 possible time values were summed to receive the total number of hours devoted to this kind of activity. Again, for a few respondents the number of weekly hours exceeded 84. In this case I changed this number to 84.

#### **Volunteering, Attending Training Course or Taking Part in Political Organization.**

For the three remaining productive activities, namely did Voluntary or charity work; attended an educational or training course; or taken part in a political or community-related organization, people were asked if in the last four weeks they did so 1. Almost daily; 2. Almost every week; or 3. Less often. To compute the intensity of those activities, I used the following approach. I assumed that those, who do at least one of these almost daily, work at least half-time, i.e. 20 hours per week. Those, who work almost every week, devote at least one full day a week, 8 hours. Those, who report working “Less often,” devote at least 8 hours once during the 4 weeks a month, i.e.  $8/4 = 2$  hours a week. Finally, I summed up all the 6 intensities into one variable.

## *4.2 Independent Variables*

### *Early Life Conditions*

**Books.** As was already mentioned, I introduce into the regression equation, a variable from SHARELIFE, based on a question asking the respondent to estimate how many books were there in the place s/he lived at the age 10 (not counting magazines, newspapers, or



school books). The question had 5 categories of answer: 1. None or very few (0-10 books); 2. Enough to fill one shelf (11-25 books); 3. Enough to fill one bookcase (26-100 books); 4. Enough to fill two bookcases (101-200 books); and 5. Enough to fill two or more bookcases (more than 200 books).

**Relative Math and Language Performance at 10.** SHARELIFE also provides user with the knowledge about subjectively rated relative position to others in mathematics and language. The respondents were asked if compared to other children in the class they performed in math: 1. Much better, 2. Better, 3. About the same, 4. Worse or 5. Much worse than the average. The same scale was used to assess the relative performance in the country's language. I recoded these variables to run in the opposite direction from 1 "much worse" to 5 "much better" (Math and Verb respectively).

**Area of Residence When 10.** This variables and its offshoot, Rural\_age10, were computed, using the SHARELIFE wave of the data. In SHARELIFE, the respondents were asked repeatedly about the different places, where they have lived during life since birth. If a respondent told that his/her family moved, s/he was repeatedly asked in loop from 0 to 50 when they started and **finished** living in the residence, while answers ranged from 1900 to 2009 (code 9997 refers to the case, when respondent still lives in the same residence). They were asked a series of questions about each accommodation, including the question about the area where this residence was located: 1. A big city 2. The suburbs or outskirts of a big city 3. A large town 4. A small town 5. A rural area or village. To compute, the variable, which answers the question, where the respondent has lived at age 10 or older, I subtracted the year of birth from the year of leaving a residence. If this difference was greater than 10, I recorded the area of residence. Otherwise, I proceeded with loop computing the age of leaving the residence, and updating both the year of leaving and the area. I repeated these operations while the variable, containing the age of leaving the residence, was receiving new values, different from missing. In fact, after examining years of leaving of 10 residences, no new values were generated. Next, I computed the dummy Rural\_age10, which is a dummy, assuming the value of "0," if the original variable ranges from 1 to 4, i.e. City, outskirts of a big city, Big Town or Small town, and "1," if the original variable has the value 5 "Village."

**Early-Life Trauma.** This variable, based on a question from SHARELIFE, and is a count of the following events during the life: lived in a children's home; been fostered with another family; evacuated or relocated during a war; lived in a prisoner of war camp; lived in prison; lived in a labor camp; lived in a concentration camp; been an inpatient in a TB

institution; stayed in a psychiatric hospital; been homeless for 1 month or more. An additional variable entered into this block was country of interview, under the assumption that this is the same country as the one of the birth.

### *Human capital and Health*

**Individual net-worth (Wealth).** To derive equivalent disposable wealth, household net-worth variable, provided by the wave 2 was standardized by the household-size square root, and then recoded into quintiles. **Years of Education** is a question, asked in SHARE wave 2 questionnaire: how many years the respondent spent in full time education. The software allowed values from 0 to 25. **Self-Perceived Health** variable was recoded to run from 1, “Poor” to 5, “Excellent.” **Activities of Daily Living (ADL) or Instrumental Activities of Daily Living (IADL).** The variable of own limitations was computed in such a way that it received a value of 0 in case of no ADL or IADL, and the value “1” in case when one of own ADL or IADL is greater than 0. Finally, “depressive symptoms” is a dummy variable, telling if a respondent had suffered from 3 or more depressive symptoms in the last month. This variable is computed, using the Mental Health module of the SHARE wave 2 questionnaire.

### *Health-Related Behavior*

**Smoking.** In the wave 2 of SHARE, only the respondents, who did not respond to the wave 1, were asked if they have ever smoked daily for a period of at least one year. Those, who answered confirmatively, or those, who also participated in the wave 1, were then asked, if they smoke at the present time. This latter question, therefore, had 5,252 missing values. Most of these values were set to “no,” consistently with the answers to the former question. Thus, we receive a full picture about **smoking at the present time**, the dummy **current smoking**. In addition, to fill the missing values in the dummy variable “**ever smoked**” for the people, who participated in the both waves, and therefore were not asked this question in the wave 2, the behavioral risk data from SHARE wave 1 were merged with the wave 2.

**Drinking Alcohol.** The respondents were asked how often during the last 3 months, have they drunk any alcoholic beverages. The answers followed the scale: 1. Almost every day; 2. Five or six days a week; 3. Three or four days a week; 4. Once or twice a week; 5. Once or twice a month; 6. Less than once a month; and 7. Not at all in the last 3 months.

Those, who reported an answer 1 to 6, were then asked how many drinks they drink per day: “on the days you drink, about how many drinks do you have?” The software allowed entering an estimated number of drinks, ranging from 1 to 70. This variable was used as a measure of alcohol consumption. Those, who answered to the first question was “Not at all in the last 3 months,” were given the value of 0 drinks. While, for those, who cited a number higher than 30, the value was set to 30.

**Making Sports.** I used 2 variables to grasp the physical activity of the respondents. These variables were computed, using the following questions. First, how often do you engage in vigorous physical activity, such as sports, heavy housework, or a job that involves physical labor? The answers were: 1. More than once a week 2. Once a week 3. One to three times a month 4. Hardly ever, or never. The second question was: How often do you engage in activities that require a moderate level of energy such as gardening, cleaning the car, or doing a walk? This question used the same scale of answers as the previous one. I recoded them into the dummies as follows: **vigorous sport** is 1 if the original variable has values 1 to 3 and 0, if the original is 4. The **moderate sport** was computed in the same manner.

### *Social capital*

The social capital variables included the presence of a partner (recoded as 1 for respondents living with a partner and 0 for all others); household size and the number of living children. Additional variables in this block included 1) going to a sport, social or other kind of club, and 2) taking part in a religious organization. It should be noted that these last two variables are not part of the domain of productive activity as conceptualized in this investigation. I use them as measures of social capital because, as was noted earlier, knowing more people and being a member of more organizations were found to be predictors of productive involvement.

### *Demographic and Other Factors*

**Area of Present Residence.** I created a dummy, called **Rural\_d**, which assumes value of 0 if the original variable ranges from 1 to 4, i.e. City, outskirts of a big city, Big Town or Small town, and **Rural\_d=1**, if the original variable has the value 5 “Village.” Additional demographic variables entered into the analysis were age and gender. Finally, this block also included the variable about **Spouses’ ADL and IADL**. To compute it, I used the variable *cvidp* (the partner’s identifier inside the household) to create a new file, where *mergeid* (the

respondent's identifier in the SHARE database) is not of the respondent, but that of his or her spouse. This new file, containing *Resp\_mergeid*, as well as the *mergeid* (the one of the spouse), was merged with the original file. This operation gave me the necessary file, in which I have all the data about the respondent's spouse. Then, this was merged again, using *Resp\_mergeid* with the original file, thus adding to the respondents' data the variables about their spouses. This was done to create a file of spouses' ADL and IADL limitations. For individuals, who don't have spouses I set the value of the target variable to zero.

## 5. *Empirical Results*

This study aims at estimation of the influence of the Early-Life Conditions on productive performance of the older adults in Europe. Taking all the above into account, and applying the reasoning, proposed by Mazzonna (2014), I characterize the early familial milieu by estimated number of books at home, relative language proficiency at 10 and area of residence (urban or rural). In addition, I also considered such measures as the occupation of the main breadwinner and the number of facilities in the accommodation at 10 (fixed bath, cold and hot running water supply, inside toilet and central heating). However, due to high correlations between books, facilities and occupation level (as described in the Appendix and also reported in Mazzonna (2014:29)), I dropped the two latter variables from the final analysis. Relative performance in Math at 10 serves as a proxy for initial (or genetic) endowment. Finally, the historical and institutional circumstances are conceptualized as experiencing a traumatic event during childhood. In addition to the variables of the main interest I also use controls, which were found as important predictors of productive aging, as was described in the literature review.

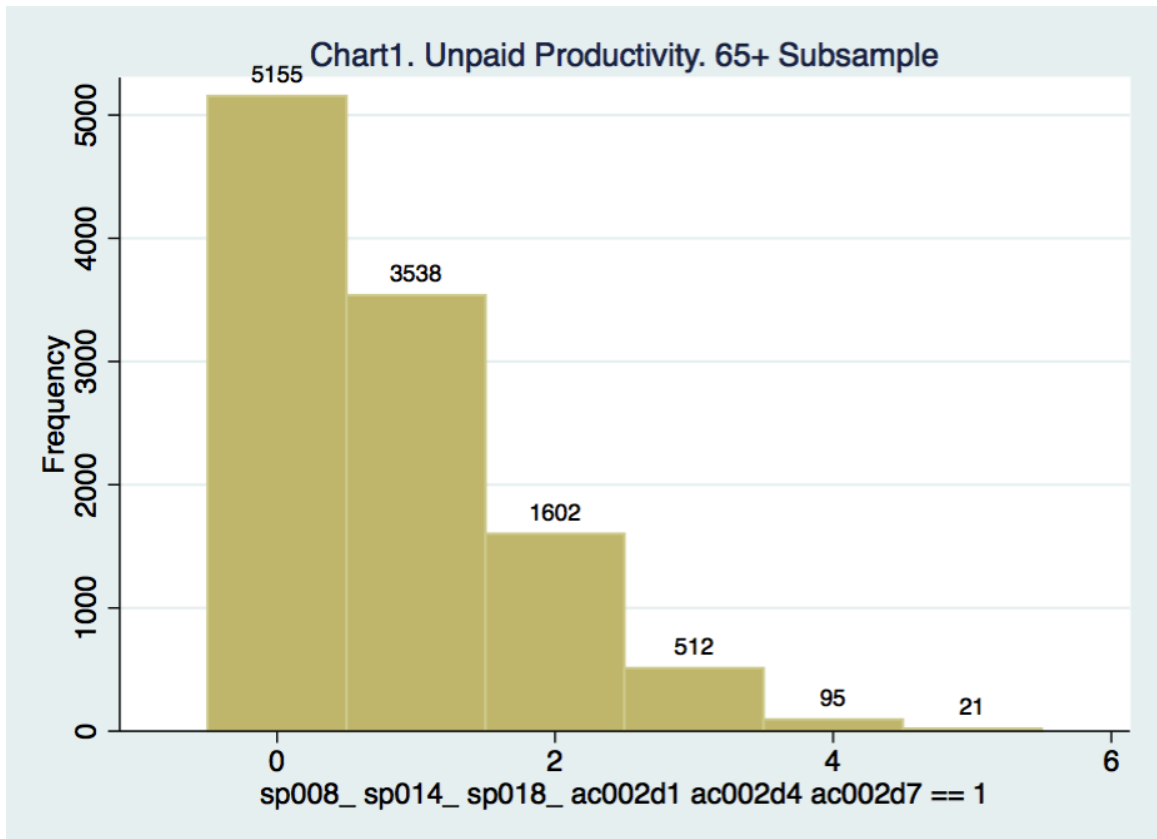
Since the first outcome variable is categorical, I apply the Ordered Probit model to estimate the equation for the number of productive activities. I run the same model 3 times. First, I look at the whole subsample of 65+, then I run the same model for the subsample of males, 65+ and finally for the one of females. Then I use the Tobit regression to estimate the intensity equation. Also Tobit is run for the three subsamples, as in the case of the 1<sup>st</sup> equation. Finally, after each of the estimations, I run F-Test for joint significance of categories for key categorical independent variables.

## 5.1 Descriptive Statistics

The univariate statistics for all study variables are summarized in Table 2. First, it should be noted that only 5.5% of this sample are employed. The vast majority (81%) define themselves as retired; and 13% said that they are homemakers. The average number of the unpaid productive activities among respondents aged 65 or older is slightly less than one. Table 1 (and Chart 1) show that a little bit less than one-half (47%) of the sample are not involved in any kind of productive activity. One-third (32%) of the respondents are performing one productive activity; 15% are performing 2 activities; only less than 6% of the respondents reported performing 3 and more activities (the “highly productive people”). Thus, it is evident that the half of the sample of 65+ is “productive.”

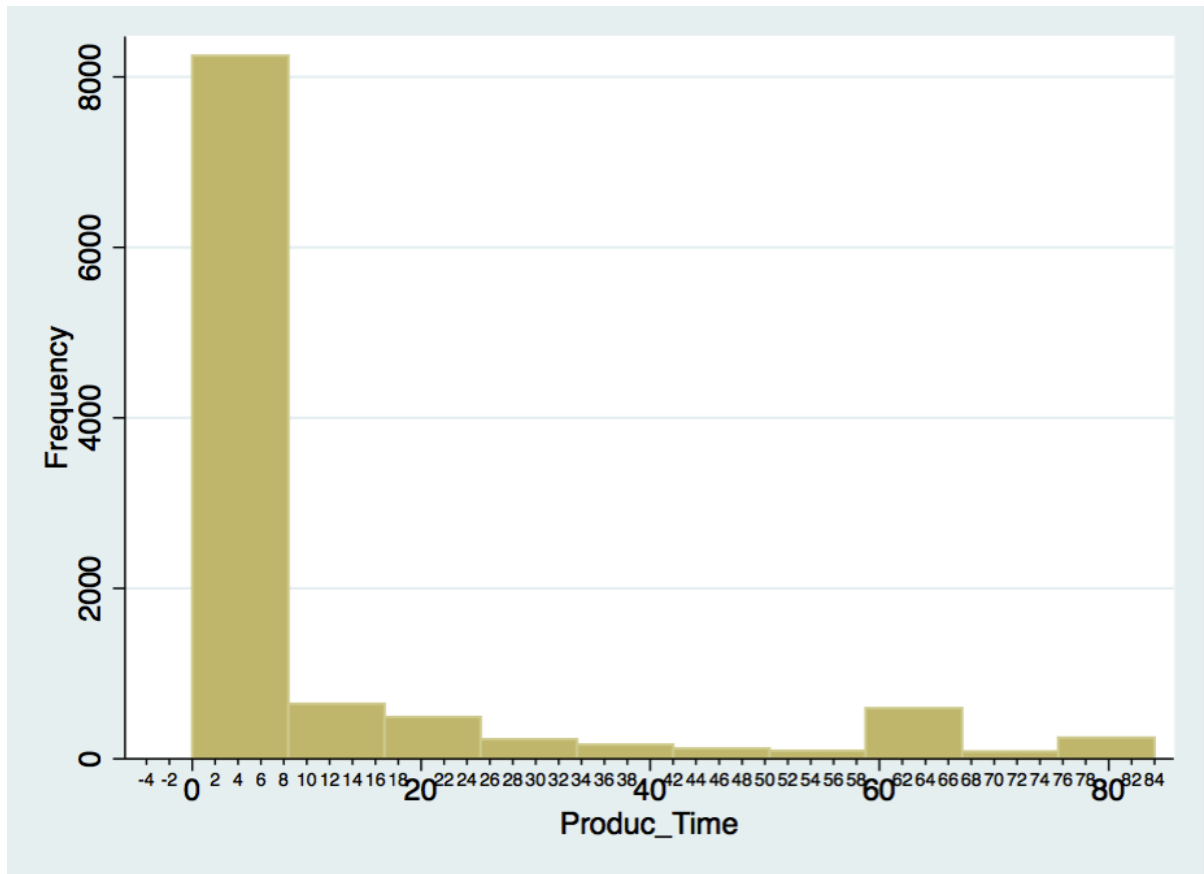
Table 1. Distribution of the **Number** of Productive Activities, Respondents 65+

Number of Productive Activities	Freq.	Percent	Cum. Percent
0	5,155	47.19	47.19
1	3,538	32.39	79.58
2	1,602	14.67	94.25
3	512	4.69	98.94
4	95	0.87	99.81
5	21	0.19	100.00
Total	10,923	100.00	100.00



As to the second measure of productivity, the intensity (i.e. the number of weekly hours, devoted to the 6 productive activities), on average the respondents work 11 hours per week. However, the standard deviation shows high variation from the mean, i.e. the productive hours are spread out over a large range of values. Chart 2 below provides the graphical evidence about the distribution.

Chart2. Distribution of the hours invested in Productive activities by the Respondents 65+



On average, people reported having 11-25 books at home when they were 10. A little more than two-fifth of the respondents (44%) said that they had “none or very few (0-10 books);” a little more than fifth (22%) said that they had “enough to fill one shelf (11-25 books);” fifth had “enough to fill one bookcase (26-100 books).” Finally, 6% had “enough to fill two bookcases (101-200 books)” and the same percentage had as many as 200 books and more. Some 14% of the sample reported that they have experienced at least one of the events, such as living in a children's home or in a prisoner of war camp (Early-Life Trauma). Average performance in mathematics compared to other children was 3 “about the same” on the scale 1 to 5. The same average score was found for the relative performance in country’s language. The average of years of education in the sample is 9. The average self-perceived health is almost 3 (“good”). A bit more than one-quarter of the sample (26%) reported having 3 or more depressive symptoms, and thus are depressed according to the EURO-D definition. Some 12% are currently smoking, while 41% reported that they have smoked during their life-course. Almost third (29%) of the respondents reported that they do not drink any alcohol; a bit more than one-fourth (27%) reported drinking 1 drink a day; and

almost one-fourth (23%) is drinking 2; the remaining fifth is distributed between 3 and 30 drinks.

Almost half of the sample (48%) reported that they engage in vigorous sportive activities more often than “hardly ever or never;” while a vast majority (85%) said that they engage also in moderate sportive activities. A little more than one-quarter of the sample (26%) reported that they personally have at least one ADL or IADL limitation. As to the spouses, 7% reported that they have ADL limitations and 11% that they have IADL limitations. The average age was 73.5 years old. Males constitute a little less than half of the sample (46%). On average the respondents reported to belong to the 3 quintile vis-à-vis their disposable net-worth. The average expectation to receive a bequest was very low: 5% on the scale 0 – 100. As to the social capital, the majority of the sample - 67% - has a spouse or a partner; the average size of the household in the sample is 2 persons, and the average number of children is 2.3. Eighteen percent reported attending a social club and 14% attended a religious organization. Almost one-third (29%) are living in rural area. In comparison, one-half (49%) were living in the rural area at the age 10.

Table 2. Summary Statics, Subsample of 65 and older

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Number of productive activities	10923	0.802	1	0.936	0	5
Intensity	10923	10.408	0.06	20.273	0	84
Books	10737	1.850	1	1.121	1	5
Early-Life Trauma	10923	0.155	0	0.419	0	4
Math	10288	3.278	3	0.890	1	5
Verb	10269	3.308	3	0.865	1	5
Edu	10723	9.341	9	4.391	0	25
Self-Perceived Health	10923	2.713	3	1.053	1	5
Depressive symptoms	10656	0.264		0.441	0	1
Current smoking	10823	0.115		0.319	0	1
Ever smoked	10861	0.406		0.491	0	1
Alcohol	10776	1.829	1	4.208	0	30
Vigorous Sport	10818	2.878	4	1.286	1	4
Vigorous Sport Dummy	10818	0.484		0.500	0	1
Moderate Sport	10819	1.718	1	1.119	1	4
Moderate Sport Dummy	10819	0.845		0.362	0	1
ADL or IADL	10923	0.260		0.439	0	1



Variable	Obs	Mean	Median	Std. Dev.	Min	Max
ADL Spouse	10045	0.162	0	0.715	0	6
IADL Spouse	10045	0.269	0	0.935	0	7
Age	10923	73.522	72	6.425	65	99
Age2	10923	5446.713	5184	975.458	4225	9801
Male	10923	0.456		0.498	0	1
Wealth	10923	2.898	3	1.416	1	5
Expectation to receive bequest	10642	4.933	0	17.787	0	100
Spouse	10922	0.673		0.469	0	1
hhsz	10923	1.942	2	0.908	1	11
nchild	10923	2.297	2	1.491	0	16
Social Club	10923	0.184		0.387	0	1
Religious Organization	10923	0.135		0.342	0	1
Urban	10923	3.410	4	1.383	1	5
Rural_d	10923	0.289		0.453	0	1
Rural_age10	10851	0.485		0.500	0	1

Finally, one issue should be addressed. It may be claimed that having a sick spouse at home may force the other spouse, especially a healthy one, to deliver help. Therefore, perhaps it does not make sense to count the help inside the household as a kind of voluntary unpaid productive activity. First, the question about helping someone inside the household may relate to another member, not necessarily the spouse. Second, our data do not confirm this view, i.e. there are many spouses, who don't report helping inside the household, even when having a spouse with an ADL limitation. Table 3 shows that among healthy people aged 65 or older (with no own ADL or IADL limitations), who have a spouse with ADL limitations, only 38.5% report helping inside the household. Among people 65+, who themselves suffer from ADL or IADL limitations and also have a spouse with ADL limitations, 28% give such help. This means that providing help inside the household is not a direct function of having a sick spouse (e.g. ADL limitations), and thus **constitutes** a voluntary productive activity.

Table 3. Giving Help inside the Household, by Own Health Status and by the Health Status of the Spouse

Own ADL or IADL	Given help to someone inside the household	Having a spouse with ADL		Total
		No Limitations	1+ Limitations	
No	no	96.72	61.52	94.83
	yes	3.28	38.48	5.17
	Total	100.00	100.00	100.00
1+ Limitations	no	93.41	71.91	90.55
	yes	6.59	28.09	9.45
	Total	100.00	100.00	100.00

## 5.2 Bivariate Associations

The next stage of the analysis was examination of bivariate associations (Spearman's rho) between the independent variables and the 2 measures of productive involvement (Table 5). The correlations reveal that all of the study variables have significant associations with the **number** of productive activities. The most salient finding was that the number of books at age 10 is highly significant and belongs to a group of correlates with rho greater than 0.10; other variables, describing the early-life circumstances, namely relative performance in math and language are also highly significant and belong to the same group of the correlates (with rho greater than 0.10). It should be noted that other early-life variables: Early-Life Trauma and living in the rural area showed less strong association. The correlates with the highest rho (greater or equal 0.20) are: age, age2 (both negative), engagement in moderate sportive activities, years of education, self-perceived health, drinking alcohol and participation in social club.

Nevertheless, it is interesting that 30% of the respondents aged 80+ reported being involved in one of the unpaid productive activities; and almost 8% of them are doing 2 or more such activities. The same is true for those in poor health: some 35% of them are nevertheless performing unpaid productive activities, while some 8.5% are involved in 2 or more (see Table 4 below).

Table 4. Number of Productive Activities, by Age Group and Self-Reported Health, Respondents 65+ (in percentage)

Age	Number of Productive Activities							Total
	0	1	2	3	4	5		
65-69	34.27	35.61	21.26	7.16	1.32	0.38	100	
70-79	47.39	33.65	13.61	4.44	0.78	0.13	100	
80+	69.65	23.48	5.65	0.93	0.93	0.00	100	
Total	47.19	32.39	14.67	4.69	0.87	0.19	100	
<b>Self-Perceived Health</b>								
Poor	64.34	27.06	6.91	1.32	0.29	0.07	100	
Fair	51.71	33.07	11.84	2.81	0.45	0.12	100	
Good	44.89	32.9	15.56	5.24	1.21	0.2	100	
Very good	35.48	34.36	20.85	7.87	1.11	0.33	100	
Excellent	30.99	32.31	24.71	10.09	1.46	0.44	100	
Total	47.19	32.39	14.67	4.69	0.87	0.19	100	

As to the **intensity** of productive activities, its correlation with three study variables is found to be statistically not significant: gender and living in the rural area at age 10, as well as living in the rural area today. At the same time, the number of books at age 10 is highly significant and has rho equal to 0.10. In a similar vein, the relative performances in math and language both have rho of 0.08 and are highly statistically significant correlates. The other variable, describing the early-life condition, i.e. Early-Life Trauma is only moderately correlated with the intensity of productive activities (rho of 0.03). The highest rho characterizes (perhaps not surprisingly) the negative association between the intensity of unpaid productive activities and the age. The group of variables that are especially highly correlated with the intensity of unpaid productive activities (rho between 0.10 and 0.20) are engagement in moderate and vigorous physical activities, having a spouse, years of education, drinking alcohol, having a spouse with ADL limitation/s, attending a social club, household size, self-perceived health, having own ADL or IADL limitation/s (negative), attending a religious organization, wealth, and the number of children.

Table 5. Bivariate Associations between the Two Productive Outcomes and the Study Variables: Spearman's rho, Respondents 65+

	Number of Productive Activities	Intensity
Books	0.16***	0.10***
Early-Life Trauma	0.04***	0.03**
Math	0.11***	0.08***
Verb	0.11***	0.08***
Rural_age10	-0.02*	-0.01
Edu	0.20***	0.14***
Wealth	0.18***	0.11***
Expectation to receive bequest	0.08***	0.05***
Self-Perceived Health	0.20***	0.13***
depressive symptoms	-0.09***	-0.05***
ADL or IADL	-0.15***	-0.11***
male	0.03**	0.01
Age	-0.26***	-0.22***
Age2	-0.26***	-0.22***
Spouse	0.13***	0.15***
hhsiz	0.07***	0.13***
nchild	0.11***	0.10***
Social Club	0.20***	0.13***
Religious Organization	0.14***	0.11***
ADL Spouse	0.07***	0.13***
IADL Spouse	0.03**	0.09***
Ever smoked	0.05***	0.03**
Alcohol	0.20***	0.13***
Vigorous Sport Dummy	0.19***	0.16***
Moderate Sport Dummy	0.21***	0.16***
Rural_d	-0.03*	-0.01

Legend: \* p<.05; \*\* p<.01; \*\*\* p<.001

The Charts 3 – 5 below reveal a clear gradient in the mean number of activities by the number of books at home at the age of 10: for the whole 65+ subsample, as well as for the male and female subsamples.

Mean of Number of Productive Activities at 65+, by number of Books at home at age 10

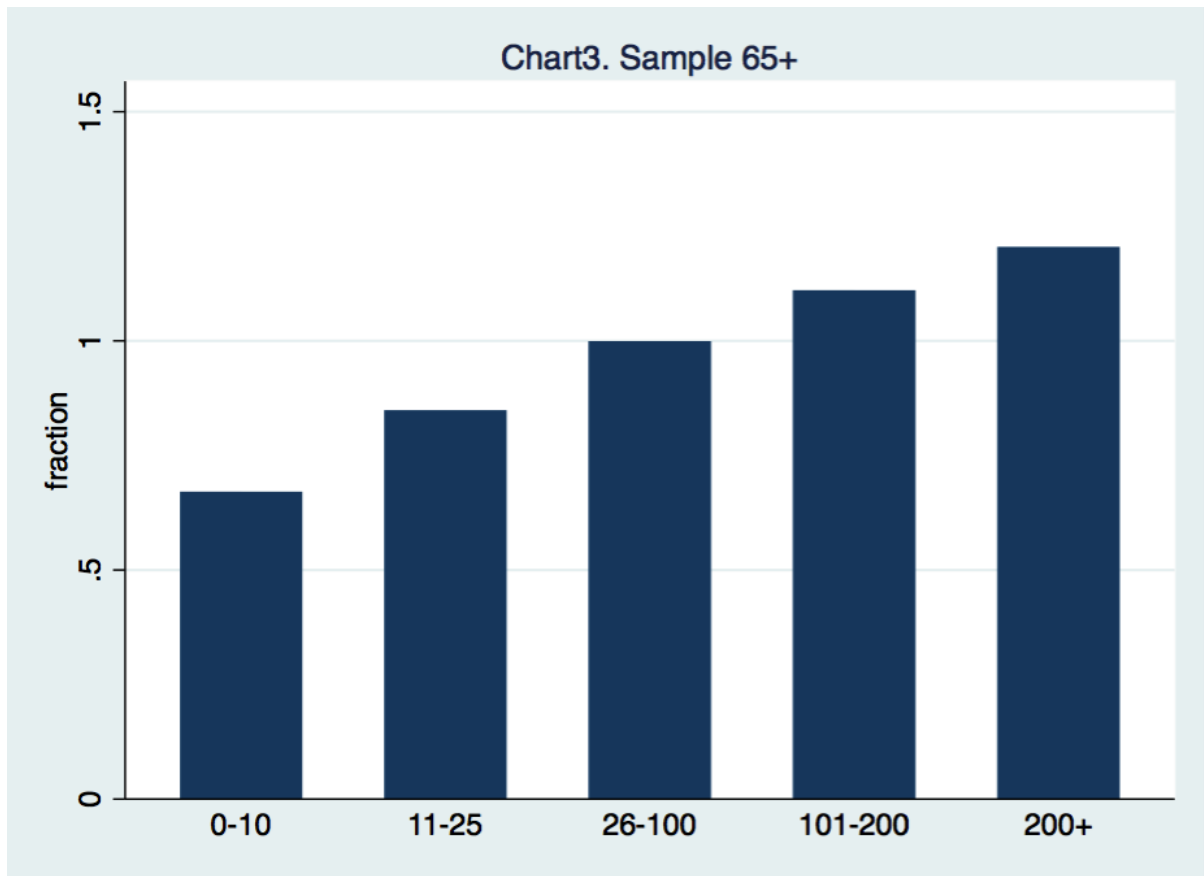


Chart4. Male Subsample 65+

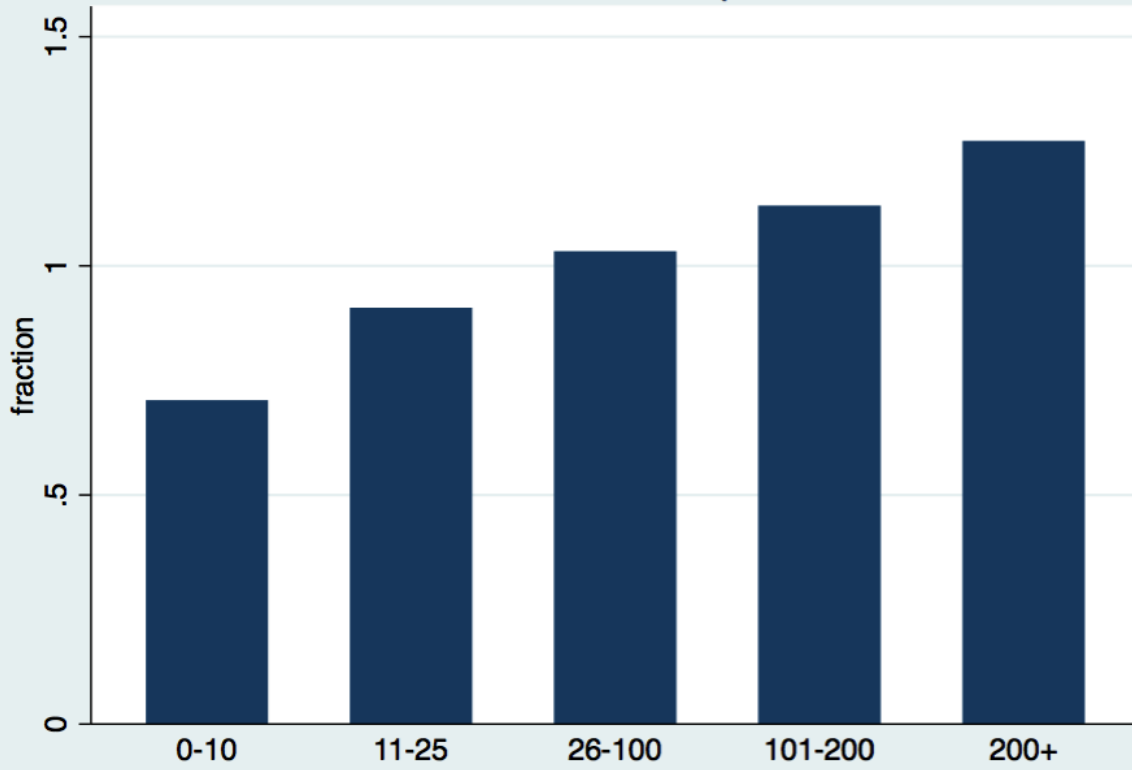
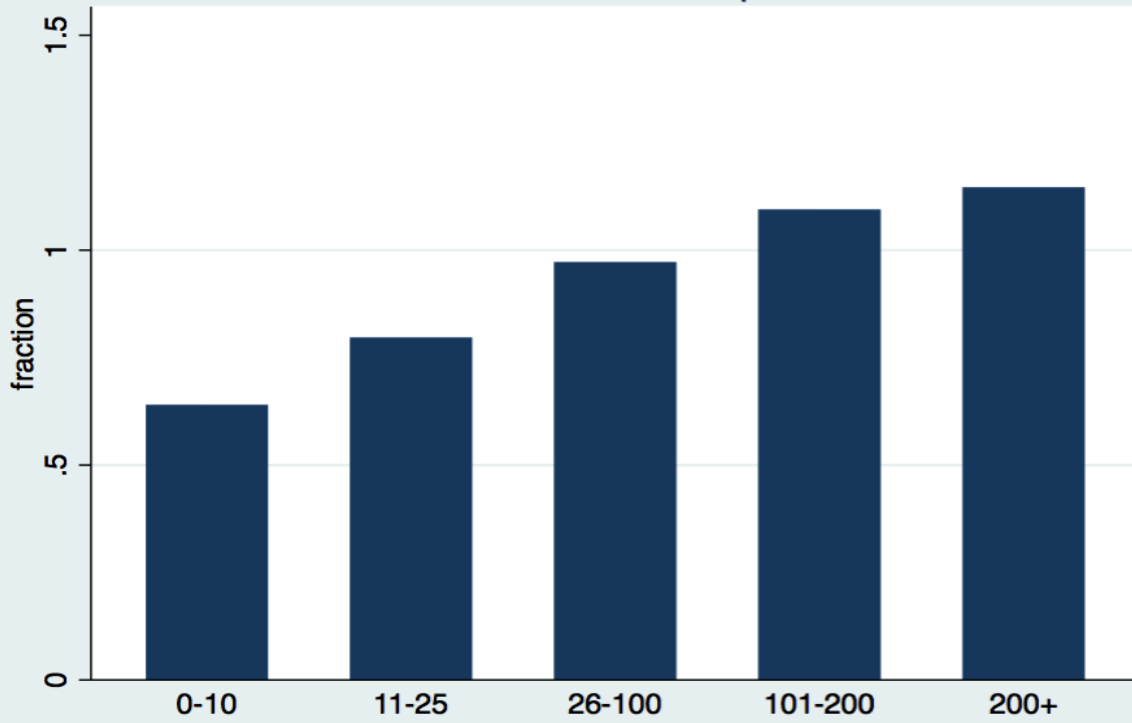


Chart5. Female Subsample 65+



### 5.3 Multivariate Analyses

Since the first outcome variable is categorical, I apply ordered probit regression. This method allows us to interpret the sign and significance of the regression parameters ( $\beta$ ). The sign determines whether the outcome variable increases with the regressors: if  $\beta$  is positive, then an increase in  $x_{ij}$  necessarily decreases the probability of being in the lowest category ( $y_i=1$ ) and increases the probability of being in the highest category ( $y_i=m$ ). Significance of the regressors is also an important feature that might be inferred from the output. The marginal effect of the regressors can be obtained, using the *margins* command (Cameron and Trivedi 2010, 527-528).

My second outcome is hours, spent on performing productive activities. Therefore I use the Tobit model to estimate the equation. Tobit is a statistical model proposed to describe the relationship between a non-negative dependent variable  $y_i$  and an independent vector  $x_i$ . The model supposes that there is a latent (i.e. unobservable) variable  $y_i^*$ . This variable linearly depends on  $x_i$  via a vector of parameters  $\beta$  which determines the relationship between the independent vector  $x_i$  and the latent variable  $y_i^*$ . The observable variable  $y_i$  is defined to be equal to the latent variable whenever the latent variable is above zero and zero otherwise.

$$y_i = \begin{cases} y_i^* & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases}$$

where  $y_i^*$  is a latent variable:  $y_i^* = \beta x_i + u_i, u_i \sim N(0, \sigma^2)$

The  $\beta$  coefficient should be interpreted as the combination of (1) the change in  $y_i$  of those above the limit, weighted by the probability of being above the limit; and (2) the change in the probability of being above the limit, weighted by the expected value of  $y_i$  if above (McDonald and Moffit, 1980).

## 5.4 Estimation Results

### 5.4.1 Ordered Probit for the **Number** of Unpaid Productive Activities, performed by the Citizens aged 65 and Older

Table 6 (below) shows results for ordered probit regression used for the specification described above. It is evident that running the same regression in 2 different subsamples: males and females aged 65 and older helps to uncover important differences between the two.

In the entire subsample of respondents aged 65 and older all but one category of the “books” variable are significantly positively correlated with the outcome (the number of the unpaid productive activities); none of these categories is significant in the subsample of males 65+; finally, for females 65+ all of the categories of this study variable are significantly positively correlated with the outcome. The F-test for joint significance, at the bottom of the table, shows that the categories of the “books” variable are jointly significantly correlated with the outcome for both the entire 65+ subsample, and the one of females 65+; it is not jointly significant for the subsample of males 65+. Concerning the Early-Life Trauma, only experiencing one such event (in comparison to none) is a significant *positive* correlate of the outcome in all the subsamples. However, it is more significant for males than for females. The F-test for joint significance shows that the categories of this variable are jointly significantly *positively* correlated with the outcome for both the entire 65+ subsample, and the one of males; it is correlated with the outcome in the subsample of females 65+ only at 10% level. Next, regarding the relative math performance – which was selected as a proxy for genetic endowment – it was found that one of its categories “better than the average” is significant only in the male subsample. The F-test for joint significance shows that the categories of this variable are jointly insignificant for any of the subsamples. It is interesting that although no language performance’s category is separately significant in all the 3 subsamples, the F-test reveals a more appealing finding. This variable is a jointly significant correlate of the number of unpaid activities performed for both the whole subsample, as well as for the female one. It is not jointly significant correlated with the outcome in the subsample of males 65+. Finally, the early-life variable, living in the rural area, is not a significant correlate of the outcome in any of the subsamples.

Other variables that correlate significantly (but differently for different subsamples of 65+) with the number of performed unpaid productive activities are as follows. The two



highest quintiles of wealth are equally significant correlates for males and females. However, the F-test shows that the categories of this variable are jointly much more significant for males than for females. The expectation to receive bequest is also more significant for men than for women. Interestingly, the F-test for joint significance reveals that the self-perceived health is a significant correlate for women and also for the whole 65+ subsample, but not at all for men. Regarding the presence of 3 or more depressive symptoms in the last month, it is significant only for the female subsample. Interestingly, the association is positive, i.e. women with such symptoms are more prone to be involved in unpaid productive activities. This point is addressed in the chapter Discussion. The next intriguing finding is that the presence of a partner is equally strongly significant correlate of being productive, but positively for males and negatively significant for females; it is not significant at all in the whole 65+ subsample. The household size has a significant association with being productive for females and in the entire 65+ subsample, but not for males. Having a spouse with IADL limitation/s is significant associates in all the subsamples. However, it is a less significant correlate of activity for males than for females (and the whole subsample 65+). The same is found with respect to vigorous sport activity.

For all the 3 subsamples, the variables equally highly positively and significantly correlated with the outcome are: years of education, number of children, attendance of social club or a religious organization, having a spouse with ADL limitation/s, and performing moderate sport activity. The country dummies capture cross-country differences. Insignificant regressors are: own ADL/IADL, age, ever smoking, alcohol consumption, and the present area of residence.

Table 6. Ordered Probit regression for **Number** of Unpaid Productive Activities for Respondents aged 65+

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
Number of Productive Activities			
Books <sup>1</sup>			
2. 11-25 books	0.0722* [0.0328]	0.0374 [0.0484]	0.0970* [0.0450]
3. 26-100 books	0.110**	0.072	0.148**

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
	[0.0377]	[0.0559]	[0.0515]
4. 101-200 books	0.116 [0.0595]	0.0214 [0.0913]	0.178* [0.0792]
5. More than 200 books	0.152* [0.0629]	0.105 [0.0934]	0.183* [0.0859]
Early-Life Trauma <sup>4</sup>			
1 Kind of trauma	0.134*** [0.0379]	0.143** [0.0551]	0.123* [0.0527]
2 Kinds of trauma	0.0237 [0.105]	-0.065 [0.135]	0.134 [0.169]
3 Kinds of trauma	0.381 [0.291]	0.419 [0.385]	0.339 [0.449]
4 Kinds of trauma	0.498 [0.654]	-0.338 [0.913]	1.675 [1.037]
Math <sup>5</sup>			
worse than the average	0.0571 [0.0935]	0.234 [0.149]	-0.0485 [0.121]
about the same than the average	0.0573 [0.0888]	0.226 [0.142]	-0.044 [0.116]
better than the average	0.129 [0.0908]	0.286* [0.144]	0.0379 [0.119]
much better than the average	0.103 [0.0966]	0.196 [0.151]	0.0823 [0.128]
Verb <sup>6</sup>			
worse than the average	-0.108 [0.114]	-0.0829 [0.162]	-0.165 [0.162]

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
about the same than the average	-0.11 [0.111]	-0.0621 [0.158]	-0.195 [0.156]
better than the average	-0.0488 [0.112]	-0.0389 [0.160]	-0.0973 [0.158]
much better than the average	0.051 [0.117]	0.0617 [0.169]	-0.0231 [0.164]
Rural_age10	0.0423 [0.0276]	0.0542 [0.0409]	0.0412 [0.0378]
Edu	0.0203*** [0.00385]	0.0195*** [0.00537]	0.0217*** [0.00566]
Wealth <sup>7</sup>			
2 <sup>nd</sup> quintile	0.0339 [0.0402]	0.0311 [0.0612]	0.0383 [0.0538]
3 <sup>rd</sup> quintile	0.0561 [0.0403]	0.0152 [0.0611]	0.0951 [0.0541]
4 <sup>th</sup> quintile	0.180*** [0.0408]	0.220*** [0.0619]	0.151** [0.0550]
5 <sup>th</sup> quintile	0.204*** [0.0499]	0.229** [0.0756]	0.182** [0.0672]
Expectation to receive bequest	0.00285*** [0.000660]	0.00316*** [0.000942]	0.00279** [0.000938]
Self-Perceived Health <sup>8</sup>			
2. Fair	0.0423 [0.0492]	-0.0175 [0.0774]	0.0702 [0.0642]
3. Good	0.0562 [0.0513]	0.018 [0.0797]	0.0669 [0.0676]

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
4.Very good	0.146* [0.0589]	0.0641 [0.0888]	0.222** [0.0797]
5.Excellent	0.150* [0.0689]	0.0495 [0.101]	0.245* [0.0967]
Depressive symptoms	0.0485 [0.0323]	-0.0315 [0.0541]	0.0834* [0.0408]
ADL or IADL	-0.0378 [0.0350]	0.00802 [0.0566]	-0.0647 [0.0450]
Male	-0.0197 [0.0289]		
Age	0.0725 [0.0449]	0.126 [0.0700]	0.0024 [0.0593]
Age2	-0.000779** [0.000300]	-0.00107* [0.000468]	-0.000371 [0.000395]
Spouse	-0.0133 [0.0345]	0.173** [0.0580]	-0.148*** [0.0442]
hhsz	0.0537** [0.0181]	0.0282 [0.0280]	0.0794*** [0.0238]
nchild	0.0645*** [0.00881]	0.0653*** [0.0136]	0.0604*** [0.0117]
Social Club	0.293*** [0.0316]	0.294*** [0.0446]	0.298*** [0.0454]
Religious Organization	0.503*** [0.0356]	0.550*** [0.0571]	0.466*** [0.0463]
ADL Spouse	0.374*** [0.0524]	0.333*** [0.0731]	0.412*** [0.0763]
IADL Spouse	0.191***	0.148*	0.254***

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample	
	[0.0439]	[0.0590]	[0.0666]	
Ever smoked	-0.0422 [0.0274]	-0.0247 [0.0377]	-0.0734 [0.0415]	
Alcohol	0.000465 [0.00310]	-0.000203 [0.00373]	0.00689 [0.00575]	
Vigorous Sport Dummy	0.163*** [0.0277]	0.129** [0.0413]	0.194*** [0.0380]	
Moderate Sport Dummy	0.330*** [0.0440]	0.369*** [0.0731]	0.303*** [0.0557]	
Rural_d	-0.0201 [0.0300]	-0.0749 [0.0435]	0.0301 [0.0417]	
Country <sup>9</sup>				
	DE	0.262** [0.0850]	0.255* [0.129]	0.268* [0.115]
	SE	0.557*** [0.0887]	0.437** [0.135]	0.679*** [0.119]
	NL	0.552*** [0.0848]	0.442*** [0.130]	0.651*** [0.114]
	ES	-0.0015 [0.0909]	-0.192 [0.139]	0.176 [0.122]
	IT	0.234** [0.0823]	0.0477 [0.125]	0.421*** [0.111]
	FR	0.228** [0.0846]	0.113 [0.131]	0.329** [0.112]
	DK	0.500*** [0.0881]	0.477*** [0.136]	0.532*** [0.117]
	GR	0.00578	-0.178	0.168

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
	[0.0843]	[0.129]	[0.113]
CH	0.195* [0.0913]	0.137 [0.141]	0.262* [0.121]
BE	0.526*** [0.0805]	0.419*** [0.125]	0.618*** [0.107]
CZ	-0.136 [0.0905]	-0.294* [0.141]	-0.00393 [0.119]
PD	0.00892 [0.0926]	-0.0893 [0.142]	0.0925 [0.124]
N	8791	3989	4802
pseudo R-sq	0.108	0.1	0.123
F-test	Prob > chi2	Prob > chi2	Prob > chi2
Books	0.0138	0.6691	0.0157
Early-Life Trauma	0.0029	0.0404	0.0911
Math	0.2019	0.2580	0.2293
Verb	0.0132	0.5276	0.0407
Self-Perceived Health	0.0305	0.7376	0.0065
Wealth	0.0000	0.0003	0.0264

Standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Reference categories: 1. 0-10 books; 4. No trauma; 5. Much worse than the average; 6. Much worse than the average; 7. 1<sup>st</sup> quintile; 8. 1 Poor; 9. AU

#### 5.4.2 TOBIT regression for the **Intensity** of Unpaid Productive Activities, performed by the Citizens aged 65 and Older

As with the number of performed productive activities, the Table 7 (below) shows that running the same Tobit regression specification in 2 different subsamples (males and females aged 65 and older) helps to uncover important differences between the two. The three last categories of the “books” variable are significant positive correlates of the intensity outcome in the female subsample; in the male subsample, as well as in the whole subsample of 65+ none of these categories correlate significantly with the intensity outcome. Running the F-test for joint significance (at the bottom of the table) shows that the categories of the “books” variable are jointly significantly correlated (at 5% level) with the outcome exclusively for the females 65+; it is not jointly significant for either entire 65+ subsample or the subsample of males 65+. Concerning the Early-Life Trauma, experiencing 1 or 3 traumatic events (in comparison to zero) are significant positive correlates of the outcome in the whole 65+ subsample, while 3 or 4 such events are significant in the female subsample; none are significant in the male subsample. The F-test for joint significance confirms that the categories of this variable are jointly significantly correlated with the outcome for both the entire 65+ subsample, and the one of females; it is uncorrelated with the outcome in the subsample of males 65+. Performing in math much better than the average (as compared to much worse than the average) is a significant correlate of intensity of the productive involvement in the male 65+ subsample (however, the F-test for joint significance showed that this variable is jointly uncorrelated with any of the subsamples). None of the other early-life variable, selected from SHARELIFE (language performance and living in the rural area) is a significant correlate for all the subsamples jointly or separately.

Other variables that correlate significantly (but differently for different subsamples of 65+) with the *intensity* of performed unpaid productive activities are as follows. The years of education variable is a significant correlate in the whole 65+, less so in the female one and not at all in the male subsample. None of the wealth quintiles is a significant correlate in any of the subsamples; however, the F-test shows that this variable is a significant correlate only for the males 65+. The expectation to receive bequest is a significant correlate for the whole 65+ subsample, as well as for the females 65+. It is not significant for men. The presence of 3 or more depressive symptoms in the last month is a significant correlate in the whole 65+.

as well as in the female, subsamples. Again, the association is positive, i.e. women (as well as the whole 65+) with such symptoms devote more hours to unpaid productive activities. The presence of a partner is a significant positive correlate of productive hours only for the male subsample; it is not significant either for the whole subsample of 65+ or for the females. The household size has a very significant association with the intensity of performing productive activities for both the whole subsample of 65+ and for the females; it is a bit less significant for the male subsample. The same can be said about the attendance of a social club. The number of children is also a very significant correlate of the intensity outcome for the whole subsample of 65+, while it is a bit less significant for the one of the males, as well as for the female subsample. Having a spouse with IADL limitation/s is a more significant associate of the intensity outcome for females (and the whole subsample 65+), than for males. Making vigorous sports is a significant correlate for intensity of involvement of females (and the whole 65+ subsample), and insignificant for the one of the males. The country dummies capture cross-country differences. For all the 3 subsamples, the variables equally significantly correlated with the intensity outcome are part of the list of correlates, cited above for the outcome of the number of activities, namely, attendance of a religious organization, involvement in the moderate sport activities and having a spouse with ADL limitation/s. Other regressors were found to be insignificant.

Table 7. TOBIT regression for **Intensity** of Productive Activities for Respondents aged 65+

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
<b>Intensity</b>			
<b>Books<sup>1</sup></b>			
2. 11-25 books	0.899 (1.007)	-0.797 (1.421)	2.588 (1.413)
3. 26-100 books	2.035 (1.122)	0.455 (1.607)	3.670* (1.556)
4. 101-200 books	2.694 (1.603)	-1.055 (2.254)	5.760** (2.234)
5. More than 200 books	2.924 (1.719)	1.274 (2.494)	5.013* (2.400)
<b>Early-Life Trauma<sup>4</sup></b>			
1 Kind of trauma	2.728* (1.140)	2.845 (1.600)	2.701 (1.607)



Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
2 Kinds of trauma	1.156 (2.693)	-1.739 (3.533)	4.484 (4.167)
3 Kinds of trauma	16.58* (7.721)	7.105 (10.06)	29.73** (11.20)
4 Kinds of trauma	31.18 (16.01)	9.54 (19.07)	62.26*** (3.225)
Math <sup>5</sup>			
worse than the average	-0.781 (2.975)	5.442 (4.435)	-4.616 (3.958)
about the same than the average	0.0114 (2.823)	7.391 (4.193)	-4.303 (3.764)
better than the average	1.164 (2.889)	8.028 (4.250)	-2.544 (3.887)
much better than the average	1.902 (3.029)	9.109* (4.450)	-2.157 (4.078)
Verb <sup>6</sup>			
worse than the average	-0.947 (3.582)	2.361 (4.594)	-4.385 (5.347)
about the same than the average	-2.177 (3.462)	2.045 (4.447)	-7.439 (5.125)
better than the average	0.392 (3.517)	4.488 (4.524)	-4.699 (5.207)
much better than the average	-0.623 (3.628)	2.025 (4.719)	-5.288 (5.326)
Rural_age10	0.816 (0.831)	-0.178 (1.201)	1.85 (1.152)
Edu	0.360** (0.116)	0.297 (0.155)	0.394* (0.173)
Wealth <sup>7</sup>			
2 <sup>nd</sup> quintile	0.165 (1.366)	1.08 (2.044)	-0.522 (1.832)
3 <sup>rd</sup> quintile	-0.251 (1.277)	-1.683 (1.858)	1.323 (1.751)

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
4 <sup>th</sup> quintile	2.134 (1.249)	3.593 (1.850)	0.666 (1.693)
5 <sup>th</sup> quintile	1.916 (1.437)	2.971 (2.106)	0.711 (1.974)
Expectation to receive bequest	0.0514** (0.0189)	0.0283 (0.0249)	0.0820** (0.0280)
Self-Perceived Health <sup>8</sup>			
2. Fair	1.478 (1.708)	0.235 (2.602)	2.149 (2.267)
3. Good	1.511 (1.728)	1.876 (2.613)	0.91 (2.304)
4. Very good	1.716 (1.887)	0.764 (2.833)	2.971 (2.523)
5. Excellent	1.56 (2.084)	0.967 (3.066)	2.177 (2.848)
Depressive symptoms	2.918** (1.053)	0.887 (1.784)	3.668** (1.317)
ADL or IADL	-1.539 (1.131)	-1.094 (1.786)	-1.819 (1.467)
Male	-3.617*** (0.868)		
Age	0.982 (1.384)	1.552 (2.213)	-0.428 (1.770)
Age2	-0.0124 (0.00927)	-0.014 (0.0149)	-0.00471 (0.0118)
Spouse	1.523 (1.145)	4.690* (1.872)	-1.411 (1.489)
hhsz	3.974*** (0.693)	3.038** (1.096)	4.808*** (0.910)
nchild	1.162*** (0.278)	1.146** (0.425)	1.104** (0.367)

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample	
Social Club	3.810*** (0.861)	3.500** (1.175)	4.277*** (1.248)	
Religious Organization	7.917*** (1.047)	7.540*** (1.654)	7.958*** (1.363)	
ADL Spouse	20.91*** (1.881)	19.63*** (2.535)	21.54*** (2.767)	
IADL Spouse	8.413*** (1.487)	5.754** (1.882)	11.82*** (2.348)	
Ever smoked	-0.307 (0.824)	-0.0672 (1.116)	-0.83 (1.241)	
Alcohol	-0.00259 (0.102)	0.025 (0.123)	0.0231 (0.176)	
Vigorous Sport Dummy	4.131*** (0.842)	2.039 (1.231)	6.077*** (1.151)	
Moderate Sport Dummy	7.441*** (1.521)	7.938*** (2.390)	6.771*** (1.975)	
Rural_d	-0.891 (0.920)	-1.585 (1.284)	-0.113 (1.307)	
Country <sup>9</sup>				
	DE	4.354 (2.518)	6.279 (3.541)	2.833 (3.537)
	SE	6.751** (2.541)	5.09 (3.620)	8.660* (3.538)
	NL	6.300* (2.478)	5.728 (3.503)	6.786* (3.457)
	ES	5.495 (3.061)	1.796 (4.311)	9.239* (4.307)
	IT	10.44*** (2.622)	6.557 (3.659)	14.72*** (3.711)

Variable	65+ Subsample	Male, 65+ Subsample	Female, 65+ Subsample
FR	4.587 (2.594)	4.256 (3.694)	5.44 (3.602)
DK	6.873** (2.560)	6.97 (3.643)	7.372* (3.565)
GR	6.087* (2.700)	3.725 (3.886)	8.210* (3.702)
CH	2.833 (2.702)	2.52 (3.907)	3.882 (3.703)
BE	9.812*** (2.454)	9.279** (3.513)	10.74** (3.390)
CZ	-1.057 (2.786)	-3.36 (3.985)	1.497 (3.838)
PD	-0.112 (3.097)	-1.765 (4.263)	1.879 (4.395)
Statistics			
N	8791	3989	4802
Pseudo R2	0.024	0.018	0.032
F-test	Prob > chi2	Prob > chi2	Prob > chi2
Books	0.2408	0.8500	0.0408
Early-Life Trauma	0.0180	0.2641	0.0157
Math	0.4789	0.2614	0.4728
Verb	0.1387	0.4784	0.1661
Self-Perceived Health	0.9255	0.7935	0.5675
Wealth	0.2309	0.0250	0.8847

Legend: \* p<.05; \*\* p<.01; \*\*\* p<.001;

Standard errors in parentheses

Reference categories: 1. 1. 0-10 books; 4. No trauma; 5. Much worse than the average; 6.

Much worse than the average; 7. 1<sup>st</sup> quintile; 8. 1. Poor; 9. AU

## 6. Discussion

It is crucially important to clarify whether aging and retirement pose potential threats to society, as well as to the older individuals themselves due to their exit from the labor market. For that reason one needs to account for *a broader range of productive activities* performed

by older citizens outside the labor market, and not only for their workforce participation. Although the issue of elders' engagement in unpaid productive activities has received considerable attention in the social science literature, few studies have addressed the question whether disparities in accessibility to capitals over the life course correlates with older people's capability of engaging in 'productive activity.' To close this gap in the literature I suggest using the *life-course perspective* approach and a model that explains involvement in the volunteer activities, developed by Wilson and Musick (1997). I show that this model is well suited for the sample of the population that I review (65 and older). I hypothesize that older adults, who had better early-life conditions are also more productive. In particular, people are more productive if they: 1. have inherited higher "cultural capital" from their family of origin, 2. have a better mathematical ability (as a proxy of genetic endowment) and 3. lived through favorable historical and institutional circumstances. Main findings from the analysis of a sample of Europeans aged 65 and over show a partial support for the hypotheses.

As to the 1<sup>st</sup> hypothesis, namely that older adults, who inherited better cultural resources are also more productive, the findings are in general confirmative. Particularly, the analysis showed that being a descendant from a family with higher **cultural** resources — measured by number of books at home at the age 10 and language performance — was positively correlated with higher productive involvement among people aged 65 and older, and particularly among the subsample of women. The "books" variable was found to be a significant correlate also of the *intensity* of productive activities, but exclusively in the female subsample of 65+. At the same time, these two variables are not significant correlates for the subsample of men. As to the books at home, the finding might be a possible outcome of two reasons. First, the social status of females at least 65 years ago was such that having books at home represented a considerable advantage, while men had other social opportunities for increasing their work-related capitals. An additional explanation might be that female children are more likely to take advantage of having books and indeed had read them, while male children at age 10 did not use this opportunity, while taking advantages from engagement in other sports.

Second, as to having a better mathematical ability, this variable is not a significant correlate of the productive outcomes. It is possible that this variable does not capture the genetic endowment in a proper way. I address this issue below, when discussing the limitation of the current study.

Third, as to the Early-Life Trauma, a variable constructed to reflect historical or institutional early-life circumstances, and is arguably unrelated to familial resources, is significantly and positively correlated with the productive outcome for both the entire 65+ subsample, and the one of males; it is also positively correlated with the outcome in the subsample of females 65+, but only at a 10% level. As to the intensity of the productive involvement, the Early-Life Trauma is significantly positively correlated with the outcome for both the entire 65+ subsample, and the one of females; however, it is uncorrelated with the outcome in the subsample of males 65+.

The positive sign on the coefficient of this variable contradicts the hypothesis of the current study. This finding points out to a possibility that people, who survived adversity early in life, such as living in a children's home, relocation during a war, or prisoner of war camp, apparently were not weakened, but rather became stronger to continue working after 65. It also might point out that those, who were able to endure the trauma and survived it, are more suited for work after 65.

I interpret these findings as an evidence for the assertion that Early Life Conditions matter for individual capability of older people to engage in 'productive activity. As was explained in the chapter on theory, economic literature already showed that skills are formed by the interplay of the early childhood environment and genes to produce cognitive and non-cognitive skills. In particular, the formation of cognitive and socio-emotional skills is a function of the transfers from the family of origin. It has been already shown in the literature that these transfers from the family of origin at early ages are a key determinant of the economic and social success of children at an adult age (Mazzonna 2014: 26). Brunello *et al.* (2012) argue that access to books when young reflect home skill formation in cognitive and socio-emotional skills, which has been already identified as an important factor of economic success in life. The current paper takes this claim one step further and shows that the influence of the transfers from the family of origin goes beyond the adult outcomes to influence the older adults' unpaid productive involvement (which is a component of 'successful aging' (Youssim *et al.* 2015). The findings are also consistent with Bourdieu's assertion that the power and ability to act in the social world stem from the possession of different capitals accumulated by and transmitted from one generation to the other within the social groups. These capitals may take different forms and human action is guided not only by (inherited) economic opportunities and constraints but also by cultural capital, that is, one's habitus or inherited repertoire, from which individuals build lines of action. Bourdieu

particularly has emphasized the formative role of the early life stage, claiming that practice is produced by the “embodied predispositions” of a person to behave in ways meaningful for her or his native social milieu (Bourdieu 1990, 59). This is fully in line with Mazzona (2014), who includes among the endowments cognitive ability, physical appearance, attitudes, and family connections as well as cultural and genetic traits. As to the transmission of attitudes, the current study conjectures that the variables, reflecting the early-life cultural transfers, capture such values (aspects of culture that are relevant for involvement in optional productive activities) as being truthful, fair and responsible (Wilson and Musick, 1997), as well as those, identified by Weber (1958), namely valuing hard labor and avoiding idleness.

The study also addressed some other assumptions following from my interpretation of the model suggested by Wilson and Musick (1997), as well as from the other literature. The current investigation found evidence regarding gender-related differences in correlation between the adult outcomes and the late-life productive involvement. The most salient ones are as follows. As to the extent of the performed activities, the wealth variable is associated more significantly with this outcome in the male subsample, while for females health is a significant correlate (insignificant for males). The presence of 3 or more depressive symptoms in the last month is positively and significantly associated with both productive outcomes in particular in the female subsample. This finding is consistent with the claim, found in recent research that depression may encourage helping in later life. It is because “Helping others” (or giving instead of receiving) is one way to fight loneliness or depressed affect (Li and Ferraro, 2006). It is also possible to interpret this finding as a reverse causality (Brandt, 2013). In particular, Brandt claims that time consuming help creates an intense burden for the givers, which significantly undermines their mental health.

The current study is pioneering and for that reason has several limitations, which also represent potentials for future research. The suggested empirical approach does not address some issues, which should be dealt with in further elaborations of the current investigation. Below I discuss two such concerns. The 1<sup>st</sup> one is possible endogeneity. As literature has claimed, one’s cognitive and non-cognitive skills are formed by the interplay of the early childhood environment and genes. If my measure for the genetic endowment, which is mathematical performance at 10, is not a good proxy for initial genetic endowment (this component might be partly/wholly inherited from the family, but also perhaps reflects own biological idiosyncrasy of a person), then genetic endowment is an omitted variable (suggested by the literature). In other words, genetically transmitted and unobserved

“ability” that has its origin in parents is affecting both the early familial milieu, as well as later life outcomes. In this case the early familial milieu variables (“books,” language performance and area of residence) are not exogenous, and correlate with the error term. As discussed in the Appendix, there is evidence from the data, showing that mathematical performance does not correlate with the parents’ occupational achievement. This lack of correlation between math performance and the parental occupational status gives some strength to my initial assumption that it is less dependent on the family SES, since apparently it is a factor that has to do with own biological (or even genetic) idiosyncrasy. On the other hand, the significance of association between Parental Occupations and verbal abilities (see the F-test at the bottom of the Table 8 in the Appendix) is in accordance with Bourdieu’s view, who claimed that language proficiency reflects the cultural baggage of the family of origin.

Another potential source of endogeneity is schooling. It is widely acknowledged that the variable ‘years of schooling,’ employed in the current specification is a choice variable. It may correlate both with productive involvement and unobservable ‘ability.’ To avoid this endogeneity problem, the common practice is to use state-promoted reforms as to the compulsory years of education as an instrument for the self-reported micro-level survey variable (Brunello *et al.*, 2012). A final example is wealth. In the same manner as education, it can correlate with both the outcome and the unobserved ability. All these issues must be addressed in a warranted investigation.

In addition to endogeneity problems, in his paper Mazzonna (2014) warns about two identification issues, following from the current estimation strategy. First is the panel attrition, since my investigation requires retrospective information, I use SHARELIFE database, which is the third wave of SHARE. Unfortunately, not all wave 2 respondents were reached in the subsequent wave, and the percentage of such respondents, for whom SHARELIFE information is not available, is quite significant. We cannot exclude that the attrition is not random, but is correlated with our variables of interest. To address this predicament, Mazzonna (2014) used a semi-parametric two-step selection model. The second identification problem is ‘selective mortality’. As with panel attrition, I cannot rule out that people, who die during the longitudinal study, don’t die at random, but rather death or survival are correlated with my study variables. As the *endogeneity considerations*, discussed above, the *identification issues* must be necessary addressed in a further investigation.



Despite the limitations, the current paper presents a support for the hypothesis that disparities in accessibility to capitals over the life course correlate with older people's capability of engaging in 'productive activity.' In particular, if we focus on the whole 65+ subsample, and in particular on the one of the females aged 65 and older, we find that the native social milieu as well as early-life institutional circumstances continue to correlate with engagement in a broad range of unpaid productive activities, performed by older adults, all else being equal.

This fact has several consequences. First, to be a successful player in the emerging social field of productive aging, there might be a need to possess resources, part of which come from early life and therefore are unequally distributed in the population. Second, from the policy-making point of view this suggests that older adults' productivity cannot be easily modified by old-age interventions. Brunello *et al.* (2012) claim that "cognitive abilities become stable around the age of 10, suggesting that environmental conditions below this age are important; and that early policy interventions pay off more than later interventions" (p.12). Thus, my findings contribute to the literature on the importance of early life interventions. In his article Mazzona (2014) explains that to be effective, public policies should put greater emphasis on early life interventions, because they are crucial for the subsequent evolution of abilities. This author cites recent empirical evidence, which indicates that the extent to which parental skills are transmitted to their offspring is a function not only of fixed "genetic rules", but also of cross-country differences in public policies. The latter statement also suggests that analysis on the macro-level is also warranted for understanding differentials in 'productive ageing'.

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## Appendix

### *RE-DEFINING THE MODEL: Reconsidering the Early-Life Components*

I also considered such measures as the occupation of the main breadwinner and the number of facilities in the accommodation at 10 (fixed bath, cold and hot running water supply, inside toilet and central heating). SHARELIFE asks respondents about the occupation of main breadwinner when ten. I recoded these categories of professions into a scale, consisting of 3 categories, as in Brunello et al. (2012): white collar (legislator, senior official, manager, professional, technician or clerk); service worker (service worker, market sales worker, skilled agricultural or fishery worker, craft worker); and elementary occupation (plant operator or assembler, elementary occupation). I recoded the “Armed forces” into missing values (their number was very small, 344 respondents, or 1.49% of the sample). The SHARELIFE questionnaire also contains a question about facilities in the accommodation at the age 10. These include: fixed bath; cold running water supply; hot running water supply; inside toilet; or central heating. I create a variable that counts how many of those a respondent had.

A few multivariate analyses on different subsamples of SHARELIFE, combined with the SHARE wave 2 data, led to the following conclusions. After controlling for many variables, parental occupations and facilities at home at age 10 are not correlated with the number of productive activities that a respondent reports. My guess is that the strength of their correlation is absorbed by the number of books at 10 and by own education. The Spearman’s rho between number of facilities at home, when 10 and the “books” is 0.55\*\*\*; and between the “facilities” and the years of education is 0.44\*\*\*. High correlations between the occupation of the main breadwinner and some of the other early-life conditions, as well as years of education, are documented in the Table 8 below. Although t-test on each category of language proficiency shows no significant correlation, the F-test shows significant joint correlation. Contrary to what I have been expecting, also the Early-Life Trauma was found as a significant correlate of the Parental Occupation pyramid, however not as strong, as other variables (earlier I suggested in the proposed specification that the Early-Life Trauma is independent of the parental status and has much more to do with the early-life *historical/institutional* events). A separate test, however, shows that the number of books and

the trauma are uncorrelated, as was suggested above. The early-life variables that are not correlated with the Parental Occupation pyramid are mathematical ability and area of residence at the age of 10. The lack of correlation between math performance and the parental occupational status, gives some strength to my initial assumption that it is less dependent on the family SES, since apparently it is a factor that has to do with own biological (or even genetic) idiosyncrasy. On the other hand, the significance of association between Parental Occupations and verbal abilities (see the F-test at the bottom of the Table 8) is in accordance with Bourdieu's view, who claimed that language proficiency is a function of the family of origin. As expected, there is a high correlation association between Parental Occupations and the Own Education of the respondents. As a consequence, I suggest dropping out from the models the variables: parental occupations and facilities at home at age 10.

Table 8. Ordered Probit for Parental Occupations

Variable	Parental Occupations
Books <sup>1</sup>	
2. 11-25 books	0.228*** (0.0324)
3. 26-100 books	0.532*** (0.0387)
4. 101-200 books	0.999*** (0.0644)
5. More than 200 books	1.326*** (0.0718)
N of Facilities at home, age 10 <sup>3</sup>	
1 Facility	0.0197 (0.0331)
2 Facilities	0.0950* (0.0379)
3 Facilities	0.331*** (0.0492)
4 Facilities	0.446*** (0.0589)

Variable	Parental Occupations
	5 Facilities 0.612*** (0.0585)
Early-Life Trauma <sup>4</sup>	1 Kind of trauma 0.105** (0.0377)
	2 Kinds of trauma 0.00697 (0.107)
	3 Kinds of trauma 0.623 (0.346)
	4 Kinds of trauma 0.143 (0.687)
Math <sup>5</sup>	worse than the average 0.182 (0.0931)
	about the same than the average 0.112 (0.0889)
	better than the average 0.0782 (0.0908)
	much better than the average 0.130 (0.0970)
Verb <sup>6</sup>	worse than the average 0.159 (0.116)
	about the same than the average 0.232* (0.113)
	better than the average 0.269* (0.114)
	much better than the average 0.274* (0.119)
Rural_age10	0.0451 (0.0262)

Variable	Parental Occupations
Edu	0.0225*** (0.00342)
Statistics	
N	9465
Pseudo R2	0.1025
F-test	Prob > chi2
	Books 0.0000
	n_fac 0.0000
	Early-Life Trauma 0.0282
	Math 0.1321
	Verb 0.0376

Standard errors in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Reference categories: 1. 0-10 books; 3. No facilities; 4. No trauma; 5. Much worse than the average; 6. Much worse than the average





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**Paper 2:**

**Uncertainty in Private Inter-Generational Transfers of Money  
and Time**

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An analysis based on SHARE micro-data survey

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**By Iaroslav Youssim**

Supervisor: Professor Guglielmo Weber

ABSTRACT: The current study contributes to the burgeoning literature on private downward intergenerational transfers of money and time in the Western countries. Building on the research, which finds support for the exchange motive of such transfers, this study further investigates determinants of the parental decision to transfer money. The empirical analysis is based on variables from three waves of SHARE, 14,889 parent-child dyads from 12 European countries. After discussing the risky nature of the exchange, I find that this decision to transfer money is dependent on the measures of current and childhood social status of the parents. This is congruent with the findings in the literature on trust that people from higher social status are less likely to be cheated; and that the people, who expect less to be cheated, are more willing to participate in risky transactions. This finding suggests that the parental decision to transfer money is determined by estimated uncertainty regarding the likelihood that the financial transfer will be reciprocated by children, who are expected to provide services later in life. Moreover, the study supplies an empirical support for the idea that this decision is informed by parental knowledge about the cultural norms characterizing their family.

## 1. *Introduction*

Cox (1987) claimed that “Private income transfers are becoming increasingly recognized as a key aspect of the U.S. economy.” In economics private intergenerational transfers were extensively discussed in the studies of the life-cycle model of consumption and saving because of their role as a possible source of savings (e.g., Modigliani, 1988; Kotlikoff, 1989). Later Hurd *et al.* (2007) integrated the private financial transfers into their life-cycle model of consumption and saving, treating them as a consumption item. Moreover, recent studies of the intergenerational transfers over the life cycle have assigned even higher importance to all the generations and family members involved. This is especially so following the wide-ranging recognition of the unprecedented challenges posed to the Western Welfare State by the demographic trend of the population aging (Mason *et al.*, 2006).

Looking at the relationships between older adults and their grown-up children, economic literature suggested two competing theories to explain what motivates the inter-vivos financial transfers, as well as care provision between generations. One explanation is *altruism* (e.g. Becker, 1974); under this hypothesis an altruistic parent grants financial gifts to her child, because she cares about the child’s well-being. An alternative explanation stresses the importance of the *exchange motive*. For example, in his empirical study Cox (1987) found support for the claim that “inter vivos transfers are payments for services that are exchanged among family units.” Both motives were modeled and testable predictions were derived and examined empirically. A good number of existing empirical studies have demonstrated that the *exchange model* is a very important explanation of the financial transfers from parents to children (Alessie *et al.*, 2013). While the importance of the exchange motive is thus generally acknowledged, I am not aware of research that seriously considers the *uncertainty* that any exchange might involve. This is, thus, the first research that combines further investigation of motives of the private inter-generational exchange with a close look at the mechanism underlying it.

This research gap requires attention for the following *theoretical* and *methodological* reasons. Firstly, if financial transfers from parents to children are motivated (even only

partly) by the exchange motive, then there always exists a positive probability that the child will fail to reciprocate the monetary gift, received earlier in life, by not providing the services (such as care, visits, etc.) expected by her parents later in life. Thus, obligations created earlier in life by giving financial transfers, might not be honored in the long run. Therefore, the current study suggests that parental assessment of the probability to get the expected service is important for her decision to transfer money. Hence, previous studies may thus have missed an important *determinant* of the transferring decision by the parents. Secondly, methodologically, the fact that the decision about a financial transfer is not made at random, but is driven by certain determinants, creates a sub-sample of givers, which is drawn from the wider population. Not accounting for this non-randomness may result in irremediable bias in the empirical estimation. Heckman (1979) suggested a procedure, which solves this problem. However, his estimator requires at least one *exclusion restriction*. Previous research on the current topic did not find any credible exclusion restriction, and therefore left open the selectivity issue, addressed by Heckman (e.g. Alessie *et al.*, 2011, 2013; Mudrazija, 2013).

My study contributes to closing the existing gap in three ways. First *theoretically*, in addition to using mathematical derivations, serving as testable predictions about the motives and determinants for the decision and the amount of time and money transfers, this study also seriously considers the uncertainty about the future behavior of the child. This uncertainty is considered to be crucially important for understanding the parental transferring decision. Second *methodologically*, this uncertainty would also serve as a perfect exclusion restriction for the Heckman selection procedure. The challenge is to find a proper proxy to capture it. Using studies about *trust*, I am able to propose variables that help to distinguish between the parents with high and low expectation that their transfer will be compensated by the services in the long run. Using the proposed exclusion restriction, I address the selectivity issue and, therefore obtain better estimates than the previous research. Third, this paper also contains an *empirical* innovation. While I use the same data source as Alessie, *et al.*, 2011, namely the Survey of Health, Ageing and Retirement in Europe (SHARE), my database is constructed in a different way. Specifically, unlike Alessie, *et al.*, 2011, who used only the 1<sup>st</sup> wave, I use wave 2 (2006) that is merged with the retrospective wave 3 (SHARELIFE, 2008), as well as with wave

4 (2011). Merging these three waves allows me to construct variables that do not exist in the 1<sup>st</sup> wave, but are indispensable for the proposed analysis.

## 2. Theory: A Model of Private Transfers

I use a mathematical model, first developed in Cox (1987), and later revised in Alessie, Angelini and Pasini (2011). This model explains both transfer behavior of parents and provision of care by children. It captures both the *altruism* and the *exchange* motive. The parent donates financial transfer to the child because she cares about the child's well-being. The child provides care to the parent in exchange of the transfer which she has received. For the sake of simplicity, the model implicitly assumes *credibility*: after receiving a financial transfer, the child will indeed provide services to parents later in life.

The parent's utility function has the following form:

$$U_p = U(C_p, s, V(C_k, s)) \quad (1)$$

where  $U_p$  = parent's level of well-being,  $C_p$  = parent's consumption,  $s$  = services provided by the child to the parent,  $V$  = child's level of well-being, and  $C_k$  = child's consumption. The assumptions are as follows. The parent cares about the well being of the child ( $\frac{\partial U}{\partial V} \equiv U_V > 0$ ), but also likes to receive services from the child ( $\frac{\partial U}{\partial s} \equiv U_s > 0$ ). The parent's utility function is strictly concave and all goods are substitutes, i.e.:  $U_{cc} < 0, U_{ss} < 0, U_{vv} < 0, U_{cs} \geq 0, U_{cv} \geq 0, U_{sv} \geq 0$ . The child's utility falls at an increasing rate as services increase ( $V_{ss} < 0$ ) and  $V_{cs} \leq 0, V_{cc} < 0$ .

The budget constraints are:

$$C_p \leq E_p - T \quad (2)$$

$$C_k \leq E_k + T \quad (3)$$

where  $E_p$  and  $E_k$  are incomes, respectively of the parent and of the child and  $T$  denotes transfers from parent to child.

Using this setting, Alessie, *et al.* (2011) prove that the amounts of services (or financial transfers), conditional upon the decision to provide service (or financial transfer), have the following relationships with the parent and child incomes. Under *altruism*:  $\frac{\partial s}{\partial E_k} > 0$ , that is: poorer children provide fewer services. In addition,  $\frac{\partial T}{\partial E_k} < 0$ : an altruistic parent should give more to children who have less (conditional on transferring). Under *exchange*:  $\frac{\partial s}{\partial E_k} < 0$ : poorer child will provide more services. Authors cannot sign  $\frac{\partial T}{\partial E_k}$  under the exchange setting. As to the probability of transferring money, the authors were not able to obtain the sign for the effect of  $E_k$ , while  $E_p$  was found to have a positive effect (pp. 10, 14).

These findings serve as testable predictions for empirical analysis. Concerning the *exchange motive* the following considerations should be taken into account. Under *exchange*, an additional prediction would be that the amount, given to the children, depends on the parent's assessment of her needs. Indeed, Szydlik (cited in Brandt, 2013: 28) found that "People who need support are more likely to receive help." Brandt (2013: 37) herself finds that "children react to the needs of their parents." Specifically, she shows that children are more likely to provide help to the parents, who are *older*, as well as to those, who have *worse the health* condition. Therefore, we may further hypothesize that parents in bad health today are more likely to believe that they might be disabled later in life. Also, parents, who are older, should transfer higher amounts.

My contribution in the theoretical field is relaxing the assumption of *credibility* in this model and introducing *uncertainty* about the future. Namely, I consider the probability, with which after receiving a financial transfer, the child will indeed respect the agreement and provide services to his parents later in life. The section below deals with the relationship between this uncertainty and the parental decision to transfer money. Unlike the *amount* of the transfer, which is determined by the mathematical model and the expected future needs, the uncertainty should matter for the transferring *decision*.

### *3. The Decision to Transfer Money under Exchange: Introducing Uncertainty*

Fehr (2009) observes that in their economic activities some of the most important risks that people face are *socially constituted* “such as the risk of being **cheated** by the trading partner or the risk of expropriation by politicians or corrupt civil servants” (p. 247). This author also claims that people are more willing to engage in a risky economic activity, which entails “a given probability of *bad luck* than to trust when facing an identical probability of being *cheated*” (p. 237). Moreover, it is necessary to realize that the risk might be even higher when financial capital is exchanged to obtain goods that don’t have obvious monetary value, such as the services, expected by parents from their children. These services, in the form of care or visits, phone calls and other forms of giving attention and time, are a consequence of having social capital. This capital might be conceptualized as favorable relationships with the children, leading to a set of “obligations that are usable in the more or less long term.” Therefore we deal with an attempt made by parents to use their financial capital to produce social capital. Furthermore, making financial transfers to obtain this kind of capital is necessarily characterized by the “declared refusal of calculation and of guarantees.” That is, in this case, usually when financial transfer is done, the involved parties deny that it was a payment for the future services. Hence, the transfer of money is typically made purposefully in such a manner that creates “nonguaranteed debts.” This, obviously, entails the risk of ingratitude, the refusal of recognition of such debts. “Everything which helps to disguise the economic aspect also tends to increase the risk of loss (particularly the intergenerational transfers)” (Bourdieu, 1986). Therefore, by construction, the exchange of money and time is risky due to three reasons. First, there is a long time gap between the transfers; the second reason is the nature of the exchange, i.e. it requires creating “nonguaranteed debts;” finally these services don’t have clear monetary value. It follows, then, that exchange of money and time between generations bring about a high degree of uncertainty or “*socially constituted*” risk. Hence, following reasoning of Fehr (2009), the first hypothesis of the current study is that when making the *decision* about the financial transfer to a child under exchange, the parent estimates the probability, with

which the child will indeed provide the service. If the estimated probability to be cheated is high, the parent might not be willing to engage in such an exchange.

While on the one hand private intergenerational transfers entail a high degree of uncertainty for the parent, on the other hand, the parent has an informational advantage, compared to her economic activities, which are not intergenerational. Namely, when making the transferring decision inside her family, the parent might exploit her knowledge about preferences, tastes, values and skills, characterizing her familial milieu, and particularly the ones of her children. First, the parent knows what cultural norms she transmitted to her children. Second, she also knows pretty well to what extent the children follow these familial norms. Therefore, the characteristics of the familial milieu might help the parent to make a better estimation of the extent to which the child will provide the services in exchange of the money transfer. In the economic literature Cox and Stark (2005) introduced the notion of the *demonstration effect*, which is transmission of a family norm. The authors also confirmed this hypothesis by empirical studies (see also Pezzin *et al.*, 2009). The demonstration effect is a testable case of transmission of culture from one generation to another. In particular, Cox and Stark (2005) suggested that in the setting of three overlapping generations, the middle generation (children) will provide services to the first generation (parents) only in the presence of the third generation (grandchildren). This is because in case that the third generation (grandchildren) is present and observing the demonstration, there exists a sizeable likelihood that these grandchildren will adopt the same behavior toward their parents later in life, when the second generation (the current helpers) will become old. However, if the third generation (grandchildren) is absent, the middle generation does not have any incentive to help their older parents, because there is no one to teach about the duty of providing help to the older adult. Following this discussion, I suggest to take into consideration the idea that the norms that are transmitted inside families are important for helping the parent, who engages in exchange of money and time, to estimate the risk that the child will renege on created “nonguaranteed debts.” To summarize, the second empirical hypothesis of the current study is that while private intergenerational exchange of money and time involves substantial risk for the parent, knowing values at home or



characteristics of the familial milieu might be another important determinant of the parental transferring decision.

#### *4. Analytical Strategy*

When estimating the decision and the amount of financial transfer, the ideal empirical strategy would be using the Heckman selection procedure. Heckman (1979) suggested a two stages estimator to correct for the bias that results from using non-randomly selected samples to estimate behavioral relationships. The fact that the decision about financial transfers is not made at random, but is driven by certain determinants, creates a sub-sample of givers, which is drawn from a wider population. This may result in the error term being correlated with explanatory variables, causing bias even asymptotically (see Hoffmann and Kassouf, 2005). The Heckman's approach solves this problem. However, it requires at least one variable that affects the decision, but does not affect the amount transferred. This variable is called *exclusion restriction*. Finding a good exclusion restriction is not an easy task. As was mentioned above, when making empirical estimation of the predictions following from their theoretical model, Alessie, *et al.*, 2011, 2013 could not find an exclusion restriction; therefore they used the two-part model, rather than the Heckman selection procedure. Hence, they did not address the issue of the bias that might result from using non-randomly selected sample.

Following from my first hypothesis, a perfect exclusion restriction for the Heckman selection procedure would be the uncertainty, i.e. the probability expected by the parent, with which the child reneges on the contract. This provides the motivation for the exclusion restriction. However, it is necessary to find a proper measure for this. I use research on trust to suggest a proxy for the exclusion restriction. Namely, Glaeser, *et al.*, 2000 found that people with higher *social status* have an ability to elicit trustworthy behavior from other people. Hence, from this research on trust it follows that *the parents with higher social status are more likely to transfer*. The social status, on the other hand, has nothing to do with the amount that will be given, because, as was shown above, the amount depends on totally different parameters. In particular, as follows from the mathematical model, the amount of transfer depends on the proxy for the child's

permanent income, as well as on the future needs of the parent. If people with higher social status are less likely to be cheated (Glaeser, *et al.*, 2000), then according to Fehr (2009) they will be more willing to engage in this transaction.

Following this discussion, one of the possible candidates to serve as a proxy of the social status is a variable, available in the SHARE data, which is the number of books at home at the age of 10. This variable captures the social status of the parent's family of origin. This is because having many books 50 years back or more was a characteristic of a pretty high social status. However, using this variable (or other variables that reflect the Early Life Conditions of the parents) as a proxy for person's own social status poses a problem. Namely, it can be claimed that throughout the life-course this family of origin's characteristic might affect not only the own social status of the parent, but also his other personal properties. For example, it might also shape his general preferences, educational achievement, health or income. Therefore, it is not clear why the Early Life Conditions should affect only the probability, but not the amount in the Heckman procedure. That is why we need a "clearer" measure of the social status. Hence, I suggest using the *size of the social network* as an exclusion restriction. This variable reflects the *current* social status: number of people, with whom the parent discusses his important concerns; it is the number of confidants, who are willing to listen to the older parent, i.e. his degree of connectedness. It should be mentioned, however that Guiso, *et al.*, 2006 discussed *reverse causality* in research on economics and culture. The dimensions of culture inherited from previous generations (such as family history) are largely 'given' to individuals throughout their lifetimes (exogenous variables). Hence, these authors suggest that using such dimensions reduces the risk of the reverse causality problem in regressions that explore the impact of culture on economic outcomes. Therefore, in addition to the *size of the social network*, I also control for the social status in the family of origin (the number of books).

## 5. Data, Variables and Descriptive Statistics

My basic data source is the second wave of the Survey of Health, Ageing and Retirement in Europe (SHARE). SHARE is a multi-disciplinary, cross-national panel

survey that is representative of the population aged 50 and over in a number of European countries. The survey provides micro data on health, socio-economic status and social and family networks (Börsch-Supan, *et al.*, 2008). In particular, it contains information on intergenerational time and money transfers between the respondents and their grown-up children. To create a data file necessary for my analysis, I merge the wave 2 with the wave 3 (SHARELIFE), as well as with wave 4. SHARELIFE contains retrospective data across the entire life course in Europe over the past century, which relates in particular to such areas as childhood living conditions, or family history (Schröder, 2011). Wave 4 contains a new *social network module*, which collects detailed information about social networks of the respondents. I reshape this dataset to create a dyadic (or child-level) file, like in other similar studies (e.g. Alessie, *et al.*, 2011 or Brandt, 2013). In such a file, the observation is a parent–child dyad, rather than the respondent (i.e., parent). These reshaped data allow me to control not only for the respondents’ characteristics, but also for ones of their children, who might participate in the exchange of time and money. In particular, information about each child is unique, while the respondent’s data is repeated for each child in the same household.

In SHARE, analogous to other similar surveys, the first respondent of an eligible couple is designated as a “family respondent.” This person provides information about the couple’s children. The detailed information on child characteristics is collected in SHARE only for up to four children, therefore my subsample does not contain parent–child pairs for which the detailed information on children was not collected (the number of households with more than 4 children is, however, negligible). Moreover, I also exclude all dyads in which children were younger than 18, because my analysis focuses on parents and their adult children. Next, I restrict my sample only to the children, who do not live in their parents’ household. Finally, I excluded from my analysis the step-children (see Alessie, *et al.*, 2013). The resulting analytic sample contains 14,889 parent–child dyads from 12 countries: Sweden, Denmark, Germany, Netherlands, Belgium, France, Switzerland, Austria, Italy, Spain, Czech Republic and Poland.

## 5.1 Dependent Variables

I consider two dependent variables. One is the proportion of the respondents, who gave financial transfers to their children. This is a dummy variable equal to one in case a parent gave a positive financial transfer to her children and it is equal to zero otherwise. In the 2<sup>nd</sup> wave of SHARE the respondents were asked, whether in the twelve months prior to the interview they have given financial transfers amounting to 250 euros or more to someone, including the 4 children, for whom I have the detailed information. If the answer was positive, the respondents were asked about the size of the transfer. Hence, my second dependent variable is the amount given to the children. In case the decision variable is equal to zero, the amount variable's value was set to missing, as required by the Heckman selection procedure. In addition, due to a skewed distribution, the amount variable was transformed using the inverse hyperbolic sine (IHS) transformation. IHS is defined as  $\ln(t + \sqrt{t^2 + 1})$ , and is approximately equal to  $\ln(2t)$  for positive values of financial transfers ( $t$ ). It is linear around zero (See Burbidge *et al.*, 1988).

## 5.2 Independent Variables

*Main Predictors.* As follows from the mathematical model, both outcome variables depend on the incomes of the parent and the child ( $E_p$  and  $E_k$ ). Since SHARE doesn't provide information about the children's income, we proxy  $E_k$  with the children years in full education ( $yedu_c$ ). This variable was derived, using the ISCED-97 coding, available in the 2<sup>nd</sup> wave of SHARE together with the country-specific tables that provide information about years corresponding to each ISCED-97 level in each country. Parent's income ( $E_p$ ) is proxied, using two variables: the current income ( $income_p$ ), as well as the years of education ( $yedu_p$ , which captures parent's permanent income). Similarly to the amount of financial gift, the current income of the parent was transformed, using the inverse hyperbolic sine.

*Other Regressors.* In addition to the main predictors, I also control for parents' health and a set of parents' and children's demographic characteristics. Parents' health is a dummy (called  $badhealth_p$ ), which is equal to one, if the parent's self reported health is worse than good. Besides, I control for parents' age ( $age_p$ ), gender ( $female_p$ ) and the

marital status (*married\_p*). In particular, the marital status is a dummy equal to one, if the parent is married or in a registered partnership. Gender is a dummy equal to one, if the parent is a female. As to the children, I control for the information, provided by the family respondent about his/her up to 4 children, on age (*age\_c*), gender (*female\_c*), marital status (*married\_c*), number of kids (*nchild\_c*) and the number of the child's siblings (*sibling\_c*). Children's variables are coded identically to the ones of their parents, however the last two (kids and siblings) are numbers. Finally, I put into the regression the countries' dummies.

*Social Status.* In accordance with my hypothesis, I also include into the analysis two additional variables to proxy the parent's social status. One is a proxy for the *current* social status of the respondent. This proxy is the number of people in the parent's social network, i.e. her degree of connectedness. This variable is found in the wave 4 of SHARE. I code this variable to be a dummy (called *Many\_Members*) equal to one if the parent has 4 to 7 members in her network; and 0, if she has 0 to 3 members (***Children are excluded from the Network Size***). In addition, I control for the social status of the parent's *family of origin*. This status is proxied by the number of books at home at the age of 10, supplied by SHARELIFE. I create a dummy (called *Many\_Books*), which assumes value of one if the parent had 26 to over 200 books (codes 3 to 5), and zero, if he had 25 books or less (codes 1 or 2).

The descriptive statistics of the variables, composing my specification, are presented in the Table 1 below. It should be mentioned that I still use only parental and child characteristics, while do not take into account also dyad and welfare-regime variables (that are suggested by similar research, as in, e.g. Brandt, 2013; Brandt and Deindl 2013; Mudrazija, 2013).

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
IHS of financial transfer	2726	8.1	1.39	5.3	13.8
Decided to give a financial transfer	14889	0.2	0.39	0	1
income_p	14889	10.6	1.21	0	13.9
yedu_p	14889	10.6	4.29	0	21
yedu_c	14889	13.1	3.24	0	21

age_c	14889	39.5	9.12	18	75
married_c	14889	0.8	0.41	0	1
female_c	14889	0.5	0.50	0	1
nchild_c	14889	1.4	1.24	0	23
sibling_c	14889	1.8	1.19	0	11
age_p	14889	67.8	8.92	50	98
married_p	14889	0.7	0.48	0	1
female_p	14889	0.6	0.50	0	1
badhealth_p	14889	0.1	0.27	0	1
Many_Members	14889	0.3	0.44	0	1
Many_Books	14889	0.4	0.48	0	1

## 6. Multivariate Analysis

I estimate the data with the Heckman procedure (Table 2). First I use the current social status of the parents as an exclusion restriction, while the childhood social status (*Many\_Books*) enters both the probit and the amount equations. Since *Many\_Books* in the amount equation is not significant, I exclude it in the second specification. Finally, I also ran the Heckman procedure separately for the subsamples of females and males. However, it seems that the reduced sample sizes don't allow achieving an appropriate estimation. Therefore, I don't show the latter results. I use columns (2) of the table below to interpret the results.

Table 2: The Heckman Selection Procedure

	(1)		(2)	
	Books in Amount Eq.		Books Excluded	
	Amount	Probit	Amount	Probit
<b>Many_Members</b>		0.136** [0.042]		0.136** [0.042]
<b>Many_Books</b>	0.164 [0.099]	0.102*** [0.029]		0.102*** [0.029]
income_p	0.409*** [0.095]	0.127*** [0.016]	0.309*** [0.062]	0.127*** [0.016]
yedu_p	0.091***	0.033***	0.069***	0.033***

	(1) Books in Amount Eq.		(2) Books Excluded	
	Amount	Probit	Amount	Probit
	[0.024]	[0.004]	[0.017]	[0.004]
<b>yedu_c</b>	0.050*** [0.013]	0.006 [0.005]	0.046*** [0.010]	0.006 [0.005]
age_c	-0.034** [0.013]	-0.016*** [0.003]	-0.022* [0.009]	-0.016*** [0.003]
married_c	-0.209 [0.111]	-0.125*** [0.031]	-0.12 [0.082]	-0.125*** [0.031]
female_c	0.135 [0.089]	0.095*** [0.025]	0.061 [0.066]	0.095*** [0.025]
nchild_c	0.004 [0.031]	0.01 [0.012]	-0.005 [0.026]	0.01 [0.012]
sibling_c	-0.346** [0.120]	-0.167*** [0.013]	-0.214** [0.076]	-0.167*** [0.013]
<b>age_p</b>	0.016* [0.007]	-0.001 [0.003]	0.017** [0.006]	-0.001 [0.003]
married_p	0.139 [0.086]	0.054 [0.031]	0.093 [0.069]	0.054 [0.031]
female_p	-0.124 [0.075]	-0.05 [0.028]	-0.084 [0.060]	-0.05 [0.028]
<b>badhealth_p</b>	0.202 [0.147]	-0.052 [0.054]	0.242* [0.126]	-0.052 [0.054]
Countries <sup>1</sup>				
SE	0.511* [0.235]	0.294*** [0.057]	0.312 [0.169]	0.294*** [0.057]
DK	-0.006 [0.133]	0.04 [0.054]	-0.033 [0.109]	0.04 [0.054]
NL	-0.113	-0.260***	0.092	-0.260***

	(1)		(2)	
	Books in Amount Eq.		Books Excluded	
	Amount	Probit	Amount	Probit
	[0.222]	[0.058]	[0.158]	[0.058]
BE	0.546*** [0.149]	-0.09 [0.057]	0.591*** [0.123]	-0.09 [0.057]
FR	0.109 [0.160]	-0.114 [0.059]	0.19 [0.127]	-0.114 [0.059]
CH	-0.007 [0.269]	-0.325*** [0.065]	0.249 [0.189]	-0.325*** [0.065]
AT	0.02 [0.262]	-0.232** [0.084]	0.19 [0.207]	-0.232** [0.084]
IT	0.597** [0.229]	0.240*** [0.066]	0.402* [0.165]	0.240*** [0.066]
ES	-0.237 [0.462]	-0.541*** [0.098]	0.192 [0.336]	-0.541*** [0.098]
PL	-0.882*** [0.205]	-0.119 [0.072]	-0.797*** [0.170]	-0.119 [0.072]
CZ	-1.109*** [0.244]	-0.269*** [0.064]	-0.891*** [0.177]	-0.269*** [0.064]
_cons	-0.32 [1.877]	-1.687*** [0.218]	1.768 [1.192]	-1.687*** [0.218]
mills				
lambda	2.086* [0.871]		1.075* [0.534]	
N	14889		14889	
lambda	2.086		1.075	
rho	0.938		0.676	
sigma	2.223		1.591	

Standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

1. Reference category: Germany (DE)



With respect to the *amount* equation, the most salient finding is that the children with higher income, as proxied by their years of education, receive higher amounts of the financial transfers from their parents. This contradicts the mathematical derivations, obtained from the theoretical model, for the case of altruism. Namely, an altruistic parent should give more to children who have less (conditional on transferring). Since (similarly to Alessie, *et al.* (2011) as well as to other studies) I find the opposite, the altruism hypothesis does not hold. Therefore, the amount equation suggests that the exchange motive is more probable explanation of the transfers. In addition, I find empirical evidence that the parents, who expect higher need of help in the future, as measured by being in bad health today, also give more money to their children. To remind, in the exchange setting, the monetary transfers are payments for the future services. Therefore, those, who expect to be in need of more help, should pay higher amounts. Finally, as was hypothesized, basing on other studies, the *older* parents transfer more money, since the old age is a proxy of higher needs (Brandt, 2013).

As to the *decision* to transfer money to the children, I find, as predicted by the mathematical model that parents with higher income are more likely to give. Concerning the variables of main interest for the current study, I observe that both proxies for the social status are important. When these variables are excluded from the amount equation, the coefficient of the inverse Mill's ratio ( $\lambda$ ) is statistically significant; this means that this exclusion was necessary to avoid the sample selection bias. Moreover, both variables are significant predictors of the probability to give financial transfers. These findings have several implications. First, I was able to take into account the selectivity issues and, hence, my analysis provides better estimation than the previous research did. Second, the contribution of both proxies of the parent's social status requires attention.

As to the measure of the *current* social status, the analysis shows that having many confidants leads to higher likelihood of making financial transfers to adult children. In the exchange setting, this transfer is made in expectation to be compensated in the long run by getting services from these children. Since, as was shown above, the intergenerational transfers are a risky exchange, this finding is in line with the literature on trust that showed that people from the high social status are less likely to be cheated, and hence are more willing to engage in such exchange. This reasoning suggests that the *size of the*

*social network* serves as a proxy for the probability to be cheated. And finally, this probability is the uncertainty about the future behavior of the child, which is a crucial determinant of the parental transferring decision. It is interesting that although the number of books at age 10 of the parent has no impact on the *amount*, it is an important *determinant of the transferring decision*, even after accounting for all other key predictors. This variable was used due to conjectured importance of control for exogenously given variables, distinguishing between people born to different social status groups, to account for possible reverse causality, as suggested by Guiso, *et al.*, 2006. However, it is essential to discuss, whether the number of books at age 10 might provide additional information, which is important for the transferring decision of the parents, rather than just being a proxy for the childhood social status.

## 7. Discussion

If private transfers of money and time between parents and their grown-up children are motivated (even only partly) by the exchange motive, we are observing an attempt to use financial capital to produce social capital. The present study views this exchange as a very particular field of intergenerational transfers, and emphasizes the importance of understanding its causal mechanism, namely the drivers of the transferring decision of the parents. Following from the importance of private intergenerational transfers for economics and policy, understanding the drivers of private exchange has essential implications.

The empirical findings point out that social status of the parents, as measured by current and childhood proxies thereof, is a significant predictor of the probability that the parents will make a financial transfer. This result supports the finding in Glaeser, *et al.*, 2000 that people with higher social status are less likely to be cheated and therefore (according to Fehr, 2009) are more likely to engage in risky exchange, because when making financial transfers they are more confident that they will be compensated by receiving services from their children later in life. Hence, I find an empirical support for my hypothesis that uncertainty in the field of intergenerational transfers of time and money is an important determinant of the transferring decision by the parents. Moreover,

the finding that the number of books at age 10 is a significant predictor of the probability to transfer provides support for the second hypothesis of this paper. Namely, this variable might also contain the information about the culture and norms transmitted between the generations of a family. As was discussed above, this information is necessary for the parent in order to estimate better the risk that the child will renege on “nonguaranteed debts” created by the financial transfer. And, therefore, this information is important for the parental decision to transfer. Here it might be instructive to look at the research by Brunello *et al.*, 2012, who found that the number of books at home at the age of 10 **captures the cultural background** (rather than the economic situation of the household). This research supports the idea that this measure might also contain a glimpse into the cultural heritage of the family, which is attempted to be transmitted by each previous generation to each successful one. The high significance it has for the decision of parent to transfer might point out not only at the social status, which is an important determinant of trust, but also at the information, available to the parent about preferences, tastes, values and skills, characterizing her familial milieu, and particularly ones that she was transmitting to her children. Exploiting this knowledge, the parent might make a better assessment of the extent to which the child is likely to provide the services in exchange of financial transfer.

Finally, some limitations of the current analysis should be mentioned (these limitations also serve as suggestions for the further study). In fact, this project is informed about the complexity of that issue. On the one hand, interaction of at least three players should be considered: the family, the (insurance) market and the (welfare) state (e.g., Brandt, 2013, p. 27). Brandt and Deindl (2013, 243-245) found that older people are an important source of financial support to their adult children; however the authors provide evidence that the decision and the amount of these transfers differ considerably between different European countries, depending on the countries’ social policies. In particular, to be able to better evaluate the consequences of policy interventions, it is important to account for the redistribution of resources at the family level that follows public redistribution. In addition, it is necessary to estimate the impact of policies on the redistribution of resources across generations. On the other hand, focusing only on the period, when the parent is about the retirement age, and the child is a young adult, might

also distort the estimation of the likelihood and the amount of financial transfers. For example, Bernheim, *et al.* (1985) found that care was provided by children in order to stimulate future receipt of bequests. In fact, research about flow of transfers between generations should account for both, the transfers across the life cycle (i.e. e.g. the investment of parents in young children, as well as the volume of a potential bequest), as well as their link with the type of a welfare regime. Such research is still limited. Thus, taking the life-cycle overlapping-generations perspective and comparing different welfare regimes is warranted (see Mudrazija, 2013). Hence, further study of the determinants of the parental decision about inter-vivos financial transfers should adopt the life-cycle overlapping-generations perspective, while also comparing different welfare regimes (as is suggested by the recent research).

In spite of these limitations, the current paper was able to introduce the notion of uncertainty into the theoretical discussion about the motives of private intergenerational transfers. This uncertainty was introduced as an important determinant of the parental decision to transfer money. It was shown that this uncertainty might serve as an exclusion restriction in the Heckman selection procedure, using which the current study obtains better estimates of the probability and the amount of financial transfers from parents to the children. The literature on trust was used to suggest proxies, capturing this uncertainty. These proxies provided support for the idea that when making transfers parents estimate the riskiness of the transaction. In addition, parents also use their informational advantage, i.e. the knowledge about the cultural norms in their family to make better prediction about the probability that their financial gift will be compensated by services later in life.

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**Paper 3:**

**Linguistic Communities and Financial Behavior of Older  
Adults in Europe**

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An analysis based on SHARE micro-data survey

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**By Iaroslav Youssim**

Supervisor: Professor Guglielmo Weber

ABSTRACT: This study compares financial behavior (holding stocks, bonds, mutual funds and/or individual retirement accounts (IRA)) of older adults, belonging to 10 different European linguistic communities: German-speakers in South Germany, German-speakers in Austria and in Switzerland; Italian-speakers in Northern Italy and those in Switzerland; French-speakers in East France, in Belgium and in Switzerland; and finally Dutch in the Netherlands and Flemish in Belgium. Previous research found profound differences in financial behavior among older adults across European countries. However, belonging to different linguistic groups in a country; or to the same linguistic group across different countries was usually neglected as a possible predictor of financial behavior. Recently many other noneconomic factors were found as important determinants of the household financial behavior of older adults, such as effects of social institutions and culture. However, the literature has missed the fact that belonging to different linguistic communities in Europe might serve as a proxy for a latent construct of having/lacking skills and values that are necessary for holding stocks, bonds, mutual funds and/or individual retirement accounts. Using the fourth wave of SHARE, I find first that for three kinds of financial instruments (holding stocks, risky assets and risky assets plus IRA) – after controlling for all possible determinants of private financial market participation – the behavior of the three linguistic communities in Switzerland and of the two communities in Belgium isn't the same, despite they face identical institutions. Second, in some cases (especially, concerning the French-speakers), the financial behavior of a language speaker can be identical, even when facing heterogeneous financial environment (i.e. the behavior is identical across countries). Thus, it is evident that language matters for private financial decisions – at least for some of the major European linguistic groups – even after controlling for a wide range of adequate variables.



## 1. Introduction

Limited participation of households (and in particular the older ones) in financial market represents a challenge both to the classical model of portfolio allocation, as well as to states' social security systems. In the recent decades Western countries experienced an extraordinary increase in availability of new financial products and services, such as mutual funds or individual retirement accounts (Hong *et al.*, 2004; Guiso *et al.*, 2003). However, a large body of empirical research documents that many individuals do not invest in stocks and other financial assets (Christelis, *et al.*, 2010; Campbell, 2006); while of those who do, many do not hold a diversified portfolio (Cardak and Wilkins, 2009). Many authors observe that limited financial market participation, particularly among the wealthy, is one of the great challenges to financial theory (e.g. Hong, *et al.*, 2004; van Rooij, *et al.*, 2011). They claim that the classical model is unable to explain individual *financial behavior* (holding stocks, bonds, mutual funds and/or individual retirement accounts). According to this model of portfolio allocation, having risky financial assets is a simple business. It assumes that investors are concerned only with the payoffs from their portfolios, with risk the only preference parameter; or assessing the “true” distribution of returns (Kaustia and Torstila, 2011). However, as many scholars point out, empirical evidence shows that households do not follow the portfolio theory's predictions (Cardak and Wilkins, 2009).

In addition, these findings are placed in the context of the discourse about state's social security systems. This discourse stresses challenges in provision of adequate social security coverage in face of increasing ratios of retirees to workers, resulting from the ageing of the population. There are concerns that households are not taking advantage of financial innovation, hence they are not saving enough for retirement and accumulate excessive debt (Lusardi and Mitchell, 2007; Campbell, 2006). As more workers face situation, in which they have to decide how much to save for retirement and how to invest their retirement wealth, it is important to consider ways to enhance their use of financial instruments (van Rooij *et al.*, 2011). Some scholars even maintain that it is an imperative for households to take advantage of asset accumulation opportunities during their working life (Christelis, *et al.*, 2011; van Rooij *et al.*, 2011). Specifically with

respect to the older households, it is claimed that inadequate social security coverage for retirees calls for having an additional retirement income from private pension and/or mutual funds (Guiso *et al.*, 2003).

The failure of the standard model of portfolio choice to account for limited financial market participation and undiversified portfolios, generated a growing body of research, which either develops models that explain and predict observed portfolios or empirically identifies factors explaining household portfolio allocations or some combination of the two (Cardak and Wilkins, 2009). In general, the literature has recently paid a lot of attention to the effects of noneconomic factors on financial behavior, such as institutions or culture. In particular, there are two main strands of explanation. One is that financial instruments, such as stocks or mutual funds are *not* a simple business, but rather complex assets, and many households may not know or understand financial instruments and the working of the financial market. Lack of understanding of new financial instruments is a significant barrier for their ownership. This explanation has not yet been well-explored in the literature (van Rooij, *et al.*, 2011). The second strand claims that investors have tastes for financial assets as in consumption goods. Such tastes (or values/opinions) could potentially explain the phenomenon of participation by factors like socially responsible investing (Kaustia and Torstila, 2011).

Many other noneconomic factors may also matter in understanding the household financial behavior, for example trusting the social environment (e.g. Guiso *et al.*, 2008). However, the research almost neglected such possible cultural determinant of participation as belonging to different linguistic groups in a country; or the behavior of the same linguistic group across different countries. The only exception is Chen (2013). Yet, this author tests a very specific hypothesis about the causal mechanism, namely that speakers of “the languages that grammatically associate the future and the present” save more and retire with more wealth. Thus, although considering language as a possible determinant of financial behavior, it relates to different outcomes than ones that I examine in the current paper. My paper instead sheds light on differences in financial market participation (holding stocks, bonds, mutual funds and/or individual retirement accounts IRA) among older adults from different European linguistic communities. As explained below in a more detailed way, I assume that speaking different languages

captures bearing distinctive cultures; and therefore can be used as a proxy for *the latent construct of* having skills and values that triggers or deters holding of financial assets.

Thus, this paper contributes to the growing literature which reflects the effort of economists to apply their analytical frameworks and empirical tools to study the cultural influences on economic decisions and behaviors (Guiso *et al.*, 2006; Nunziata and Rocco, 2010). After controlling for a wide range of adequate variables, I find that language matters for three types of financial behavior of people 50 and older: Stock-holding, holding Risky Assets (stocks and/or bonds and/or mutual funds) and holding Risky Assets and/or individual retirement accounts (IRA).

## *2. The Role of Linguistic Communities in Financial Behavior of Older Adults and the Research Question*

Recent research found that noneconomic (specifically, social and/or cultural) factors matter in understanding the household financial behavior. Section 2 provides literature review about cultural and social determinants of domestic financial behavior. First, however, I discuss theoretical literature on possible effects of social and cultural variables – one of which is belonging to a linguistic community – on economic outcomes.

Social variables reflect ways in which individuals are clustered into groups, which are different with respect to owning of knowledge, skills and values. Empirical studies have already found some differences in use of financial instruments with respect to some social variables. For example, literature finds remarkable variation in financial behavior among older adults, when using such social variable as country of citizenship in Europe (e.g. Georgarakos and Pasini, 2011; Christelis, *et al.*, 2013). See Figure 1.

Figure 1. Differences in Stock-Market Participation in Europe

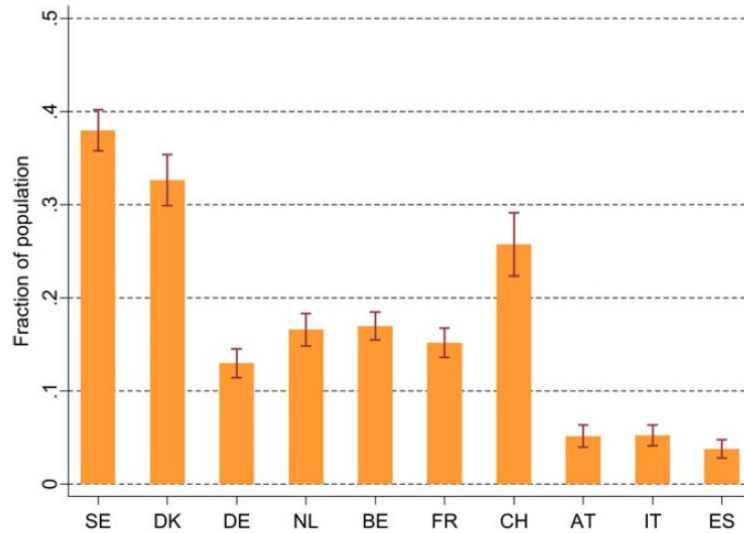


Figure 1. Direct stock ownership rates by country. The figure shows weighted statistics from SHARE 2004. The error bands represent 95% confidence intervals.

Source: Georgarakos and Pasini (2011)

According to the recent article by Haliassos , Jansson and Karabulut (2014), these differences should be a result of either **institutions**, or **culture**, however it is still not clear what is the relative importance of these two factors. Next I describe possible mechanisms through which culture and institutions may affect economic outcomes.

## 2.1 Culture

Landes cited in Guiso, Sapienza and Zingales (2006), states that "if we learn anything from the history of economic development, it is that culture makes all the difference" (p. 29). Culture is defined by Guiso, Sapienza and Zingales (2006) as "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (p. 23). This definition is focused only on those dimensions of culture that are inherited by an individual from previous generations. For that reason, they claim, it allows identification of a causal effect from culture to economic outcomes. Specifically, the authors state that in making many economic decisions (e.g. which college to attend, which profession to choose, how much to save for

retirement) people's choices must be based on beliefs (i.e., priors) and values (i.e., preferences), which are determined by culture (e.g. by religion or ethnicity).

### ***2.1.1 Which specific cultural attributes are important for economic outcomes and Why?***

Already in his early fundamental work *The Protestant Ethics and the Spirit of Capitalism* (1958) Max Weber claimed that belonging to religious denominations matters for economic behavior. The capitalist ethic is informed by the Calvinist idea (as opposed to Catholic) about one's election (salvation), which is a function of such behaviors as **hard labor**, avoiding **enjoyment of wealth, idleness**. Landes (1998) identifies cultural factors, such as **thrift, hard work, tenacity, honesty, and tolerance**, which he contrasts with xenophobia, religious intolerance, bureaucratic corruption, and laws that hurt economic development. He states that the former factors create attitudes that are crucial drivers of the states' economic prosperity. Nunziata and Rocco (2010) find that thriving entrepreneurship depends on characteristics (rooted in belonging to religious denominations), such as: **intuition, courage, self-control, leadership, propensity to invest**. Licht, Goldschmidt and Schwartz (2007) identify three opposite cultural factors that encourage or dampen respect of law, corruption, and democratic accountability. These opposite cultural factors are: "embeddedness" vs. autonomy, hierarchy vs. egalitarianism, and mastery vs. harmony with nature. The authors document that national economies derive success from autonomy, egalitarianism, and mastery.

Tabellini (2010) provides comprehensive empirical evidence on the effects of culture on economic development. He uses four measures of values and beliefs (such as **generalized trust, respect for others, and confidence in the virtues of individualism**) at the regional level in Europe. Then, he instruments these measures with historical variables. He finds that exogenous regional component of culture is correlated with the current economic development. Tabellini has established the following causal mechanisms from these four values to the economic outcome.

1. Tabellini makes a distinction between generalized trust versus limited morality (i.e. when trust is limited only to the local community). Individuals who practice

generalized (as opposed to limited) observe social norms also when dealing with citizens, whom they don't know personally (they are reluctant to free-ride on others). Therefore, in societies, characterized by higher generalized trust, the cost of external monitoring of transactions outside the local community is relatively low, thus facilitating the development of anonymous market exchange. Otherwise, limited morality leads to fear of fraud and raises monitoring costs, thus reducing gains from trade.

2. Societies, where members don't respect their fellow citizens, as well as society as a whole, public administration tends to exhibit more corruption, such as nepotism. This cultural feature of respect can be captured by the extent of citizens' participation in the political and administrative life of their society (or "res publica"). If participation is low, there is no adequate monitoring of public administrators. Consequently, this leads to worse functioning of the social institutions, which in its turn deter the development of economy.

3. In societies with rigid hierarchy the individual is regarded as responding to instinct rather than reason. Consequently, such societies tend to be coercive towards its members, therefore discouraging individual initiative and cooperation. As a result, entrepreneurial environment becomes inadequate, which hurts economic development. To capture this distrust of the benefits of individualism, Tabellini uses a survey question, which asks if respondents believe that children should learn to exhibit "obedience."

4. Individuals, who view success as direct outcome of their personal choices, are more likely to work hard, to plan for their future, to be innovative and undertake new initiatives. Consequently, they are usually highly motivated people. On the other hand, people who think that the success is out of their personal control, and is a result of external events, are more likely to adopt passive attitudes and exhibit low motivation to undertake economic initiative. For that reasons, Tabellini (and other authors) considers the variable of control (i.e. belief that individual effort pays off) as a cultural feature that may serve as a driver of economic development.

In sum, generalized trust and respect for others are expected to be correlated with higher benefits from anonymous exchange and with improvement in the functioning of societal institutions. The two latter variables measure confidence in the virtues of

individualism, hence reflecting quality of the entrepreneurial environment and willingness of citizens to look for and take advantage of economic opportunities.

### *2.1.2 Persistence of Culture?*

For Bisin and Verdier (2000, 2001) culture is an outcome of two factors: current social interactions and the cultural traditions inherited from earlier generations. Culture, shaped by social interactions (the so-called fast-moving components) is out of the scope of the current paper. However, in my model I control for variables that were found as proxies for social interactions. With respect to the inherited culture (the so-called slow-moving components), Bisin and Verdier maintain that parents have a natural tendency to teach their children what they have learned from their own parents, usually without an appropriate assessment of adequacy of this education. This corresponds to Bourdieu's claim that practice is produced by the "embodied predispositions" (or inherited repertoire of cultural attributes) of a person to behave in ways meaningful for her or his native social milieu (Bourdieu, 1990). Guiso, Sapienza and Zingales (2006) maintain that also **organizations** (such as governments, church, and academia) play a role in promoting culture. Therefore, they are able to shape values and beliefs that serve their interests (see the next section on Institutions). According to these authors, regardless of the exact mechanisms, the persistence of the slow-moving components of culture allows us to use such variables as ethnic origin, religious denomination or culture inherited from the previous generations as exogenous predictors of economic outcomes, i.e. avoiding the issue of reverse causality.

Finally, it should be mentioned that in recent years, researchers has put an extensive emphasis on studying the role of culture on cross-country disparity in economic outcomes. Quite a few studies have linked economic outcomes directly to the slow-moving components of culture. For example, country of origin (as a proxy for possibly different social preferences and beliefs) of immigrants to Canada was found to correlate with saving behavior (Caroll *et al.*, 1994). Being an ancestor of immigrants from countries with higher financial development is correlated in the US with higher probability to own a home, to work in the financial industry, and to take on more debt

(Bogaard and Pirinsky, 2011). Again, such immigrants are more likely to be self-employed than immigrants from less developed countries (Oyelere and Belton, 2012). Being US immigrant from countries with poorer investment protection is associated with higher averseness of shares, because in the new country these immigrants follow their old prior belief (Osili and Paulson, 2008). Lastly, Guiso, Sapienza and Zingales (2006) show that particular religious denominations affect thriftiness.

## ***2.2 Institutions***

Similarly to Guiso, Sapienza and Zingales (2006), Tabellini (2010) states that cultural traits can influence economic development also “indirectly through the functioning of current institutions” (p. 711). With specific reference to households’ participation in financial markets Guiso, Haliassos and Jappelli (2003) point out that macroeconomic processes (demographic, institutional, and policy-related), some of which appeared in the Western countries as early as 1980s, forced governments to aim at changing the citizens’ political culture. To achieve this goal the governments were able to reduce the entry costs to the stock market (such as distribution costs of institutional investors or information costs). According to the authors, these costs serve as factors that generate cross-country differences in participation. As a result of the costs’ reduction, the perceived barriers to stockholding were lowered relative to the expected benefits of stock market participation. This created incentive for relatively less wealthy investors to enter the market of risky assets. In particular, such European investors became able to hold diversified portfolios in stocks at much lower costs than through direct acquisition. These macroeconomic processes included: pension reforms, financial liberalization reforms, growth of the managed fund sector and wider availability of financial information.

1. As was already mentioned in the Introduction, the demographic transition and rising dependency ratios created a situation, in which the governments experience difficulties with providing adequate social security coverage for retired households. Therefore, the households were increasingly stimulated to have an additional source of retirement income from participation in stockholding through retirement accounts (occupational and/or individual). However, the retirees’ demand for such supplementary



retirement accounts differs across European countries. Since in some countries public pension schemes still play a dominant role, these countries are characterized by low participation in private pension funds.

Due to these developments the governments undertook measure to stimulate participation of the households in private retirement schemes by lowering costs. They offered extra incentives to the households, which accumulate stocks as part of their retirement accounts. The incentives included: reduced taxation, inducing employers to participate in the payments for future private pension of employees, and facilitating dissemination of information about stockholding. As a result the defined-benefit pension schemes (DB) became increasingly replaced by defined-contribution schemes (DC).

However, despite the increase in the size of institutional investors (such as pension funds) as a share of GDP in the recent decades, in some countries it is still too small in comparison to the size of the social security systems. For example, in France, Germany and Italy, the countries with the largest social security systems, the perceived importance of private pension funds is low, unlike the Netherlands, the UK and Sweden, where the role of public pensions is limited. Table 1 below provides summary on pensions systems in some of the European countries. It is instructive to look at the differences between the Netherlands and other Member States (MS) (Eichhorst, *et al.*, 2011).

Table 1. Pensions Systems in Several European Countries

MS	Pillar 1 Universal coverage, redistributive	Pillar 2 Occupational pension schemes
BE	DB	DC
DE	DB	DC
FR	DB	DC
IT	Old: DB	DC
NL	Flat rate	DB
AT	DB	DC

**Source:** Annex 1 to the 2009 Ageing Report (European Commission, 2008a), the OECD Report 2009, the OECD Report 2011 and the Joint Report on Social Protection and Social Inclusion (European Commission, 2010b).

2. Increasing financial integration, financial liberalization policy and coordination in Europe, mainly due to introduction of common currency, led to further availability of stocks to households. Namely, the costs were further reduced, while the households got an opportunity to invest in stock markets of other European countries either directly or through mutual funds. In addition, European public corporations became increasingly prone to cross-list in foreign exchanges. However, European households still tend to invest in stocks of their own countries' economies, rather than in the foreign (the so called 'home bias'). For example, Guiso and Jappelli (2002) document that until recently Italian households are still characterized by old tradition of "*holding their financial wealth in the form of transaction accounts or governmental bonds, and portfolios are poorly diversified*" (p. 251).

3. A very important development was the growth and technological advance in the industry of institutional investors (such as mutual funds or pension funds). These institutions became able to replicate the market portfolio and to provide better diversification (for example by adding foreign securities) for lower price than direct stock acquisition. In addition, they served to provide information, professional portfolio management and other services for households. Finally, they offer assets with lower risk, while holding expected return constant, thereby boosting participation.

Large funds enjoy economies of scale and exhibit lower ratios of operating expenses to fund assets, thus providing to their customers significant cost savings. On the other hand, smaller funds that in addition operate in concentrated industries increase distribution costs. Another factor that affects the cost is the mode of stock distribution, i.e. via banks as opposed to direct sales by brokers. For example, in France, Germany and Italy mutual funds were mainly distributed by banks, while in the UK distribution of mutual funds by brokers is very significant. Differences in the availability and size of institutional investors (such as mutual or pension funds) may explain different participation across countries.

4. Participation is also influenced by information-related barriers that arise from lack of transparency of financial institutions, as well as from limited financial knowledge of the households. Participation in the financial market involves high degree of delegation. Households with higher knowledge have lower monitoring costs, and therefore are more

likely to participate. The authors provide an example how this knowledge could be boosted by employer-sponsored seminars about the nature of the defined-contribution retirement accounts. Transparency of financial institutions is higher in the Netherlands, Sweden and Germany than in France and in Italy. As to financial, as well as computer literacy, France and Italy – the countries with the lowest participation – are ranked lower than Sweden and the Netherlands.

However, according to Fehr and Hoff (2011) institutions may affect households not only through creating new opportunities for potential investors, but in a much more subtle way. Namely, they claim that preferences are malleable to social influences. They cite literature, confirming that preferences may be influenced by the elicitation method, the mode of presentation of a problem, or by making an aspect of one's social identity more salient. Thus, institutions may shape peoples' preferences by influencing peoples' cognition, and therefore, the meaning of facts.

The authors provide evidence that individual preferences (i.e. values and opinions) are readjusted in response to changes in social institutions and other socially defined variables; and that such readjustments are central to the modification of economic behavior. The study of Henrich *et al.* (2010) shows that the preferences of individuals for fairness and for punishing unfair behavior intensify with the level of the society's market integration (measured as average percentage of calories that are purchased by households). In addition, Lindbeck and Nyberg (2006) show that the *size of welfare state* may affect parents' inclination to educate their children to work hard. This is because if the grown-up children suffer from economic hardship, the altruistic parents will want to help them. However, if the state bears the obligation to alleviate peoples' economic hardships, the parents don't need to care about children's work-related ethics.

### ***2.3 Institutions or Culture?***

As was mentioned above, the Eurozone experiences pressure for institutional harmonization, however given the importance of cultural predispositions for economic behavior, more skeptical researchers doubt the likelihood that the behavior will converge to allow the harmonization. In their recent paper, Haliassos, Jansson and Karabulut

(2014) claim that given considerable cultural diversity in Europe, it is crucial to understand whether or not disparities in financial behavior across the continent reflect cultural predispositions, and thus will remain stable also in the face of institutional harmonization. If they persist, harmonization of institutions across Europe may not be effective. Special policies might be needed to address diverse cultural behavioral tendencies in order to be able to implement the desirable reforms, to which European Union is striving for. Haliassos, Jansson and Karabulut (2014) address the following questions:

1. To what extent households' financial behavior is influenced by their cultural backgrounds?
2. Whether dissimilar financial behavior of diverse cultural groups will synchronize, when these households face identical institutional environment?

To test the feasibility of harmonization reforms in Eurozone, the study compares financial behavior of households that belong to different cultural backgrounds (immigrant and non-immigrant households) but live in the same country (Sweden) and thus face a common institutional and policy environment. This research's design helps to make sure that institutions are "imposed" on households of different cultural backgrounds, rather than "evolve naturally."

The authors group immigrant households in Sweden using two different approaches, one is genetic distance, and the second one is Hofstede's cultural dimensions. They find that statistically significant differences in financial behavior between immigrant groups and Swedish households persist, even after controlling for a wide range of households' characteristics. They make sure that these differences are not a result of discrimination against immigrants. They find that participation in assets depends on time that an immigrant spent in the country and to whether s/he participated in home country economic institutions at young age. The differences in financial behavior between immigrants and Swedish households, controlling for characteristics, diminish after sufficient exposure to host country's institutions and policies, even for those who spent the early part of their economic lives in their home countries. Finally, statistically significant differences remain across different cultural groups, even among those who have spent the longest time in the host country and even among those who have become

so assimilated that they adopted Swedish citizenship. Thus, the conclusion of the study is that both the cultural background and institutional environment are important determinants of households' financial behavior.

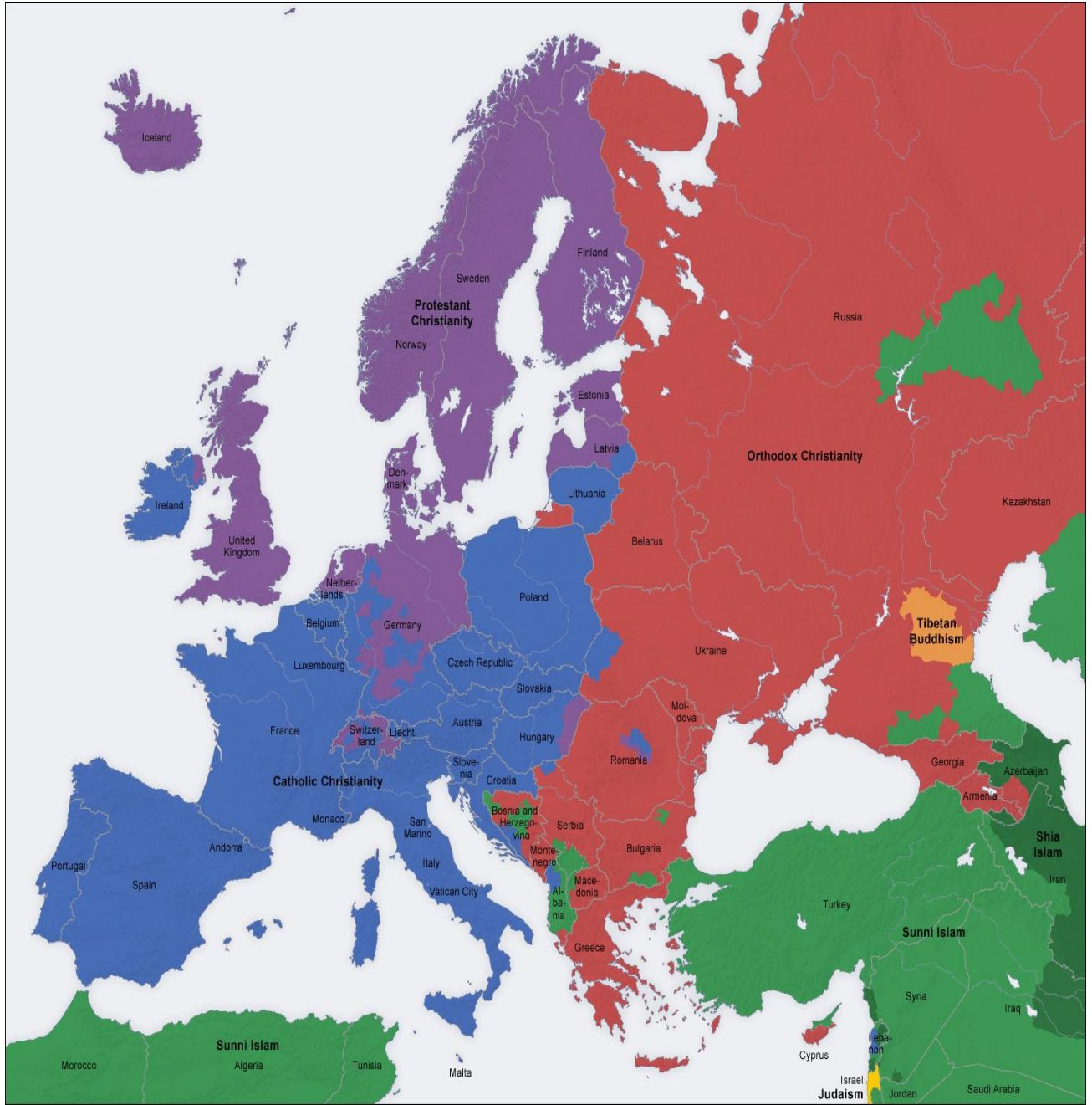
## ***2.4 Why belonging to different Linguistic Community in Europe should matter?***

European linguistic communities are interactions of languages (which capture cultural predispositions) and countries (which reflect institutional environments). Licht, Goldschmidt and Schwartz (2007) claim that “language and culture constitute one another, with language being the stable factor that constrains the development of cultural norms” (p. 661). In particular, languages, which require the explicit use of pronouns, like ‘I’ or ‘you,’ reflect more individualistic culture, which values autonomy. Conversely, languages, in which such pronouns are unnecessary, may suggest that the subject isn’t distinguished from the general context of his/her social group, thus pointing out on culture which favors “embeddedness” (p. 661). As was argued above, cultures that favor autonomy are characterized by such economically favorable conditions as greater rule of law, lower corruption, and better accountability of the institutions.

Here also Max Weber’s reasoning might apply, since the division between Protestants and Catholics in Switzerland is pronounced and corresponds to German as opposed to the French and Italian linguistic communities. As was stated above the Protestant ethics puts stress on such attitudes as hard labor and avoiding enjoyment of wealth, as well as idleness. Thus, in Switzerland German-speakers’ financial behavior might be different from the other communities. Many other cultural characteristics might also be captured by European linguistic communities. The current paper (see chapter 2.2 and Appendix I) uncovers thought-provoking patterns between European linguistic communities with respect to risk preferences, optimism, prevalence of volunteering behavior, participation in religious organizations, feeling of control over things that happen and religiosity (or intensity of trust in God).

With respect to countries' institutional environments, as an example relevant to the current study, according to Eugster, Lalive, Steinhauer, and Zweimüller (2011) Swiss institutional environment is characterized by identical universal supply of social insurance (*e.g.* unemployment insurance, the retirement system, maternity leave, etc.). In addition, the wealth distribution, the probability of becoming unemployed, and other risks are identical within the country.

Figure 2. Predominant Religions in Europe and Neighboring Regions



■ Roman Catholic Christianity ■ Protestant Christianity

## ***2.5 Hypothesis and Research Question***

In this paper I use what Guiso, Sapienza and Zingales (2006) call a “reduced form approach.” Often direct information about tastes, values and skills is not available in the data; therefore researchers need to link directly cultural differences to economic outcomes. Some examples of such research were already cited above (section 1.1.2).

Also in the current investigation I use data that provide a limited set of beliefs variables: trusting others, risk preferences, political preferences, optimism, sense of control, volunteering, and religiosity. If they do not capture all cultural aspects relevant to differences in financial behavior, then belonging to European linguistic communities might include the rest of such aspects. For example, because in the data that I have at my disposal, there are no direct questions about such cultural features as thrift, hard work, tenacity, honesty, tolerance etc., I hypothesize that they might be proxied by linguistic communities. Since, as will be shown below, financial instruments are highly complex assets, which demand certain skills and world views to be used, the decision to hold them might correlate with culture. In particular, these skills and opinions might not be at disposal of different ethnic, religious or social-class communities. Specifically, this paper hypothesizes that belonging to different linguistic communities in Europe might serve as a proxy for *the latent construct of having skills and values that triggers or deters holding of stocks and other risky financial assets*. I also hypothesize that if belonging to a linguistic community matters, it might explain some of the cross-country differences in all the three outcomes (*holding stocks, risky assets and risky assets plus IRA*). Therefore, my research question is: *Does belonging to a linguistic community in Europe matter in determining the three kinds of financial behavior of older adults?*

## ***3. Empirical Findings about Financial Instruments, Culture and Institutions***

Financial instruments are assets characterized by informational complexity, and many households may not own appropriate skills to manage them. Using a representative sample of the Dutch population, van Rooij, Lusardi and Alessie (2011) show that lack of



understanding of economics and finance is a significant deterrent to stock ownership. Those who have low financial knowledge are less likely to hold stocks. Therefore, *financial literacy* is an important determinant of stock market participation. This is also not a matter of general level of education, “those with high levels of schooling did not always score high on financial knowledge.” This suggests that schooling is not necessarily a good proxy for literacy.

In addition, Guiso, Haliassos and Jappelli (2003) maintain that the mutual funds are often complicated instruments that are not easy to understand even for well-educated investors. However, problems that are even more serious arise when the entry costs decrease. First, it leads to the entrance of less informed investors and second to increased delegation of portfolios’ management to the brokers. These two reasons (limited financial education of the new entrants and the delegation) may create the following imperfections. Since mutual funds managers usually also provide financial advice to investors, they might be inclined to manipulate the information in their own interest (i.e. provide untruthful information, abuse their role as financial advisors, and profit from their information advantage). For example, the managers might understate the riskiness of the instrument, hide the exit costs or information about better alternative financial instruments. Therefore, increased delegation may lead to bigger probability of fraud. Financially unsophisticated investors, who become afraid of being cheated by the brokers, are less likely to use mutual funds.

Thus, it is not surprising that research points out that *trust* is an important determinant of economic exchange, and financial transactions in particular. Guiso *et al.* (2004) found that the proportion of stockholders is higher in Italian provinces with relatively high *social trust*, other things being equal. Using Dutch micro data, they (Guiso *et al.*, 2005) also found that *individual* level of trust does affect stock market participation. Georgarakos and Pasini (2011), who studied trust, sociability, and stock market participation, point out that these two variables act via two distinct channels. Mistrust lowers the expected return from an investment, because investors who live in a low-trust region have to take into account the possibility that a contract will not be respected by the counterpart. It should be mentioned that Glaeser *et al.* (2000) found that trust, as

measured by the survey question, reflects *trustworthiness of the environment*, and therefore is a measure of social capital, rather than personal value variable.

In addition to the informational complexity and the need for appropriate skills to manage financial assets, the research pointed out to another explanation. Namely that as in every consumption taste matters, personal values affect consumption decisions (Vinson *et al.*, 1977). Value-expressive elements may also be present in investment behavior, consistent with the popularity of socially responsible investing (see Statman, 2000; Bollen, 2007; Hong and Kacperczyk, 2009). As a result, some people may exhibit a feeling of inconsistency between their personal values, and the values they perceive to be associated with the financial market. One can think of this mismatch as an additional participation cost. Some potential investors may thus stay out of the stock market because of their need to avoid this inconsistency (Kaustia and Torstila, 2011).

Besides, literature also shows that social interaction affects portfolio outcomes. Not only financial practitioners provide information about the financial instruments. Guiso, Haliassos and Jappelli (2003) state that there are informational spillovers from informed to uninformed investors in the same social circle. For example, Hong, Kubik and Stein (2004) show that households who visit their neighbors more often or take part in religious activities have a higher propensity to participate in financial market, and they attribute this finding to the possibility that social interactions lower information costs. The two channels through which social interaction might influence participation in financial market are **word-of-mouth** and **observational learning**. A similar argument is provided by Christelis, Jappelli and Padula (2010), who use variable called **social activities**.

Christelis, Georgarakos and Haliassos (2011) used engagement in **volunteering**, as an indicator of social interactions and of concern for others. As was mentioned above, Tabellini (2010) points out that respect for others, expressed in participation of individuals in the political and administrative life of their local communities, is an important predictor of economic development.

As was stated above, empirical studies have found crucial differences in financial behavior among older adults across European countries. Georgarakos and Pasini (2011) and Christelis, *et al.* (2013) used country dummies to capture the effects of country-

specific institutional environment that is likely to affect stockholding, such as the level of economic development, features of market or the legal environment. For example, Giannetti and Koskinen (2010) found that stock market participation is more widespread in countries with better investor protection. Additional differences across Western Europe were found with respect to such an important determinant of financial behavior as volunteering among people aged 50 or more years (e.g. Erlinghagen and Hank, 2006).

What if we compare **Linguistic Communities** rather than states? There are many parameters (relevant for the financial behavior of older adults), in which the linguistic communities across Europe are different or identical, and there are many determinants of these differences/similarities. As was already mentioned, the current paper (see chapter 2.2 and Appendix I) documents interesting variability between European linguistic communities with respect to some of such parameters.

#### *4. Other Variables Identified as Good Predictors of Stocks- or Bonds-holding*

Traditional theory predicts that investor's willingness to participate in financial market depends on risk aversion (Christelis *et al.*, 2010). Also Guiso and Paiella (2004) find that risk aversion is an important factor in explaining investing behavior. As was already mentioned above, another subjective preference that was identified by recent research as an important determinant of low participation in stock-markets is left-wing political orientation (Kaustia and Torstila, 2011).

The positive effect of education on financial behavior is already well documented (Fratantoni, 1998; Haliassos and Bertaut, 1995; Rosen and Wu, 2004; Yamishita, 2003). Christelis, Georgarakos and Haliassos (2011) explain that the level of education tends to influence not only future employment and earnings prospects but also the ability of the household to collect and process information relevant for asset and debt market participation.

These authors also explain that controlling for resources is dictated both by modern portfolio theory, with its emphasis on “cash on hand” (the sum of wealth and labor income) as an important determinant of portfolio formation, and by the need to avoid confounding role of other determinants with that of wealth when the latter is not adequately accounted for. Moreover, further relevance of income and wealth in the participation decision should be related to the fact that the financial services sector offers better terms to large investors than to smaller ones (Guiso *et al.*, 2003). Therefore, Christelis, Georgarakos and Haliassos (2011) control for income and net wealth quartiles (where wealth excludes the asset in question), in order to capture the relevance of household economic resources for asset demand. Income (in logs) and dummies for quartiles of wealth were used also by van Rooij, Lusardi and Alessie (2011); Guiso, Haliassos and Jappelli (2002) and Campbell (2006). Also Georgarakos and Pasini (2011) control for an independent role of resources including separate controls for net total wealth and income. Finally, Kaustia, and Torstila (2011) controlled for house ownership as an additional proxy for wealth.

The positive effect of good health on stock-market participation is also already well studied (Fratantoni, 1998; Rosen and Wu, 2004; Christelis *et al.*, 2010). According to Rosen and Wu (2004) households with health problems are discouraged from investing in stocks. Christelis, Georgarakos and Haliassos (2011) claim that physical health can influence not only the ability and inclination of the household to make the effort required for investing in asset markets, but also the amount of background risk the household faces due to out-of-pocket health expenditures (for a detailed discussion about the effects of health on financial behavior among the older adults see Christelis *et al.*, 2010). As a measure of health they used the number of activities of daily living (ADLs) with which the household has problems (see also Georgarakos and Pasini, 2011). Finally, Georgarakos and Pasini (2011) accounted for the state of mental health (depression) as a measure of pessimism.

Christelis, Jappelli and Padula (2010) found a significant role of cognitive abilities on stockholding. In particular, they considered such indicators as numeracy (or mathematical ability), verbal fluency, and recall skills. These abilities affect how people make financial decisions and manage their portfolios.

Christelis, Georgarakos and Haliassos (2011), who studied differences in portfolios across countries, controlled for household size, which is likely to determine consumption needs and affect the amount available for saving out of a given amount of resources. They also controlled for marital status, which can determine spending decisions, the responsibilities of the household member in charge of finances, and potential constraints on that member's behavior in asset and debt markets. Georgarakos and Pasini (2011) also accounted for the number of children.

Studies of financial behavior included in their analyses also the demographic variables: age and gender (Georgarakos and Pasini, 2011; Haliassos and Bertaut, 1995; Guiso *et al.*, 2002; Campbell, 2006). van Rooij, Lusardi and Alessie (2011) found that stock market participation increases with age; stock ownership is concentrated among those 40 and older. Hurd (1990) found that the large proportion of stock ownership for those older than 70 may be the result of differential mortality between richer and poorer households. As to gender, stock market participation is much lower among women than men (Haliassos and Bertaut, 1995). This was found by Lusardi and Mitchell (2007) to be consistent with the immense differences in literacy between women and men. Finally, as was already demonstrated above, it is very important to control for country dummies in order to capture country-specific institutional environment that in some cases promotes, while in other deters access to the financial assets.

## *5. Data and Variables*

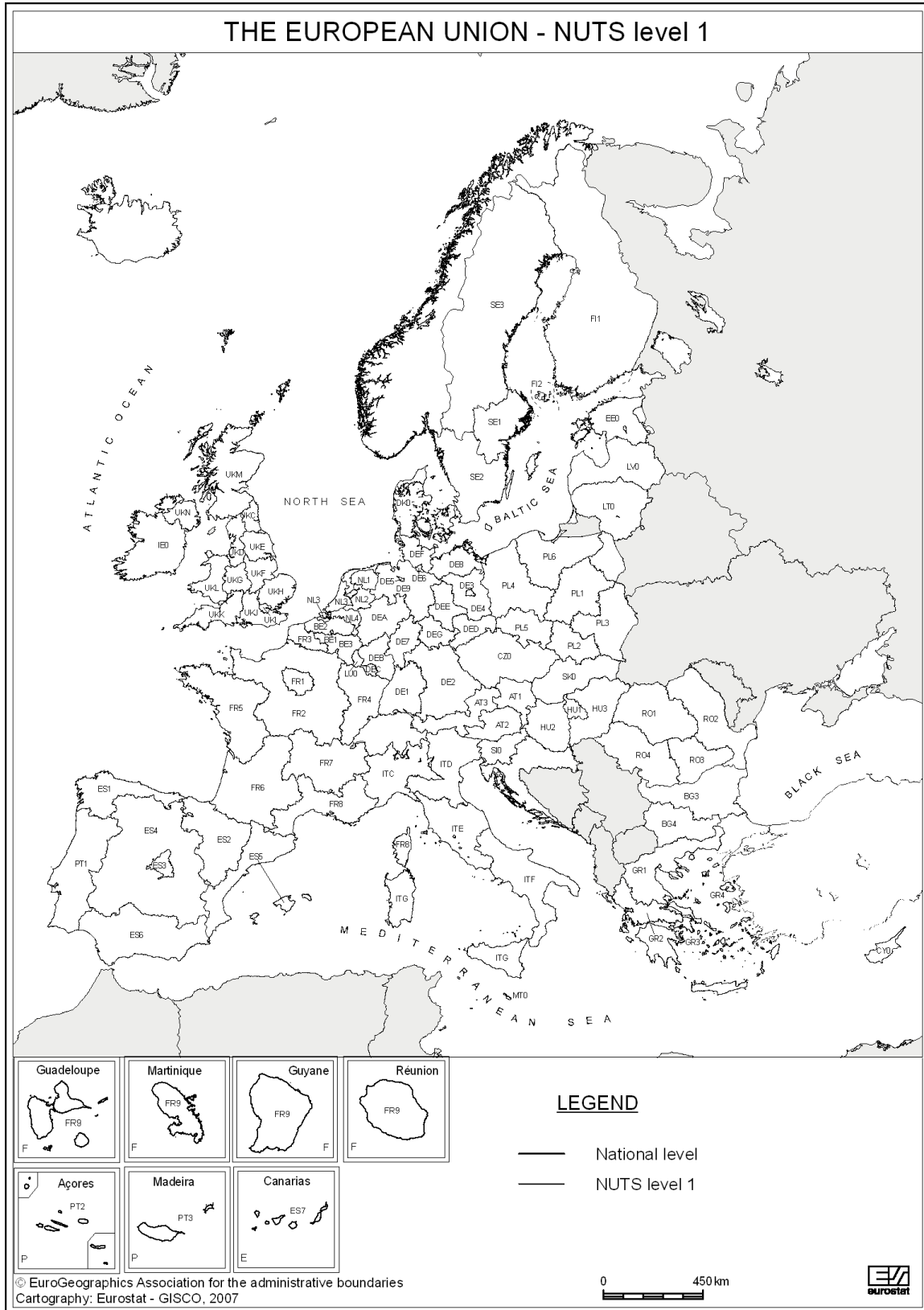
For empirical analysis I use the Survey of Health, Ageing and Retirement in Europe (SHARE). SHARE is a multi-disciplinary, cross-national panel survey that is representative of the population aged 50 and over in a number of European countries. The survey provides micro data on health, socio-economic status and social and family networks (Börsch-Supan, *et al.*, 2008). In particular, it contains detailed information on both financial and real assets and a wide range of household background characteristics, including the language of interview. Financial assets include bank and other transaction accounts, government and corporate bonds, stocks, mutual funds, individual retirement accounts, contractual savings for housing, and life insurance policies (Christelis *et al.*,

2010). The current analysis is done, using wave 4 of the survey (2010/11). However, if an answer was asked only to a new respondent, I copied values for the longitudinal respondents also from Wave 1 or Wave 2, using method, developed in Gruber, Hunkler and Stuck (2013).

In SHARE, analogous to other similar surveys, one respondent of an eligible couple is designated as a “financial respondent.” This person provides information about the household finance. Therefore my sample is at the household level, rather than at individual level, i.e. includes only the household representative, who answered the questions about finance.

To perform analysis, I chose only such countries, where there exists a linguistic group, which speaks a language also spoken in another country. There are 10 linguistic communities: German-speakers, living in Germany (de), German-speakers, living in Austria (at) and ones, living in Switzerland (ch); Italian-speakers in Italy (it) and Italian in Switzerland (ch); French in France (fr), French in Belgium (be) and French in Switzerland (ch); and finally Dutch in the Netherlands (nl) and Flemish in Belgium (be). Moreover, I have chosen only close regions by using the 1st level of the *Nomenclature of Territorial Units for Statistics Classification* (NUTS1), which is a hierarchical system for dividing up the economic territory of the EU (see Figure 3 below). Namely, I chose South Germany (specifically, DE1 Baden-Wuerttemberg and DE2 Bayern), Northern Italy (ITC Nord-Ovest, ITD - Nord-Est) and Eastern France plus Paris (FR1 Ile de France, FR3 Nord - Pas-de-Calais, FR7 Centre-Est, FR8 Mediterranee). After choosing the appropriate regions, I am left with 14,243 households of people 50 years old and older. See Table 2 below, which describes the composition of the sample by the Linguistic Communities.

Figure 3. Nomenclature of Territorial Units for Statistics Classification (NUTS1)



## ***5.1 Dependent Variables***

I consider three dependent variables, which are different kinds of household financial behavior. The first kind is pure stock-holding (direct and indirect), which is defined as a dummy, taking value of 1, if respondents answered that they own stocks and/or mutual funds and/or individual retirement accounts (IRA), two last mostly in stocks. The second kind is holding of stocks and/or bonds (Risky Assets), which is defined as a dummy, taking value of 1 if they reported that they own at least one of the following: bonds, stocks, mutual funds. Finally, I consider also holding risky assets plus IRA. In other words, the last outcome variable is defined as a dummy, taking value of 1 if they reported that they own at least one of the following: bonds, stocks, mutual funds, IRA.

## ***5.2 Independent Variables***

Main Predictors. As follows from above discussion, the main variable of interest in the current investigation is belonging to one of the linguistic groups, which enters the equations in form of dummy variables. Table 2 describes these variables and provides Abbreviated Variable Names that were used in the analyses.

Table 2. The Sample by Linguistic Community

<b>Linguistic Community</b>	<b>Abbreviated Variable Name</b>	<b>Wave 4</b>
German (at)	l_DE_at	3,756
German_S (de)	l_DE_de	233
German (ch)	l_DE_ch	1,869
Italian_N (it)	l_IT_it	497
Italian (ch)	l_IT_ch	99
French_E (fr)	l_FR_fr	1,489
French (ch)	l_FR_ch	666
French (be)	l_FR_be	1,908
Dutch (nl)	l_Du_nl	1,891
Flemish (be)	l_FL_be	1,835
Total		14,243



In addition, I also control for Subjective Preferences, defined as risk aversion and political preferences. The former preference is represented by three dummies derived from the question, which was asked in wave 4 only for new participants. For longitudinal respondents I copied values from SHARE wave 2. The question was worded as follows: “When people invest their savings they can choose between assets that give low return with little risk to lose money, for instance a bank account or a safe bond, or assets with a high return but also a higher risk of losing, for instance stocks and shares. Which of the statements comes closest to the amount of financial risk that you are willing to take when you save or make investments? 1. Take substantial financial risks expecting to earn substantial returns 2. Take above average financial risks expecting to earn above average returns 3. Take average financial risks expecting to earn average returns 4. Not willing to take any financial risks.” I derived 3 dummies, low risk aversion =1 if a respondent chose answers 1 or 2, zero otherwise; average risk aversion =1 if a respondent chose answer 3, zero otherwise; and high risk aversion =1 if a respondent chose answer 4. The latter preference is a continuous variable (called *rightist*, Kaustia and Torstila, 2011) and was derived from the question “In politics people sometimes talk of “left” and “right”. On a scale from 0 to 10, where 0 means the left and 10 means the right, where would you place yourself?” Again, for the longitudinal respondents I used values from SHARE wave 2.

I also have a block of Objective Characteristics, which includes *human capital*, *health* and *demographic variables*. First human capital variable is numeracy. SHARE respondents are asked to perform the following simple calculations: (1) find 10 percent of a number; (2) find one half of a number; (3) find the number of which another known number represents two-thirds; (4) find 10 percent of another number at the end of 2 years. On the basis of these four questions Dewey and Prince (2005) construct a numeracy indicator, which ranges from one to five. The next variable of human capital sub-block is education. In SHARE the individual’s highest educational degree appears in the form of the 1997 International Standard Classification of Education (ISCED). I created a dummy equal 1 if ISCED is at least some post-secondary education (value=4); values of ISCED that are below 4 correspond to zero in the education dummy. Next, I include variables, related to the resources. SHARE provides detailed information on real assets. The questions on real assets refer to the value of the house of residence, other real estate,

business wealth and vehicles (see Christelis *et al.*, 2005 for details). In my analyses this variable is represented in the form of quintiles of real assets. In addition, I control for household income, which is calculated as total household income from all sources net of capital income, adjusted for purchase power parity (ppp). I transform this variable, as suggested by literature, using the inverse hyperbolic sine (IHS) transformation. IHS is defined as  $\ln(t + \sqrt{t^2 + 1})$ , and is approximately equal to  $\ln(2t)$  for positive values of  $t$ . It is linear around zero (See Burbidge *et al.*, 1988). Finally, I control for home ownership using a dummy derived from a variable provided by SHARE in the form of estimated values of the respondents' main residence. I also consider health as a human capital variable, accounting for limitations in activities of daily living. I construct a dummy =1 if a respondent has 1 to 6 limitations, zero if s/he reports 0 limitations;

Social capital is measured by the household's size, which is a number of all persons in the household. In addition, I include presence of a partner/spouse in the household; this variable is dummy for partner inside the household =1 if respondents and their partners live together/ married. I also account for the number of children. Finally, I control for standard demographic variables, age (from 50 to 104) and gender (where the binary indicator equals 1, if the respondent is female).

The last block of variables captures some cultural characteristics. Trusting other people was derived from the standard survey question: "generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? Please tell me on a scale from 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted." Sense of control is a dummy (=1 if respondents answer "Rarely/Never feel that what happens is out of their control," 0 otherwise). Optimism is measured by two variables: life is full of opportunities (=1, if respondents answer "Often/Sometimes feel that life is full of opportunities," 0 otherwise) and future looks good (=1 if respondents answer "Often/Sometimes feels that the future looks good," 0 otherwise). I also included an indicator of volunteering or participating in political or community-related organization. SHARE Wave 4 provides information about various kinds of social activities that individuals have performed in the year prior to the interview. I counted (1) done voluntary or charity work and/or (2) taking part in a political or community-related organization (the dummy volunteering). I also used a

separate dummy, religious organization (= 1 if respondents attended a religious organization in the year prior to the interview). For the respondents, who had missing values for these two variables (i.e. volunteer activities and religious organization) I copied answers from Wave 1 or Wave 2, if these values were non-missing. It should be mentioned that in contrast to Wave 4, in two previous waves the question about activities was asked for a different period, namely in the *month* prior to the interview (distributions of answers for one year and one month are identical). Finally I introduced a variable capturing religiosity or intensity of trust in God, derived from the question “How often you pray?” I recoded the original variable into three categories: 1. Never; 2. Sometimes; 3. Often.

## ***6. Results***

### ***6.1 Descriptive Statistics***

Summary statistics and description of all variables used in the empirical analysis are presented in Table 3. With respect to the financial behavior, it shows that in the sample 18% of the households hold stocks either directly or indirectly (in mutual funds or IRA). Next, 27% report that they hold risky assets; and finally 39% hold risky assets plus IRA. The table also shows that 70% of the sample is highly risk averse. Most of the sample (above 80%) is optimistic and two-thirds (67%) report that they feel control over things that happen to them. The participation in the voluntary activities is quite high: 28%, this is apparently so due to inclusion of the whole Swiss and Dutch samples (the countries that are characterized by higher levels of volunteering). Attending of religious organizations was reported by 15% of the households. Almost one-third of the sample has post-secondary education. With respect to the wealth, on average the households are found in the middle, i.e. belong to the 3<sup>rd</sup> quintile. The two-thirds of the households (65%) own a home. Regarding health, the vast majority of the sample (89%) is healthy, i.e. doesn't have any ADL limitation. The sample contains a bit more female financial respondents (54%) than males. Almost two-thirds (60%) of the households consists of two partners. Average age is 66 years old. On average household size is 2 persons and the same is their number of the children.

Table 3. Descriptive Statistics

<b>Variable</b>	<b>Description</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Pure stock-holding	Dummy for having stocks directly, or indirectly (in mutual funds or IRA)	13749	0.180	0.384	0	1
Holding of risky assets	Dummy for having bonds, stocks or mutual funds	13875	0.271	0.445	0	1
Holding risky assets plus IRA	Like the above + IRA	13871	0.388	0.487	0	1
Low risk aversion	=1 if a respondent chose answers 1 or 2, zero otherwise;	13405	0.046	0.209	0	1
Average risk aversion	=1 if a respondent chose answer 3, zero otherwise;	13405	0.252	0.434	0	1
High risk aversion	=1 if a respondent chose answer 4.	13405	0.702	0.457	0	1
Trusting other people	Trusting Scale: 0 – 10 (most people can be trusted)	13565	5.733	2.389	0	10
Control	Rarely/Never feels that what happens is out of his/her control	14023	0.671	0.470	0	1
Life is full of opportunities	Often/Sometimes feels that life is full of opportunities	13982	0.839	0.368	0	1
Future looks good	Often/Sometimes feels that the future looks good	13962	0.817	0.387	0	1
Volunteering	Volunteering or participating in political or community-related organization: Last Year or Last Month	13955	0.286	0.452	0	1
Religious organization	Attended a Religious Org Last Year or Last Month	13957	0.154	0.361	0	1
Trust in god	How often you pray: 1. Never; 2. Sometimes; 3. Often	12843	1.903	0.804	1	3
Rightist	Scale: 0 (Left) – 10 (Right)	11797	5.082	2.080	0	10
Numeracy	The higher the better	14243	3.659	1.038	1	5
Post-Secondary	ISCED $\geq$ 4	14008	0.296	0.457	0	1

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
Education						
Quintiles of real assets	Derived from a ppp-adjusted rough variable	14243	3.159	1.562	1	5
Home-ownership	Imputations: dummy derived from homev	14243	0.646	0.478	0	1
IHS of ppp-adjusted household income	Inverse hyperbolic sine of hh income, ppp-adjusted	14243	10.885	1.215	0	14.9
Health (ADL limitations)	Dummy, =1 if a respondent has 1 to 6 limitations, zero if s/he reports 0 limitations;	14194	0.113	0.317	0	1
Female	Gender	14243	0.543	0.498	0	1
Partner in household	=1 if there is a partner inside the household	14243	0.596	0.491	0	1
Age		14243	66.189	10.502	50	104
Household size		14243	1.940	0.959	1	10
Number of children		14180	2.085	1.452	0	14

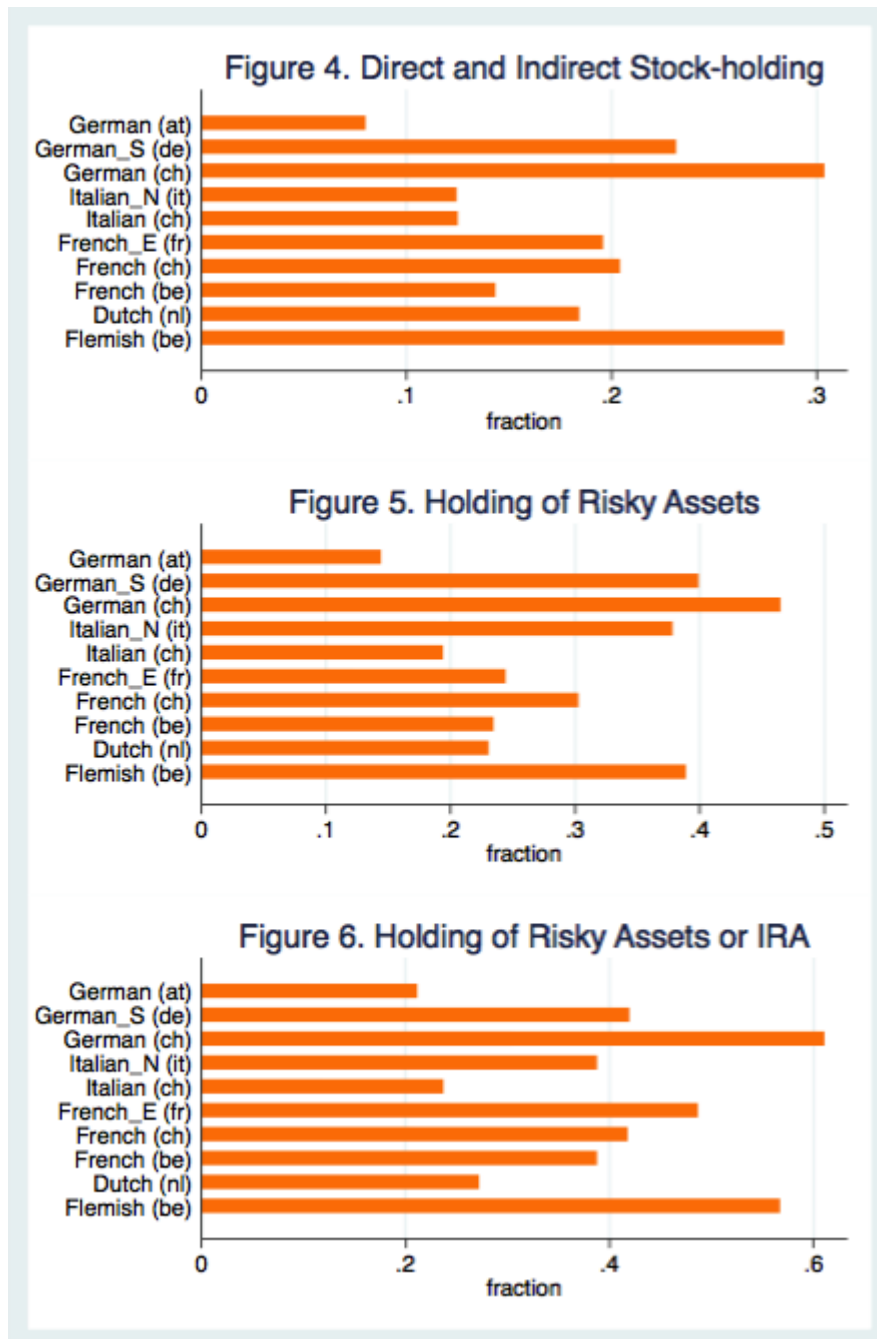
## ***6.2 Distribution of the Dependent and Selected Independent Variables by the Linguistic Communities***

### **6. 2.1 Dependent Variables**

Graphical evidence in Table 4 represents ownership rates of all the three kinds of financial assets by linguistic community. It is evident that there are quite a few thought-provoking patterns across the chosen groups. For example, the German-speakers behave differently in the 3 countries (this pattern repeats itself for all the figures). The same pattern of financial behavior characterizes also Flemish and Dutch communities across all the outcomes; among the Flemish the fraction of assets holding is always much higher than among the Dutch. For other communities the patterns are changing. With respect to directly and indirectly held stocks Italian-speakers behave identically in Italy and Switzerland (Figure 4). Italians in Italy own much more of risky assets (stocks, bonds and/or mutual funds) than Italian speakers in Switzerland (Figure 5). This finding is in line with the tradition of purchasing government bonds as a type of investing money in

Italy. The same is true about Italian speakers with respect to the risky assets plus individual retirement accounts (Figure 6). Finally, French in France and Switzerland behave identically with respect to stock-holding; while in Belgium the fraction of French-speaking stock-holders is lower (Figure 4). With respect to the risky assets, French in Switzerland have a higher fraction than French-speakers in the two other countries (Figure 5). Considering the last outcome, i.e. holding risky assets plus IRA, French-speakers in France have a higher fraction of holders than in the two other countries (Figure 6).

Table 4. Outcomes: Proportion of hhd's by Linguistic Community



### 6.2.2. Selected Preferences and Social or Cultural Characteristics (See figures in the Appendix I)

There is no much variability among the Linguistic Communities with respect to risk aversion (Figure 7, Appendix I). The most risk averse community is Italian-speakers in Switzerland, while French-speakers in this country are the least risk averse community. Other communities lie in between. There is no much similarity among linguistic groups, except for French-speakers in France and Belgium, as well as Dutch and Flemish. Regarding volunteering (Figure 8), the Dutch community has the highest rate of volunteering, followed by the Swiss communities. German-speakers in Germany volunteer less, while other communities have even lower rates, especially the Italian-speakers in Italy. Attendance of religious organization is characterized by significant heterogeneity among the communities (Figure 9). Except for Italian-speakers in both countries, all other linguistic communities behave differently. The most active participants are German-speakers in Austria, followed by German-speakers in Switzerland and the Dutch. The lowest fraction of participants is found in France, while other communities lie in between. Also the respondents' feeling of control over what happens in their life is characterized by significant heterogeneity among the communities (Figure 10). Again, Italian-speakers in both countries behave identically. The same now applies to the French-speakers in France and Switzerland, as well as to the Dutch and Flemish communities. The highest fraction of those, feeling control is found among German-speaking Swiss, followed by Austrians. The lowest fraction is found among French-speaking Belgians. Other communities lie in between. Figures 11 and 12 report distribution of the measures of optimism. There is no much variability with respect to the distribution of respondents' feeling that life is full of opportunities (Figure 11). The highest fractions of respondents optimistic in terms of this variable are found among Swiss linguistic communities, as well as the Dutch. The lowest fraction is found among Italian-speakers in Italy. Other communities lie in between. Regarding the respondents' feeling that future looks good (Figure 12), again, the highest rates of optimism are found among Swiss linguistic communities (with the highest fraction among German-speakers), as well as the Dutch, but now also among Austrians. French-speakers in Belgium show less optimism. Other communities lie in between. Finally, I report findings about trust in



God by linguistic community (Figure 13). I assume that the respondents, who answered that they never pray, are secular. The most secular community is French-speakers in France (however this finding should be treated with caution, because it was asked only to the new respondents in Wave 4). The German-speakers are identical in terms of secularity, but also very similar in terms of the composition with moderate and strong believers. Switzerland and Belgium show that there is similarity with respect to religiosity among the linguistic communities in these countries. Finally, the linguistic community that behaves identically in terms of secularity, despite living in different countries, is the Dutch and Flemish.

### ***6.3. Empirical Strategy***

To test the hypothesis that belonging to different linguistic communities in Europe matters for financial behavior of older adults I use the Linear Probability Model (LPM). I ran 4 OLS regressions, where each OLS adds more controls to the 1<sup>st</sup> - baseline – model. I regress three kinds of household financial behavior (see Table 5) on these 4 models (see Table 6).

Table 5. Outcomes: 3 kinds of financial behavior

1 <sup>st</sup> Outcome	Pure <b>Stocks-Holding</b> (direct and indirect)
2 <sup>nd</sup> Outcome	Risky Assets (holding stocks <b>and/or BONDS</b> )
3 <sup>rd</sup> Outcome	Risky Assets + <b>IRA</b>

First, the base-line model explains differences in the outcome only by belonging to a linguistic community. Then, in the second model in addition to the language dummies, I also include objective socio-economic characteristics, such as quintiles of real assets, inverse hyperbolic sine of ppp-adjusted household disposable income, home-ownership, education, health (ADL limitations) and a measure of cognitive abilities (numeracy). The second model also includes demographic variables (gender and age), as well as social capital variables, having a partner in the household, household size and number of children. In the third model I added to the above variables also respondents' subjective preferences, as suggested by literature on financial market participation (risk aversion and

political orientation). Finally, in the 4<sup>th</sup> model social/cultural characteristics were added as explanatory variables. These included the measure of trusting other people, participating in volunteer activities, optimism (life is full of opportunities and future looks good), attendance of a religious organization, and finally a measure of trusting in god (as captured by the frequency of prayer).

Table 6. Description of the 4 Models

Model 1	Only Country/Language Interactions Dummies
Model 2	Country/Language Interactions Dummies + Objective Characteristics
Model 3	Country/Language Interactions Dummies + Objective Characteristics + Subjective preferences
Model 4	Country/Language Interactions Dummies + Objective Characteristics + Subjective preferences + Social/Cultural Characteristics

Table 7 provides illustration of the LPM strategy. In every regression table (Table 8, Table 10 and Table 12), each of the 4 models (described above) contains 2 columns. The first column refers to a LPM with country dummies, whereas the second refers to the linguistic communities (interaction terms of country and language). The entire regression tables are placed the Appendix II. In the section 5.4 below, I present only the main findings, i.e. the coefficients for country dummies and for linguistic communities, without showing the controls. In addition, below each regression table, I also present graphical illustration, which compares the regression coefficients for country dummies with the country-language interaction terms.

Table 7. Description of the LPM Procedure

	<b>Model 1</b>		<b>Model 2</b>		<b>Model 3</b>		<b>Model 4</b>	
	(1) Country Dummies	(2) Ling. Com.	(3) Country Dummies	(4) Ling. Com.	(5) Country Dummies	(6) Ling. Com.	(7) Country Dummies	(8) Ling. Com.
Only Country or Linguistic Dummies	V	V	V	V	V	V	V	V
+ Objective Characteristics			V	V	V	V	V	V
+ Subjective preferences					V	V	V	V
+ Social/Cultural Variables							V	V

The main variable of interest in the current investigation is belonging to one of the linguistic groups. Hence, after running 4 OLS models for each of 3 kinds of financial behavior I performed F-Test for joint equality of the same linguistic group across countries, as well as for the joint equality of different linguistic groups within countries, where different linguistic groups coexist, i.e. Switzerland and Belgium. Next, to address the issue of clustering the standard errors by the linguistic communities, as suggested by Cameron and Miller (2015), I performed an additional analysis in the Appendix III (for more details see section *Discussion*). Finally, as a robustness check I performed the same analysis, using the probit model (see Appendix IV), which confirmed my findings, using the LPM.

## 6.4. Multivariate Analysis

### 1 Outcome: Pure Stocks-Holding (direct and indirect)

Table 8 shows that – even after accounting for a wide set of controls – belonging to different linguistic communities matters in determining **stock-market participation**. To present these results I created graphical evidence below this table, and used F-test analyses to formally confirm the results (Table 15 and Table 16). Italian-speakers in

Northern Italy are significantly less likely to hold this type of financial assets than the reference group (Germans in the South Germany); however the significance and magnitude of the coefficient decrease after addition of the **objective characteristics**. Swiss Italian-speakers, as well, are less likely to hold this type of financial assets than the reference group, but significance of the coefficient disappears after addition of the **objective characteristics** and the magnitude is decreasing. Table 15 (Post-Estimation Results of the F-Test) shows that when we consider the pure stock-holding, it is evident that already in the 1<sup>st</sup> model we fail to reject the hypothesis that Italian-speakers in the North of Italy behave identically to the Italian-speakers in Switzerland.

If we look at German-speakers, while Austrians always are significantly less likely to hold this type of financial assets than the reference group (Germans in the South Germany), Swiss German-speakers are more likely to hold them than the reference group until the **subjective preferences** are included (in the 3<sup>rd</sup> model), when their stock-holding becomes indistinguishable from that in South Germany. Post-Estimation Results of the F-Test (Table 15) confirm that no variables-block in my models is able to explain the fact that the identity in stock-holding among German-speakers must be rejected, as well as the identity of this behavior between Dutch and Flemish-speakers. Dutch and Flemish-speakers are always indistinguishable from the reference group; however the coefficient for the Dutch dummy is always negative, while for the Flemish it is positive.

French-speakers represent a more interesting case. While the behavior of French-speakers in France and in Switzerland is not distinguishable from the reference group (German-speakers in South Germany), French-speakers in Belgium alone are significantly less likely to have stocks, however the 4<sup>th</sup> model diminishes the explanatory power of this group, which contributes to closing the gap in behavioral differences between Francophone populations in different countries. Post-Estimation Results (Table 15) show the change in p-values of the F-Test for rejection of the hypothesis that the stock-holding behavior of French-speakers is identical. The test becomes less significant with introducing each new block of regressors, and in the last model – **after adding the cultural characteristics** – we cannot anymore reject the identity of the behavior at 95% level. This finding should be attributed to the decrease in explanatory power of the dummy for French-speakers in Belgium.

In addition (see Table 8 in Appendix II), with respect to subjective preferences and social/cultural variables, being less risk-averse and having more right-wing political orientation (perhaps not surprisingly) increase stock-market participation. Finally, cultural traits, such as volunteering and, especially, trusting other people are positively correlated with the stock-market participation.

Table 8: LPM. OLS. Pure Stocks-Holding (direct and indirect), 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Country/ Linguistic Communities Dummies								
AT	-0.151*** [0.029]		-0.105*** [0.027]		-0.113*** [0.030]		-0.120*** [0.030]	
CH	0.04 [0.030]		0.032 [0.028]		0.021 [0.031]		0.014 [0.031]	
IT_N	-0.107** [0.033]		-0.071* [0.030]		-0.084* [0.034]		-0.076* [0.034]	
NL	-0.047 [0.030]		-0.028 [0.028]		-0.037 [0.031]		-0.045 [0.031]	
FR_E	-0.036 [0.031]		-0.014 [0.028]		-0.007 [0.038]		-0.005 [0.039]	
BE	-0.02 [0.030]		-0.008 [0.027]		-0.014 [0.031]		-0.012 [0.031]	
l_DE_at		-0.151*** [0.029]		-0.107*** [0.027]		-0.115*** [0.030]		-0.120*** [0.030]
l_DE_ch		0.072* [0.031]		0.062* [0.028]		0.052 [0.032]		0.048 [0.032]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
l_IT_it		-0.107** [0.033]		-0.071* [0.030]		-0.085* [0.034]		-0.078* [0.034]
l_IT_ch		-0.106* [0.044]		-0.083 [0.046]		-0.058 [0.049]		-0.063 [0.049]
l_FR_fr		-0.036 [0.031]		-0.014 [0.028]		-0.009 [0.038]		-0.007 [0.039]
l_FR_ch		-0.027 [0.033]		-0.028 [0.031]		-0.053 [0.034]		-0.057 [0.034]
l_FR_be		-0.088** [0.030]		-0.060* [0.028]		-0.067* [0.031]		-0.063* [0.031]
l_Du_nl		-0.047 [0.030]		-0.026 [0.028]		-0.036 [0.031]		-0.042 [0.031]
l_FL_be		0.052 [0.031]		0.047 [0.028]		0.042 [0.032]		0.041 [0.032]
_cons	0.231*** [0.029]	0.231*** [0.029]	-0.204*** [0.047]	-0.152** [0.046]	-0.270*** [0.052]	-0.215*** [0.052]	-0.319*** [0.054]	-0.256*** [0.054]
Controls			V	V	V	V	V	V
N	13749	13749	13516	13516	11178	11178	10842	10842
r2	0.032	0.044	0.13	0.137	0.18	0.188	0.182	0.189

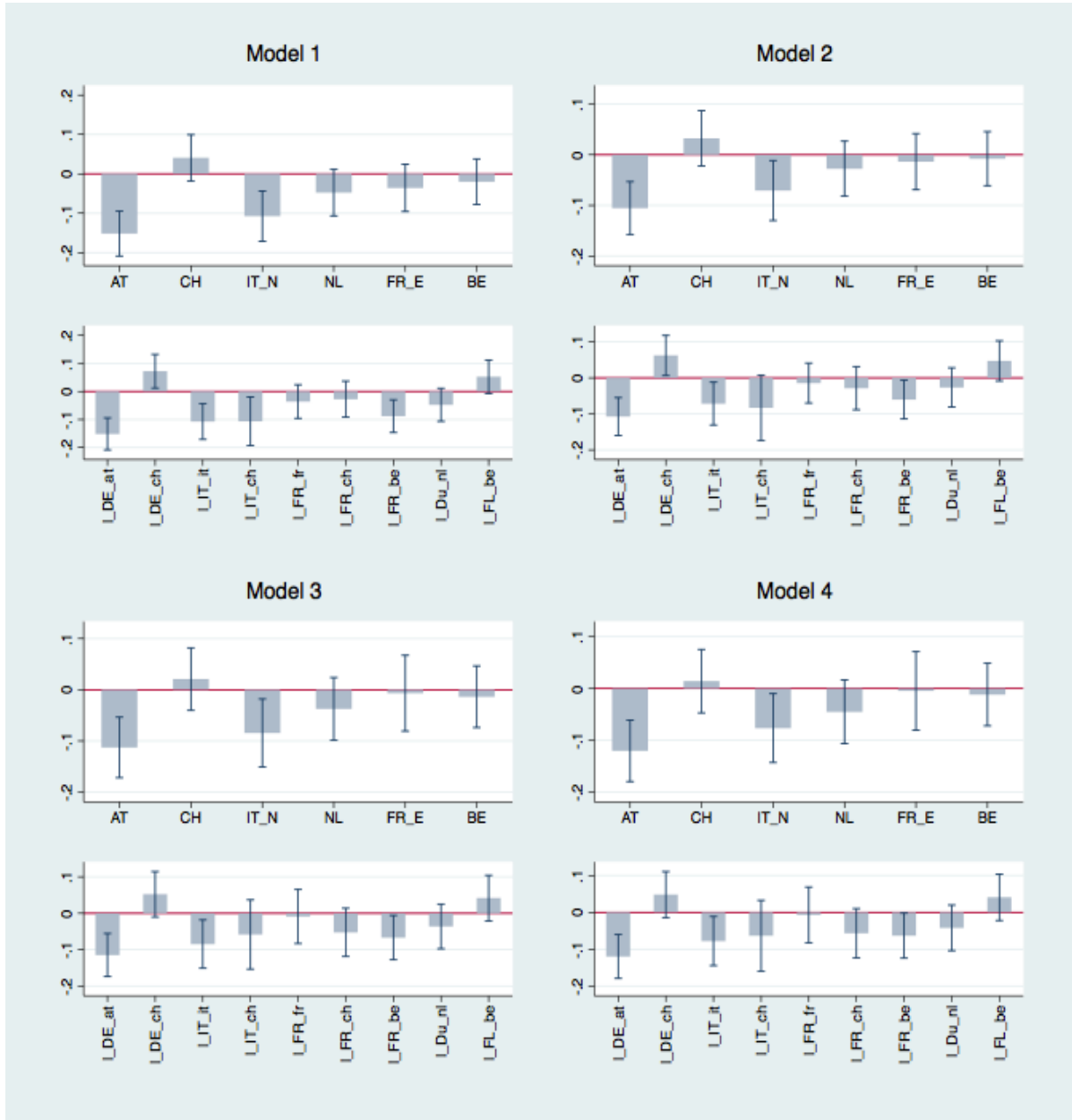
Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

In addition to the regression tables I also present graphical illustration (Table 9), comparing the regression coefficients (from the Table 8). Each panel in the table corresponds to one of the 4 Models; it compares country dummies (the upper plot) with the country-language interaction terms (the lower plot) as deviations from South Germany and German-speakers in South Germany (respectively). Table 9 demonstrates

the influence of each of 4 variables-blocks (Models) on country and linguistic communities' dummies.

Table 9: Graphical illustration for influence of the 4 Models on country (the upper plot in each panel) and linguistic communities' dummies (the lower plot in each panel), as deviations from South Germany and German-speakers in South Germany (respectively)



## 2 Outcome: Risky Assets (holding stocks and/or bonds and/or mutual funds)

Table 10 shows that – even after accounting for a wide set of controls – belonging to different linguistic communities (especially to the Francophone community) matters in determining holding of Risky Assets. Italian-speakers in Northern Italy are indistinguishable from the reference group and are unaffected by addition of explanatory variables, while Swiss Italian-speakers are significantly less likely to hold this type of assets than the reference group, but this significance decreases a little after addition of the **objective characteristics**. As to the German-speakers, different models also do not change much the coefficients of the linguistic groups; Austrians are significantly less likely to hold risky assets than the reference group, while Swiss German-speakers are indistinguishable from the reference group. Finally, Dutch are unaffected by addition of explanatory variables and are significantly less likely to hold this type of assets than the reference group, while Flemish are indistinguishable and unaffected. Post-Estimation Results of the F-Test (Table 15) confirm that no variables-blocks in my models are able to explain the fact that the identity in this financial behavior must be rejected among Italian-speakers in the North of Italy and the Italian-speakers in Switzerland, as well as among German-speakers and Dutch and Flemish-speakers.

Again, Francophone populations represent a special case. All the three French-speaking groups are significantly less likely to hold risky assets than the reference group. Adding blocks of variables does not seem significantly alter explanatory power of the 2 groups, but only of the Swiss French-speakers, and adding the **subjective preferences** increase its significance to 99.9% level. Post-Estimation Results of the F-Test (Table 15) show that the identity of their financial behavior cannot be rejected already after introducing the **objective characteristics**.

In addition (see Table 10 in Appendix II), again, being less risk-averse increases stocks- and bonds-holding, however political orientation plays no role in determining this kind of behavior. Finally, cultural traits, such as trusting other people, future looks good and especially volunteering are positively correlated with the stocks- and bonds-holding.



Table 10: OLS. Risky Assets (holding of stocks and bonds and/or mutual funds), 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Country/ Linguistic Communities Dummies								
AT	-0.255*** [0.033]		-0.197*** [0.031]		-0.213*** [0.033]		-0.220*** [0.033]	
CH	0.014 [0.034]		0.001 [0.032]		-0.025 [0.034]		-0.035 [0.034]	
IT_N	-0.021 [0.040]		0.024 [0.037]		0.01 [0.040]		0.024 [0.040]	
NL	-0.168*** [0.034]		-0.148*** [0.031]		-0.167*** [0.034]		-0.180*** [0.034]	
FR_E	-0.155*** [0.035]		-0.129*** [0.032]		-0.162*** [0.040]		-0.168*** [0.041]	
BE	-0.090** [0.034]		-0.077* [0.031]		-0.092** [0.033]		-0.094** [0.034]	
l_DE_at		-0.255*** [0.033]		-0.199*** [0.031]		-0.215*** [0.033]		-0.219*** [0.033]
l_DE_ch		0.066 [0.035]		0.048 [0.032]		0.021 [0.034]		0.013 [0.035]
l_IT_it		-0.021 [0.040]		0.023 [0.037]		0.009 [0.040]		0.022 [0.040]
l_IT_ch		-0.205*** [0.052]		-0.171** [0.054]		-0.144* [0.057]		-0.163** [0.057]
l_FR_fr		-0.155***		-0.130***		-0.165***		-0.172***

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
		[0.035]		[0.032]		[0.040]		[0.041]
l_FR_ch		-0.097** [0.037]		-0.102** [0.035]		-0.137*** [0.037]		-0.142*** [0.037]
l_FR_be		-0.165*** [0.034]		-0.130*** [0.032]		-0.141*** [0.034]		-0.140*** [0.034]
l_Du_nl		-0.168*** [0.034]		-0.147*** [0.032]		-0.165*** [0.034]		-0.177*** [0.034]
l_FL_be		-0.01 [0.035]		-0.024 [0.032]		-0.043 [0.034]		-0.049 [0.035]
_cons	0.399*** [0.033]	0.399*** [0.033]	-0.344*** [0.053]	-0.284*** [0.053]	-0.387*** [0.058]	-0.329*** [0.058]	-0.447*** [0.060]	-0.381*** [0.060]
Controls			V	V	V	V	V	V
N	13875	13875	13637	13637	11259	11259	10914	10914
r2	0.047	0.062	0.172	0.181	0.229	0.237	0.234	0.242

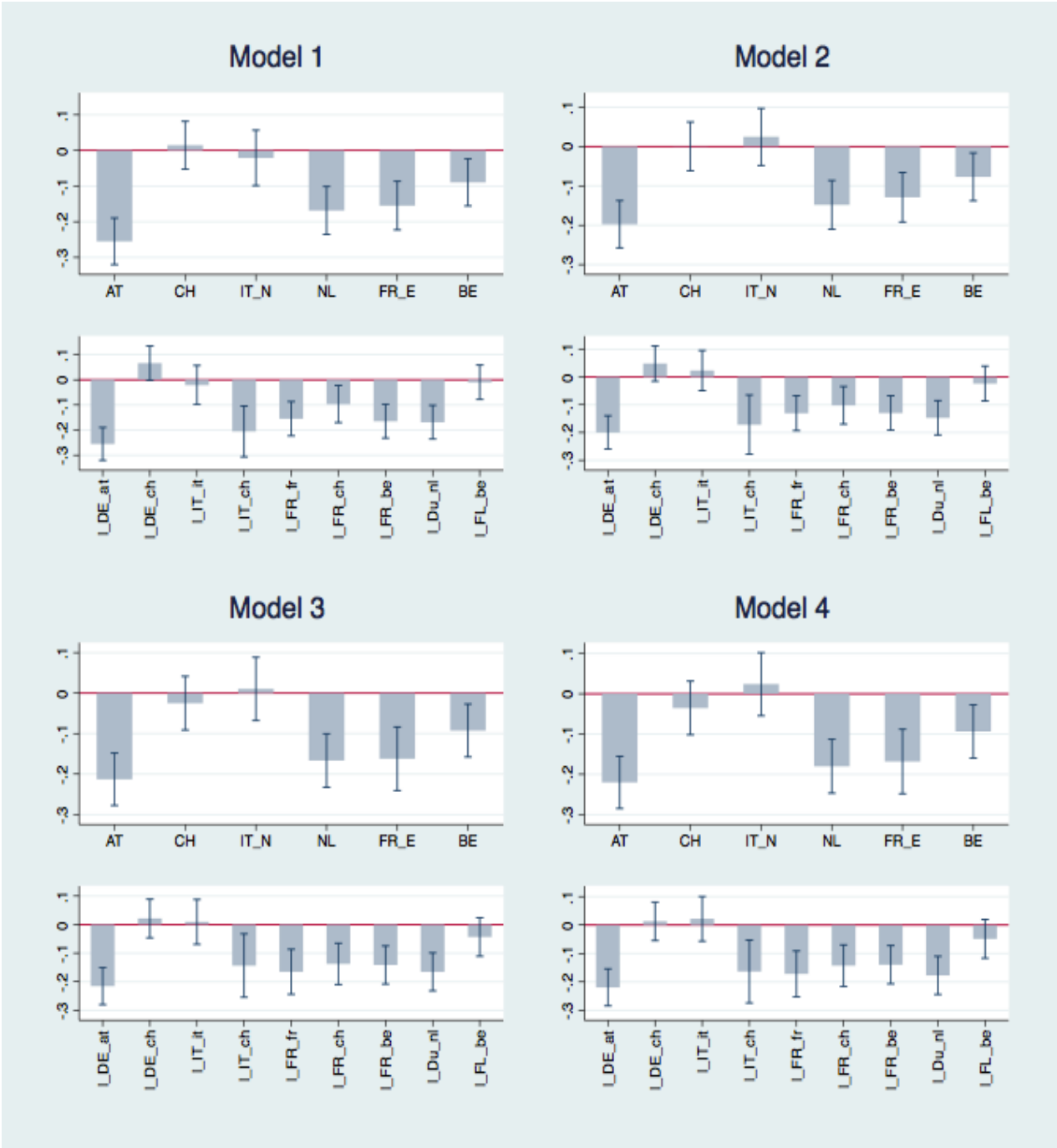
Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Below there is graphical evidence about influence of each of 4 variables-block on country and linguistic communities' dummies as deviations from the reference categories (i.e. South Germany and German-speakers, living in South Germany). See panels 1 – 4.

Looking at the Model 4 (the last panel of the Table 11), an additional remark must be made with respect to this financial behavior. The older population in Belgium as a country is less likely to hold risky assets than the reference country (South Germany). However, this fact should be attributed to its French-speakers' behavior, while Belgian Flemish-speakers behave similarly to the reference group. Also Switzerland as a country is indistinguishable from South Germany, but this is only because of the behavior of the country's German-speakers (which is identical to the reference group), while French- and Italian-speaker respondents are significantly less likely to hold risky assets.

Table 11: Graphical illustration for influence of the 4 Models on country (the upper plot in each panel) and linguistic communities' dummies (the lower plot in each panel), as deviations from South Germany and German-speakers in South Germany (respectively)



### 3 Outcome: Risky Assets (holding stocks and/or bonds and/or mutual funds) plus individual retirement accounts (IRA)

Table 12 shows that – even after accounting for a wide set of controls – belonging to different linguistic communities (especially to the Francophone community) matters also in determining holding of Risky Assets plus IRA. As to the German-speakers, different models do not change much the coefficients of Austrians, who are significantly less likely to hold this type of financial assets than the reference group, while Swiss German-speakers are significantly more likely to hold them than the reference group; however the magnitude of the coefficient decreases after adding each new variables block. Dutch are almost unaffected by addition of explanatory variables and are significantly less likely to hold this type of assets than the reference group, while Flemish are significantly more likely than the reference group and addition of each variables-block causes decrease in significance and magnitude of the coefficient, especially after adding the **subjective preferences**. The Post-Estimation Results of the F-Test (Table 15) confirm that no variables-block in my models is able to explain the fact that the identity in this financial behavior must be rejected among German-speakers, as well as among Dutch and Flemish-speakers.

As to Italian-speakers in the North of Italy and the Italian-speakers in Switzerland, as well as (especially) the Francophone communities, the picture is more involved. Italian-speakers in Northern Italy are indistinguishable from the reference group, however the magnitude of the coefficient is decreasing with each additional block of variables and after adding **cultural** ones, the sign becomes **positive**. Swiss Italian-speakers are significantly less likely to hold this type of assets than the reference group, but significance and magnitude of the coefficient decrease after addition of the **objective characteristics** and especially after addition of the **subjective preferences**. The Post-Estimation Results of the F-Test (Table 15) confirm that for the Italian-speakers adding **risk-aversion** (political orientation is not significant in this model) makes less significant the rejection of the identity.

Finally, Belgian French-speakers are indistinguishable from the reference group, and unaffected by addition of the variable-blocks. The dummy for Swiss French-speakers is also insignificant; however the magnitude of its coefficient decreases with addition of

each variables block. Those in France are changing their sign to negative and become insignificant after adding **subjective preferences**, thereby becoming equivalent to other Francophone groups. The Post-Estimation Results of the F-Test (Table 15) shows that for the Francophone populations adding **risk-aversion** makes impossible the rejection of the identity in this financial behavior.

In addition (see Table 12 in Appendix II), again, being less risk-averse increases risky assets-holding plus IRA, however, as before, political orientation plays no role in determining this kind of behavior. Finally, the cultural traits, such as trusting other people, future looks good, attending a religious organization, and especially volunteering are positively and significantly correlated with assets-holding plus IRA; at the same time frequent prayer is negatively related with this type of financial behavior.

Table 12: OLS. Risky Assets plus IRA, 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Country/ Linguistic Communities Dummies								
AT	-0.208*** [0.034]		-0.166*** [0.031]		-0.177*** [0.034]		-0.191*** [0.034]	
CH	0.129*** [0.035]		0.095** [0.032]		0.079* [0.035]		0.063 [0.035]	
IT_N	-0.032 [0.040]		-0.004 [0.037]		-0.008 [0.041]		0.005 [0.041]	
NL	-0.147*** [0.035]		-0.141*** [0.032]		-0.155*** [0.035]		-0.175*** [0.035]	
FR_E	0.067 [0.036]		0.085** [0.033]		-0.01 [0.044]		-0.008 [0.045]	
BE	0.055		0.046		0.038		0.033	

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
	[0.035]		[0.031]		[0.034]		[0.035]	
l_DE_at		-0.208*** [0.034]		-0.168*** [0.031]		-0.180*** [0.034]		-0.191*** [0.034]
l_DE_ch		0.191*** [0.035]		0.154*** [0.032]		0.135*** [0.035]		0.121*** [0.036]
l_IT_it		-0.032 [0.040]		-0.006 [0.037]		-0.009 [0.041]		0.002 [0.041]
l_IT_ch		-0.182*** [0.055]		-0.159** [0.057]		-0.124* [0.059]		-0.135* [0.060]
l_FR_fr		0.067 [0.036]		0.084* [0.033]		-0.014 [0.044]		-0.012 [0.045]
l_FR_ch		-0.002 [0.039]		-0.029 [0.035]		-0.049 [0.038]		-0.056 [0.039]
l_FR_be		-0.032 [0.035]		-0.018 [0.032]		-0.027 [0.035]		-0.031 [0.036]
l_Du_nl		-0.147*** [0.035]		-0.140*** [0.032]		-0.153*** [0.035]		-0.171*** [0.035]
l_FL_be		0.147*** [0.036]		0.111*** [0.032]		0.105** [0.035]		0.096** [0.036]
_cons	0.419*** [0.034]	0.419*** [0.034]	0.007 [0.059]	0.084 [0.059]	0.045 [0.065]	0.124 [0.065]	-0.006 [0.068]	0.084 [0.067]
Controls			V	V	V	V	V	V
N	13871	13871	13639	13639	11260	11260	10923	10923
r2	0.075	0.092	0.227	0.238	0.266	0.277	0.27	0.281

Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Below there is graphical evidence about influence of each of 4 variables-block on country and linguistic communities' dummies as deviations from the reference categories (i.e. South Germany and German-speakers, living in South Germany). See panels 1 – 4.

Looking at the panel for the Model 4 (the last panel of the Table 13), we remark that with respect to this financial behavior Switzerland as a country behaves indistinguishably from the reference country (South Germany). However, this is due to the fact that Italian-speakers are less likely to have this kind of assets than the reference group; and the French-speakers are indistinguishable from the reference group. However, as was mentioned above, the Swiss German-speakers are significantly more likely to have this asset than the reference group. A similar picture is observed with respect to Belgium. As a country it is indistinguishable from South Germany, which is due to the behavior of the French-speakers, while (as was mentioned above) the Belgian Flemish-speakers are significantly more likely to have this asset than the reference group.

Table 13: Graphical illustration for influence of the 4 Models on country (the upper plot in each panel) and linguistic communities' dummies (the lower plot in each panel), as deviations from South Germany and German-speakers in South Germany (respectively)

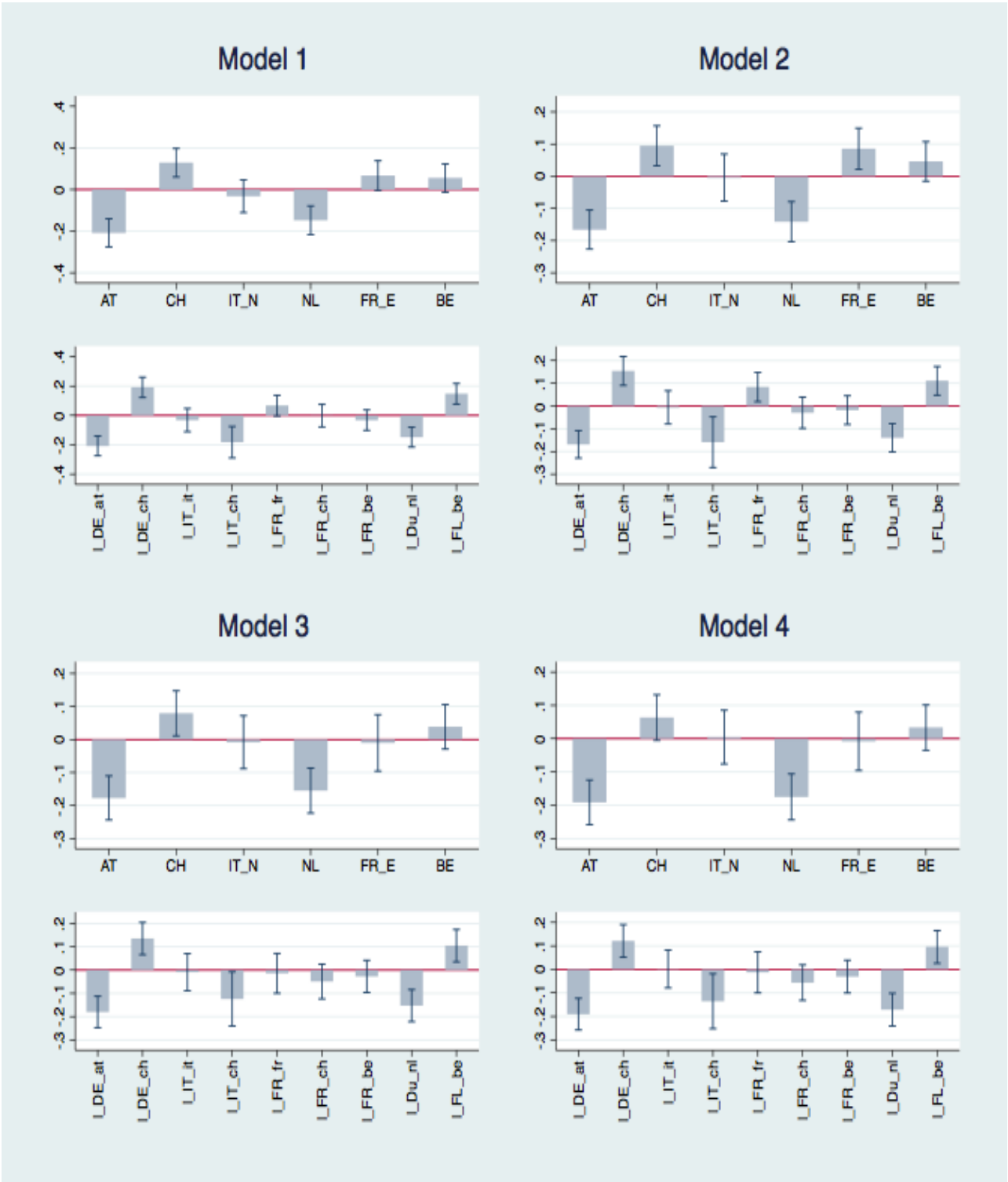




Table 15. Post-Estimation: Results of the F-Test for Equality of Language Interactions Dummies

	Model 1	Model 2	Model 3	Model 4
F- Test	P-value	P-value	P-value	P-value
<b>Pure Stocks-Holding (direct and indirect)</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	0.0000	0.0011	0.0542	0.0906
test (_b[l_IT_it] = _b[l_IT_ch])	0.9885	0.7766	0.5245	0.7305
test (_b[l_DE_at] = _b[l_DE_ch]=0)	0.0000	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	0.0000	0.0000	0.0000	0.0000
<b>Risky Assets (holding of stocks and bonds and/or mutual funds)</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	0.0039	0.3130	0.5951	0.4777
test (_b[l_IT_it] = _b[l_IT_ch])	0.0001	0.0001	0.0033	0.0003
test (_b[l_DE_at] = _b[l_DE_ch]=0)	0.0000	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	0.0000	0.0000	0.0000	0.0000
<b>Risky Assets plus IRA</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	0.0000	0.0000	0.4884	0.3677
test (_b[l_IT_it] = _b[l_IT_ch])	0.0019	0.0037	0.0348	0.0119
test (_b[l_DE_at] = _b[l_DE_ch]=0)	0.0000	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	0.0000	0.0000	0.0000	0.0000

**For all the Kinds of Financial Behavior, in Switzerland and Belgium all the Linguistic Communities Behave Differently**

Finally, and perhaps very importantly, the results of the F-Test (Table 16) show that for all the three kinds of financial behavior (holding of Stocks, Risky Assets and Risky Assets plus IRA), after controlling for all possible determinants of private financial behavior, the hypothesis that the linguistic groups in Switzerland (German-, Italian- and

French-speakers) behave identically in the country's financial market must be rejected, despite the isomorphism of the financial and other institutions. The same is true for the French- and Flemish-speakers in Belgium. In other words, the behavior of different linguistic groups isn't the same, despite they face identical institutions.

Table 16. F-Test for Equality of Language Groups in Switzerland and Belgium, Same Results for all the three Outcomes: holding of Stocks, Risky Assets and Risky Assets plus IRA

	Model 1	Model 2	Model 3	Model 4
F- Test	<b>P-value</b>	<b>P-value</b>	<b>P-value</b>	<b>P-value</b>
test (_b[l_DE_ch] = _b[l_FR_ch]=_b[l_IT_ch])	0.0000	0.0000	0.0000	0.0000
test (_b[l_FR_be] = _b[l_FL_be])	0.0000	0.0000	0.0000	0.0000

## 7. Discussion

The limited participation of older households in the financial market has received considerable attention in the economic literature. There are several reasons for this. In the recent decades European Union faces multiple macro-economic processes, such as increasing dependency ratios and the pressure of reforms calling for harmonization of institutions and policies across the member states (Haliassos *et al.*, 2014). Governments responded to these processes by attempts to liberalize financial markets in order to encourage the wide society to exploit the new financial instruments. First, massive entrance of retirees and workers was expected to bring supplementary retirement income in order to address the declining provision of public social security. The second aim was to change political preferences to “enhance the popularity of capitalism and *laissez faire* by allowing more people to own a share of the pie” (Guiso *et al.*, 2003). However, as Haliassos, Jansson and Karabulut (2014) put it considerable cultural diversity in Europe raises the question, whether harmonization of institutions and policies is plausible, given that diverse cultural predispositions of European communities lead to substantial differences in financial behavior.

The previous research found striking differences in financial behavior among older adults across European countries. Recently many other noneconomic factors were found as important determinants of the household finance behavior of older adults, such as effects of social institutions and culture. However, belonging to different linguistic groups in a country; or to the same linguistic group across different countries was usually neglected as a possible predictor of financial behavior. This study fills this gap in the research and compares financial behavior (namely, holding stocks, bonds, mutual funds and/or individual retirement accounts) of older adults, belonging to 10 different European linguistic communities: German-speakers in South Germany, German-speakers in Austria and in Switzerland; Italian-speakers in Northern Italy and those in Switzerland; French-speakers in East France, in Belgium and in Switzerland; and finally Dutch in the Netherlands and Flemish in Belgium. I hypothesized that belonging to different linguistic communities in Europe might serve as a proxy for a *latent construct* of having/lacking tastes, skills and values that are necessary for holding stocks, bonds, mutual funds and/or IRA. My second hypothesis was that if belonging to a linguistic community matters, it might explain some of the cross-country differences in all the three outcomes. The research question was: *Does belonging to a linguistic community in Europe matter in determining the three kinds of financial behavior of older adults?* Main findings provide support for my hypotheses.

1. Speaking Italian (either in Italy or in Switzerland) and French (in France, Belgium and Switzerland) is responsible for identical holding of stocks (directly or indirectly) within these groups in the respective countries. Both groups behave almost indistinguishably from the German-speakers in Germany (the reference group). In addition, speaking French predicts identical behavior with respect to holding risky assets across all the three countries. French-speakers are significantly less likely to hold these assets than the German-speakers in Germany. Finally, French language is associated with identical holding of risky assets plus IRA across the three countries; French-speakers are indistinguishable from the reference group. This persistence of behavior is observed despite the respondents are living in different institutional contexts and after accounting for a rich set of household characteristics.

2. Importantly, for all the three kinds of financial participation (holding of stocks, risky assets and/or risky assets plus IRA), after controlling for all possible determinants of private financial decisions, the behavior of different linguistic groups in Switzerland and Belgium isn't the same, despite they face identical institutions.

3. The financial behavior of German-speakers is different across countries for all the three outcomes. Considering the pure stock-holding, while Austrians are significantly less likely to hold this type of assets than Germans in the South Germany, after introducing all the controls the Swiss German-speakers behave identically to those in South Germany. The same applies to holding of the risky assets. When considering risky assets plus IRA, Austrians are again significantly less likely to hold this type of assets than Germans in the South Germany, while Swiss German-speakers are significantly more likely to hold this type of assets than the reference group.

4. Also the financial behavior of Dutch- and Flemish-speakers is different for all the three outcomes. Considering the pure stock-holding, the Dutch and Flemish-speakers are indistinguishable from the reference group; however the coefficient for the Dutch dummy is negative, while for the Flemish it is positive. With respect to the risky assets, Dutch are significantly less likely to hold this type of assets than the reference group, while Flemish are indistinguishable from it. Finally, when considering risky assets plus IRA, Dutch are again significantly less likely to hold also this type of assets than the reference group, while Flemish are significantly more likely to hold this type of assets than the reference group.

5. With respect to holding risky assets, Italian-speakers in the North of Italy and the Italian-speakers in Switzerland behave differently. Italian-speakers in Northern Italy are indistinguishable from the reference group, while Swiss Italian-speakers are significantly less likely to hold this type of assets than the reference group. Finally, when risky assets plus IRA is considered, Italian-speakers in Northern Italy are also indistinguishable from the reference group. Swiss Italian-speakers are significantly less likely to hold also this type of assets than the reference group. This finding is consistent with the pattern of holding the governmental bonds, predominant in Italy. As was mentioned above, Guiso and Jappelli (2002) document that Italian households are still characterized by the old tradition of holding their financial wealth in the form of transaction accounts or Italian governmental bonds.

Another important result of my analysis is decomposing some of the cross-country differences:

6. Although older population in Belgium as a country is less likely to hold risky assets (stocks, bonds, mutual funds) than the reference country (South Germany), this fact should be attributed to its French-speakers' behavior. However, Belgian Flemish-speakers behave similarly to the reference group. Also Switzerland as a country is indistinguishable from South Germany, but this is only because of the behavior of the country's German-speakers (which is identical to the reference group), while French- and Italian-speakers are significantly less likely to hold risky assets.

7. Although older population in Switzerland as a country behaves indistinguishably from the reference country (South Germany) with respect to holding risky assets plus IRA, this is due to the fact that Italian-speakers are less likely to have this kind of assets than the reference group; and the French-speakers are indistinguishable from the reference group. However, the Swiss German-speakers are significantly more likely to have this asset than the reference group. A similar picture is observed with respect to Belgium. As a country it is indistinguishable from South Germany, which is due to the behavior of the French-speakers, while the Belgian Flemish-speakers are significantly more likely to have this asset than the reference group.

I summarize these findings by a statement that belonging to a linguistic community in Europe matters in determining the three kinds of financial behavior of older adults. Next I provide interpretation for these findings. In the current investigation I use a set of social/cultural variables, available in SHARE: trusting others, risk preferences, political preferences, optimism, sense of control, volunteering, and religiosity. However, as was hypothesized they do not capture all cultural differences in financial behavior. Namely, the linguistic communities dummies remain significant also after adding the available measures of preferences and cultural/social characteristics, therefore, as was hypothesized, belonging to European linguistic communities might include some latent cultural aspects. For example, because in the data that I have at my disposal, there are no direct questions about such cultural features as thrift, hard work, tenacity, honesty, tolerance etc., I hypothesize that they might be proxied by linguistic communities. The “linguistic communities” might contain certain skills and world views that are important

predictors for holding financial instruments. For example, these skills and opinions might not be at the disposal of such linguistic groups as French-speakers, Italian-speakers and German-speakers in Austria. Hence, for these linguistic communities the explanation of persistent cultural predisposition may apply. However, for example, the difference between the Dutch and the Flemish communities may deal with the negative side of liberalization policies.

One explanation for persistence of the cultural predispositions may relate to stable religious beliefs and institutions; the other might be connected to the Early-Life conditions and inheritances from family. Thus, for Switzerland, Max Weber's reasoning might apply, since the division between Protestants and Catholics in Switzerland is pronounced and corresponds to German as opposed to the French and Italian linguistic communities. It should be remembered that in Switzerland the institutional environment is identical (Eugster *et al.*, 2011), hence language bears some persistent cultural characteristics. As was stated above, the Protestant ethics puts stress on such attitudes as hard labor and avoiding enjoyment of wealth, as well as idleness. This fact may explain why in Switzerland the German-speakers are more likely to rely on use of financial instruments than other Swiss communities. The same reasoning might explain why Catholic German-speakers in Austria are less likely to hold all the kinds of financial instruments than Swiss German-speakers.

However, given the identity of the behavior of the French-speakers across-countries, it also might be that the finding should be attributed to some specificities of the French language/culture, which might also serve as an explanation for the differences between the French and Flemish communities in Belgium. Language is a "slowly-moving component of culture," i.e. it is not so easy to change it. Specifically, the pervasive role of the mother-tongue must be considered, being a part of the Early-Life Conditions. Mother-tongue acquisition occurs early in life. Hence, it is one of the parameters that parents and other early life agents teach children in the same form as they themselves have learned from the previous generations (Bisin and Verdier, 2000). Therefore, the mother-tongue bears "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (Guiso *et al.*, 2006). For example, France (and, perhaps, the "Latin" cultures, in general) is consistently described

as a country with relatively low financial and computer literacy, as well as low transparency of financial institutions (Guiso *et al.*, 2003). In addition, the authors claim, mutual funds are mostly distributed by banks in a concentrated way, rather than by brokers (as in Anglo-Saxon cultures). It might be conjectured that all these equally apply to the “French tradition” in general. Another aspect is a possible specificity of the French communication-skills culture, with higher reliance on advice of specialists, rather than on personal effort. With respect to the increased participation in the financial market Guiso, Haliassos and Jappelli (2003) point out to a problem of biased *interpretation* of the information, provided by bank clerks to the investors. This problem might arise if the culture promotes reliance on explanations by bank clerks, rather than active acquisition of financial literacy. In general, mother-tongue as a part of the Early-Life environment leads to formation of cognitive and non-cognitive skills, which are key determinants of the economic success of children at an adult age (Mazzonna, 2014). As an early life endowment, it may capture transmission of such important for later financial behavior qualities as: the preference to rely on authority (and thus giving up personal opinion in favor of an ‘expert’s’ view) vs. forming own independent opinion, based on acquired knowledge. In addition, if in accordance with Licht, Goldschmidt and Schwartz (2007) view, language is the stable factor that constrains the development of cultural norms, then little might be done to decrease the pervasiveness of the mother-tongue influence.

The differences between the Dutch and Flemish populations might relate to institutional differences between the Netherlands and Belgium. The Netherlands is characterized as one of the most liberalized economies in the EU. The Netherlands and Sweden are countries where social security has a more limited role than in other European countries (Guiso *et al.*, 2003; see also Table 1). The Netherlands is characterized by higher transparency of financial institutions. Finally, the share of the stock market held by Dutch banks is zero, meaning that the stock market is completely privatized and open to the general public. These facts, as was explained above, apparently led to massive entrance of inexperienced investors. New entrants are likely to be of lower education than experienced stockholders and to have fewer financial means at their disposal to withstand the ups and downs of the stock market. Since education tends to correlate negatively with risk aversion, the new entrants are also likely to be more risk

averse (Guiso *et al.*, 2003). Thus, first Dutch older households might feel less protected (due to lower social security coverage) to participate in risky exchanges. Instead Belgians, who have more generous public pension system, might feel more protected and less afraid to invest in the risky assets. Second, as was mentioned above, using financial instruments might not only bring opportunity to increase income, but also increased risks. “Excessive or ill-advised trading of stocks can significantly reduce realized returns, and poor judgment in allocating retirement wealth can create major financial distress at a point in the lifecycle where the potential for offsetting adjustments is quite limited” (Guiso *et al.*, 2003, p. 126). Losses may be irreversible when incurred by persons close to retirement. All these considerations raise the possibility of massive exodus from the stock market. Apparently, this is what we observe in the SHARE, wave 4 (2010/11) data, i.e. the massive exodus from the stock market and/or feeling of lack of financial security among the Dutch older investors.

This study has several limitations, which also serve as opportunities for future research. Four aspects in particular seem worth mentioning here. First, as follows from the discussion about the Netherlands and Belgium, the following research must account for institutions. Indeed, as Tabellini (2010) claims, an important question is whether the effect of culture on economic outcomes survives the inclusion of variables measuring features of institutions. However, Haliassos, Jansson and Karabulut (2014) already have shown that both the cultural background and institutional environment are important determinants of households’ financial behavior.

Next important issue is using the “reduced form approach.” Although a very rich dataset, SHARE provides quite limited information on respondents’ relevant beliefs and opinions; hence I have to link directly the cultural background (belonging to a linguistic community) to financial behavior. In relation to this aspect Haliassos, Jansson and Karabulut (2014) state that regressions of outcomes directly on cultural differences are less informative about the nature of the channel through which culture influences economic outcomes than are studies that explore a specific cultural feature. However, in the latter case an opposite problem arises that cultural differences, such as a linguistic community, might affect financial behavior through multiple cultural features, beyond one which is studied. Nevertheless, it is not possible to control for all the channels.



Indeed, Tabellini (2010) maintains that “culture” is still a black box. Much more work is needed at a microeconomic level to understand which features of individual beliefs and social norms are economically relevant... and how they interact with the institutional environment” (p. 711). Due to these reasons, as I have already cited, existing research uses the “reduced form approach,” despite the possible limitation.

Third, it must be remembered that in Switzerland a couple could speak a few languages, or in other words couples might be mixed with respect to the linguistic community, but they must choose a language to answer the interview. What might be the interpretation of my results in this case? I assumed that the mixed couples of 50 and older are not a common case, and rather their proportion is negligible. Moreover, the language that they choose to answer the questionnaire is the one they feel more comfortable for communication within the household.

Lastly, I would like to point out to a very recent article by Cameron and Miller (2015). The authors raise concern about inference, when using models where observations can be grouped into clusters, with model “errors uncorrelated across clusters but correlated within cluster,” for example data, where observations are grouped according to village or a state. The issue is that errors for individuals in the same cluster may be correlated, while model errors for individuals in different clusters are assumed to be uncorrelated. In theory, “failure to control for this within-cluster error correlation can lead to using standard errors that are too small, with consequent overly-narrow confidence intervals, overly-large t-statistics, and over-rejection of true null hypotheses” (p. 5). However, the authors also mention that in *practice* “**it is possible for cluster-robust errors to actually be smaller than default standard errors**” (p. 17). One of the main assumptions for using this method is that the number of clusters ( $G$ ) is very large, or tends to infinity. In particular, “the cluster-robust estimate of the variance matrix (CRVE) of the OLS estimator  $\hat{V}_{clu}[\hat{\beta}]$  is consistent, as  $G \rightarrow \infty$  (p. 8). In addition, in “richly specified model with thousands of observations in far fewer clusters, leading to more regressors than clusters, the  $\hat{V}_{clu}[\hat{\beta}]$  is **rank-deficient**, so it will not be possible to perform an overall F test of the joint statistical significance of all regressors (p. 11). Unfortunately, in my case the number of clusters (10 linguistic communities) is far from infinity, thus the assumption for consistent estimate of CRVE is violated. Moreover, I have much more

regressors than clusters, hence I am not able to compute the F test. Finally, when using OLS, “the cluster-robust standard errors should be multiplied by the square root of  $[N-(K-1)]/[N-G-(K-1)]$ , especially if  $G$  is small” (p. 15). However, again, since my  $G$  (10 linguistic communities) is too small, then this number is  $\sqrt{[N-(K-1)]/[N-G-(K-1)]} \approx 1$ . In spite of these possible limitations, I addressed this issue in the Appendix III by running the regression with clustering by linguistic communities. All in all, the results in the Appendix III look unreliable, since contrary to what is expected in theory, in practice I receive very small standard errors, much smaller than the standard errors robust for heteroskedasticity. Therefore, clustering does not help to solve the issue with model “errors uncorrelated across clusters but correlated within cluster.” Thus, little can be done rather than simply taking that issue into account, when interpreting the results presented in this paper.

In conclusion, a few remarks are in place, concerning suggestions how to increase the limited participation of the older households in financial markets. In general there are two ideas. One is educational policies, while the second is public monitoring of financial dealers. Sizeable differences in financial behavior between the linguistic communities may suggest the need for policies to iron out cultural predispositions to be able to meet the call for harmonization of institutions across European Union (Haliassos *et al.*, 2014). However, one may wonder how effective such policies could be if the differences arise due to early-life circumstances, as seems to be the case in Switzerland and Belgium according to the current research and in the light of findings by Haliassos, Jansson and Karabulut, 2014 that statistically significant differences remain across different cultural groups of immigrants to Sweden, even among those who have spent the longest time in the host country and among those who have become very assimilated. Second, and perhaps related, a set of policies is suggested by different authors (e.g. Guiso *et al.*, 2003) calls for developing programs to provide the “unsophisticated” investors with basic financial education. For these scholars such programs could lead to lower dependence on the advice of the non-neutral financial brokers, as well as to lower delegation of the portfolio management, thus reducing the risk of frauds by mutual funds’ managers (as was described above). The second suggestion is public monitoring and supervision of private financial institutions. In particular, it is advised that governments should “punish

collusive behavior and discourage practices aimed at limiting customer mobility across intermediaries” (Guiso *et al.*, 2003:163).

To summarize, I have empirically confirmed that belonging to a linguistic community in Europe matters for determining the three kinds of financial behavior of older adults. Although I control for a set of current social/cultural variables, available in SHARE, trusting others, risk preferences, political preferences, optimism, sense of control, volunteering, and religiosity, they do not capture all cultural differences in financial behavior. Particularly, the linguistic communities’ dummies remain significant also after controlling for the latter variables. It might be plausibly conjectured that belonging to European linguistic communities might include some latent cultural aspects that my data do not contain, e.g. independent thinking, lower reliance on experts’ advice, propensity to invest, intuition or courage. Since linguistic community is a “slow moving” aspect of culture, which mostly reflects mother-tongue and thus the early life influences, then my findings imply that financial behavior of older households is, at least partly, the result of the life course. This claim raises question about effectiveness of such policy suggestions as “well-designed financial education programs” (van Rooij, *et al.*, 2011), especially, when targeted at linguistic communities, which do not have appropriate tastes, values and/or skills. Perhaps, interventions might be more effective at the earlier phases of the life-course.

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APPENDIX I

Graphical Evidence: Selected Social and Cultural Variables by Linguistic Community

Figure 7. Proportion of HH's NOT willing, to take any risk when saving or making investments

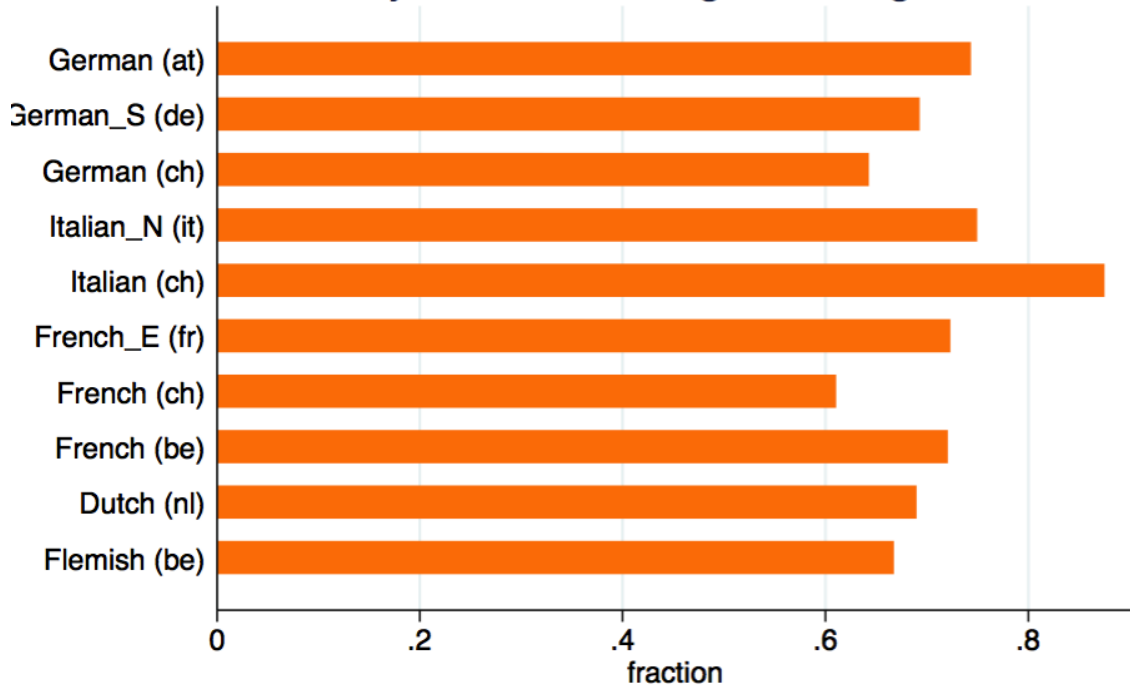




Figure 8. Proportion of HH's with volunteers or participants in a political/community organization  
Last Year, where possible. Otherwise, Last Month

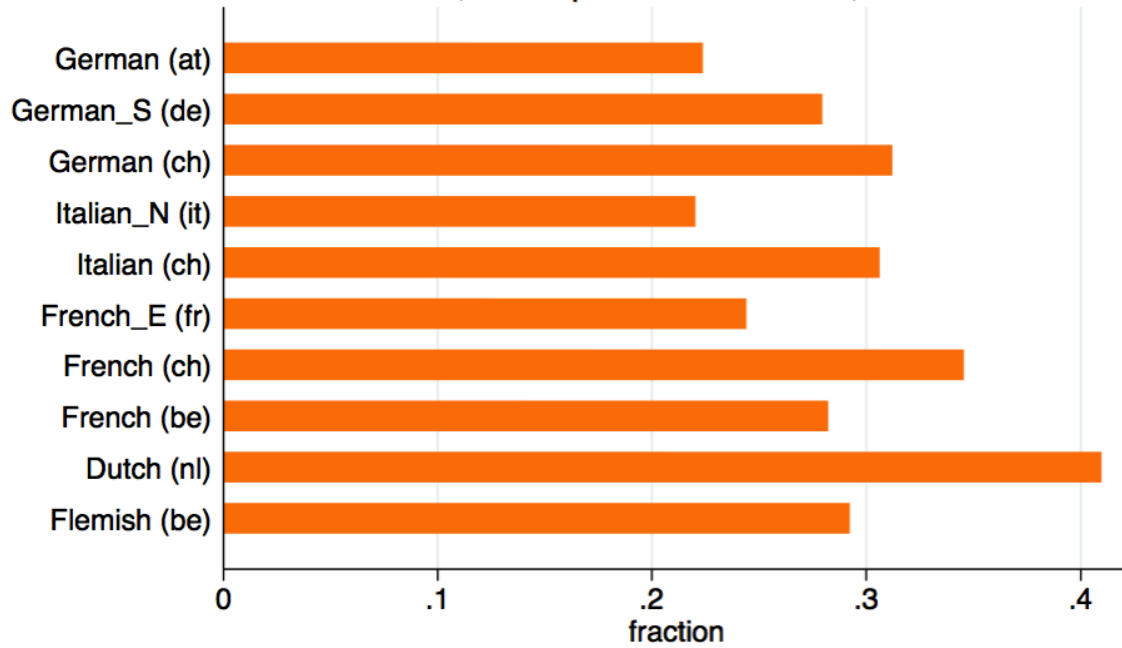


Figure 9. Proportion of HH's with participants in a religious organization  
Last Year, where possible. Otherwise, Last Month

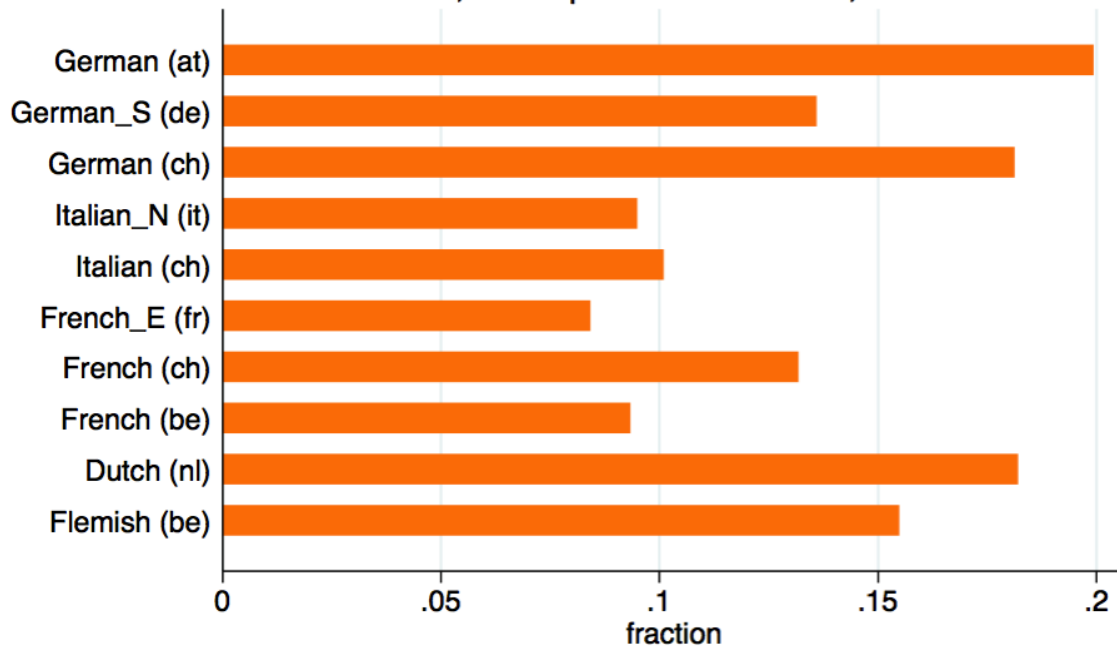


Figure 10. Proportion of HH's feeling that what happens is Rarely or Never out of their Control

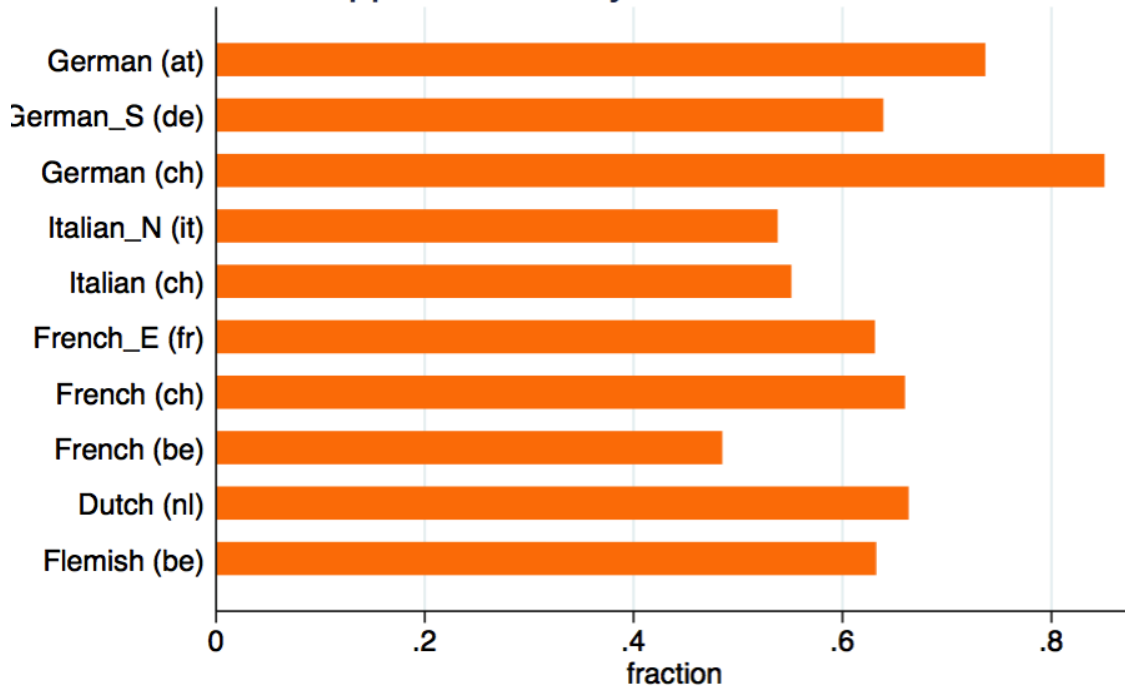


Figure 11. Proportion of HH's saying feel Life is Full of Opp Sometimes or Often

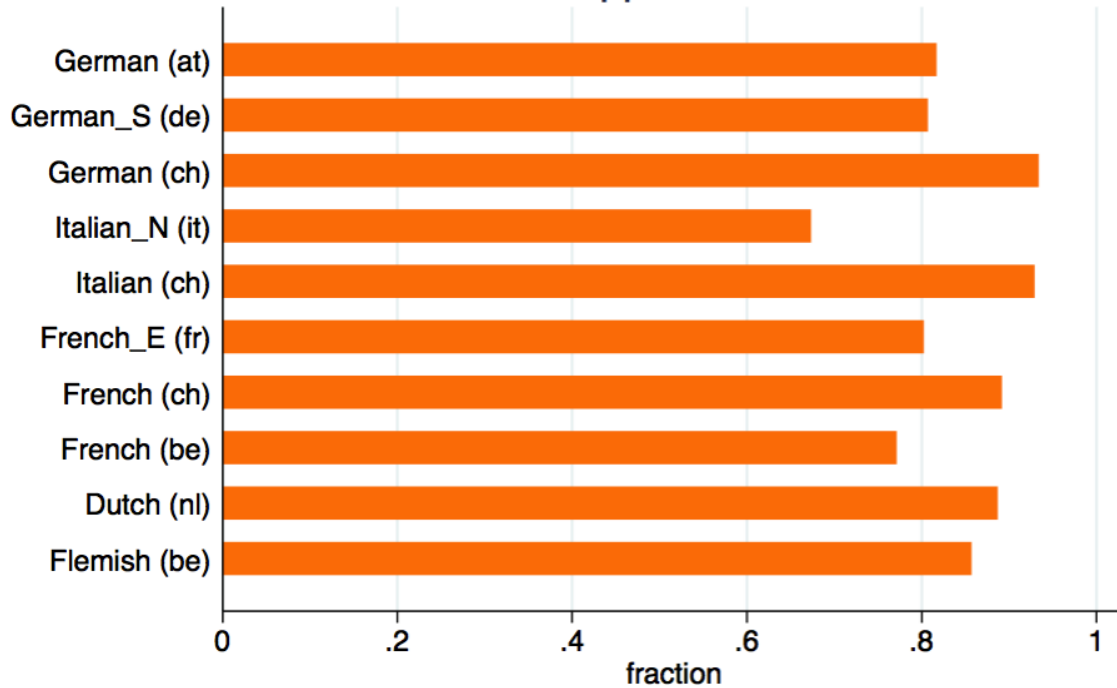


Figure 12. Proportion of HH's saying feel Future Looks Good Sometimes or Often

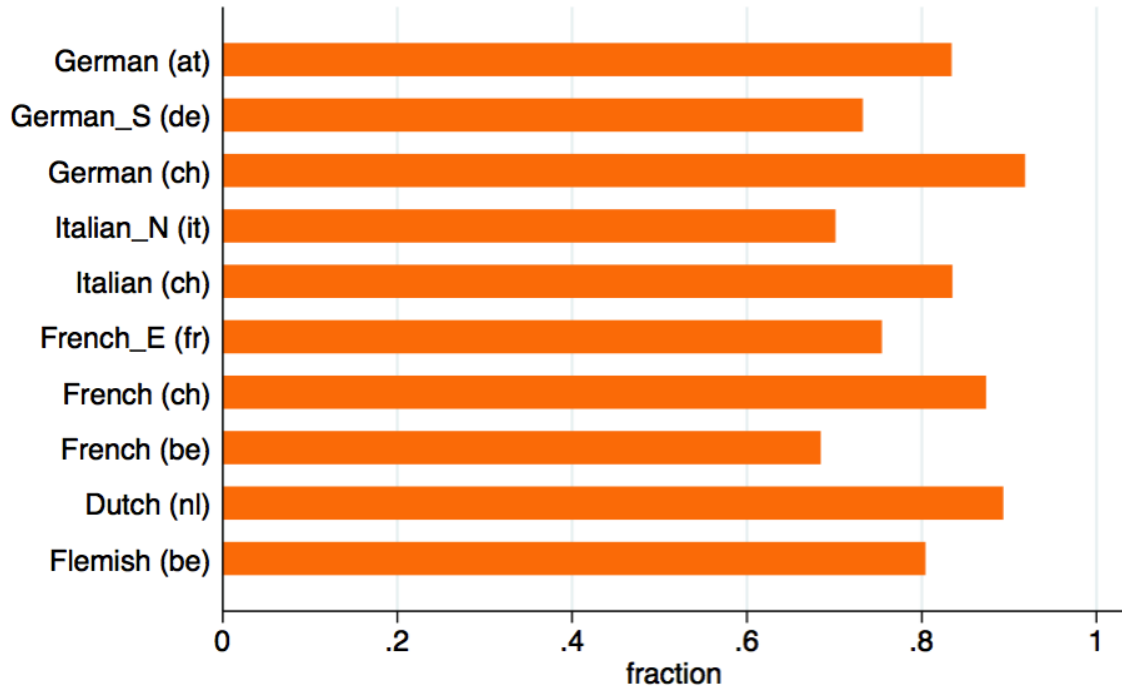
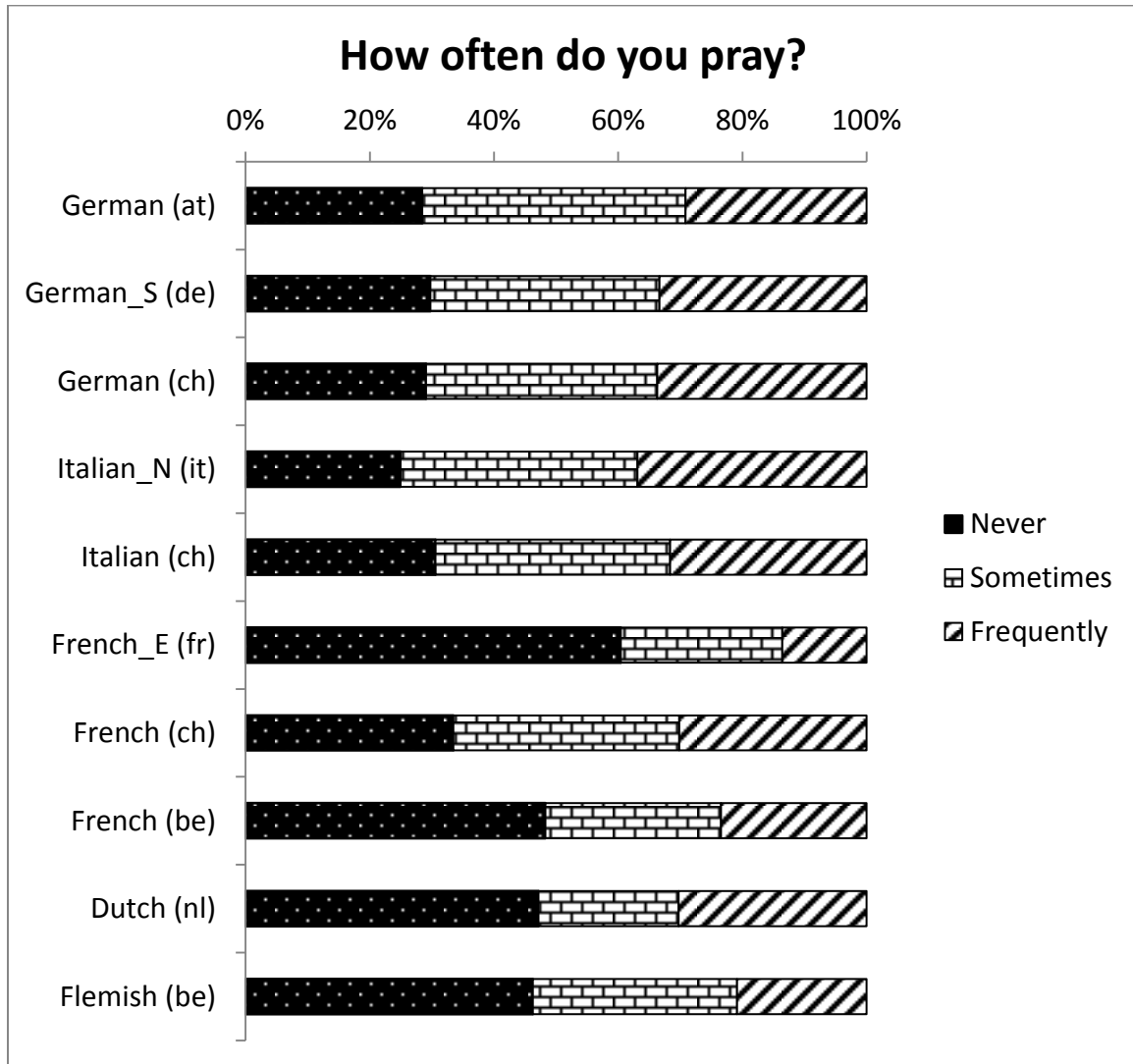


Figure 13. Trust in God by Linguistic Community



French\_E (fr), 1,135 missing values

## APPENDIX II

### Linear Probability Models

Model 1	Only Country/Language Interactions Dummies
Model 2	Country/Language Interactions Dummies + Objective Characteristics
Model 3	Country/Language Interactions Dummies + Objective Characteristics + Subjective preferences
Model 4	Country/Language Interactions Dummies + Objective Characteristics + Subjective preferences + Social/Cultural Characteristics

Table 8 shows – in addition to the main findings reported in the paper – that the significant predictors of stock-market participation, even after accounting for the linguistic group, are having a very high score in numeracy test, having post-secondary education, belonging to 4<sup>th</sup> or 5<sup>th</sup> quintiles of real assets distribution, high income, having less children, being older and having higher household size.

Table 8: LPM. OLS. Pure Stocks-Holding (direct and indirect), 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.176*** [0.010]	0.175*** [0.010]	0.173*** [0.010]	0.173*** [0.010]
Low risk aversion					0.285*** [0.021]	0.287*** [0.021]	0.281*** [0.021]	0.283*** [0.021]
Rightist					0.006*** [0.002]	0.005** [0.002]	0.006*** [0.002]	0.005** [0.002]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			-0.008 [0.014]	-0.008 [0.014]	-0.01 [0.018]	-0.011 [0.018]	-0.009 [0.019]	-0.009 [0.019]
3.Numeracy			-0.001 [0.013]	-0.001 [0.013]	-0.005 [0.017]	-0.005 [0.017]	-0.005 [0.019]	-0.004 [0.018]
4.Numeracy			0.025 [0.013]	0.025 [0.013]	0.016 [0.017]	0.015 [0.017]	0.013 [0.019]	0.014 [0.018]
5.Numeracy			0.082*** [0.015]	0.078*** [0.015]	0.066*** [0.019]	0.062*** [0.019]	0.063** [0.020]	0.060** [0.020]
Post- Secondary Education			0.074*** [0.008]	0.081*** [0.008]	0.048*** [0.008]	0.056*** [0.008]	0.040*** [0.009]	0.048*** [0.009]
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.008 [0.009]	0.011 [0.009]	0.004 [0.010]	0.007 [0.010]	0.002 [0.010]	0.005 [0.010]
3.Real Assets			0.018 [0.014]	0.023 [0.014]	0.019 [0.015]	0.024 [0.015]	0.016 [0.015]	0.021 [0.015]
4.Real Assets			0.062*** [0.014]	0.063*** [0.014]	0.044** [0.015]	0.047** [0.015]	0.036* [0.015]	0.039** [0.015]
5.Real Assets			0.170*** [0.014]	0.171*** [0.014]	0.139*** [0.015]	0.140*** [0.015]	0.130*** [0.016]	0.133*** [0.016]
IHS of ppp- adjusted			0.030***	0.026***	0.024***	0.020***	0.023***	0.019***

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
household income			[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Home Ownership			-0.005 [0.012]	-0.008 [0.012]	-0.002 [0.013]	-0.006 [0.013]	0 [0.013]	-0.004 [0.013]
Health (ADL limitations)			-0.005 [0.003]	-0.003 [0.003]	-0.007 [0.004]	-0.004 [0.004]	-0.003 [0.004]	-0.001 [0.004]
Female			-0.026*** [0.007]	-0.026*** [0.007]	0.003 [0.007]	0.003 [0.007]	0 [0.007]	0 [0.007]
Partner in HH			0.021* [0.009]	0.020* [0.009]	0.012 [0.009]	0.011 [0.009]	0.006 [0.010]	0.006 [0.009]
Age			0 [0.000]	-0.001 [0.000]	0.001* [0.000]	0.001 [0.000]	0.001* [0.000]	0.001* [0.000]
HH size			0.010* [0.004]	0.011* [0.004]	0.010* [0.005]	0.011* [0.005]	0.010* [0.005]	0.010* [0.005]
Number of Children			-0.007*** [0.002]	-0.007*** [0.002]	-0.008*** [0.002]	-0.008*** [0.002]	-0.009*** [0.002]	-0.009*** [0.002]
Trusting other people							0.005*** [0.002]	0.004** [0.002]
Control							0.002 [0.008]	-0.005 [0.008]
Life is full of opportunities							0.007	0.006

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
							[0.010]	[0.009]
Future looks good							0.021* [0.010]	0.017 [0.010]
Volunteering							0.020* [0.008]	0.022* [0.008]
Religious organization							0.021* [0.010]	0.017 [0.010]
Prayer								
1b.Never							0 [.]	0 [.]
2. Sometimes							0.018* [0.009]	0.017 [0.009]
3. Frequently							-0.013 [0.010]	-0.012 [0.009]
AT	-0.151*** [0.029]		-0.105*** [0.027]		-0.113*** [0.030]		-0.120*** [0.030]	
CH	0.04 [0.030]		0.032 [0.028]		0.021 [0.031]		0.014 [0.031]	
IT_N	-0.107** [0.033]		-0.071* [0.030]		-0.084* [0.034]		-0.076* [0.034]	
NL	-0.047 [0.030]		-0.028 [0.028]		-0.037 [0.031]		-0.045 [0.031]	
FR_E	-0.036 [0.031]		-0.014 [0.028]		-0.007 [0.038]		-0.005 [0.039]	



Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
BE	-0.02 [0.030]		-0.008 [0.027]		-0.014 [0.031]		-0.012 [0.031]	
l_DE_at		-0.151*** [0.029]		-0.107*** [0.027]		-0.115*** [0.030]		-0.120*** [0.030]
l_DE_ch		0.072* [0.031]		0.062* [0.028]		0.052 [0.032]		0.048 [0.032]
l_IT_it		-0.107** [0.033]		-0.071* [0.030]		-0.085* [0.034]		-0.078* [0.034]
l_IT_ch		-0.106* [0.044]		-0.083 [0.046]		-0.058 [0.049]		-0.063 [0.049]
l_FR_fr		-0.036 [0.031]		-0.014 [0.028]		-0.009 [0.038]		-0.007 [0.039]
l_FR_ch		-0.027 [0.033]		-0.028 [0.031]		-0.053 [0.034]		-0.057 [0.034]
l_FR_be		-0.088** [0.030]		-0.060* [0.028]		-0.067* [0.031]		-0.063* [0.031]
l_Du_nl		-0.047 [0.030]		-0.026 [0.028]		-0.036 [0.031]		-0.042 [0.031]
l_FL_be		0.052 [0.031]		0.047 [0.028]		0.042 [0.032]		0.041 [0.032]
_cons	0.231*** [0.029]	0.231*** [0.029]	-0.204*** [0.047]	-0.152** [0.046]	-0.270*** [0.052]	-0.215*** [0.052]	-0.319*** [0.054]	-0.256*** [0.054]
N	13749	13749	13516	13516	11178	11178	10842	10842
r2	0.032	0.044	0.13	0.137	0.18	0.188	0.182	0.189

Robust standard errors in brackets  
\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 10 shows that – in addition to the main findings reported in the paper – other significant predictors of holding risky assets are having a very high score in Numeracy test, having post-secondary education, belonging to 4<sup>th</sup> or 5<sup>th</sup> quintiles of real assets distribution, high income, having less children and being older.

Table 10: OLS. Risky Assets (holding of stocks and bonds and/or mutual funds), 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.239*** [0.010]	0.238*** [0.010]	0.234*** [0.010]	0.234*** [0.010]
Low risk aversion					0.293*** [0.021]	0.296*** [0.021]	0.288*** [0.021]	0.292*** [0.021]
Rightist					0.004* [0.002]	0.003 [0.002]	0.004 [0.002]	0.003 [0.002]
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			-0.005 [0.017]	-0.006 [0.017]	-0.013 [0.022]	-0.013 [0.022]	-0.021 [0.024]	-0.02 [0.024]
3.Numeracy			0.026 [0.016]	0.027 [0.016]	0.019 [0.021]	0.021 [0.021]	0.011 [0.023]	0.013 [0.023]
4.Numeracy			0.052** [0.016]	0.052** [0.016]	0.038 [0.021]	0.037 [0.021]	0.023 [0.023]	0.023 [0.023]
5.Numeracy			0.111*** [0.018]	0.105*** [0.018]	0.087*** [0.022]	0.081*** [0.022]	0.071** [0.024]	0.066** [0.024]
Post-Secondary Education			0.103*** [0.009]	0.111*** [0.009]	0.068*** [0.009]	0.077*** [0.009]	0.057*** [0.010]	0.067*** [0.009]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.017 [0.011]	0.02 [0.011]	0.014 [0.012]	0.018 [0.012]	0.01 [0.012]	0.014 [0.012]
3.Real Assets			0.026 [0.017]	0.032 [0.016]	0.026 [0.018]	0.032 [0.017]	0.019 [0.018]	0.026 [0.018]
4.Real Assets			0.082*** [0.016]	0.086*** [0.016]	0.061*** [0.017]	0.065*** [0.017]	0.050** [0.017]	0.056** [0.017]
5.Real Assets			0.210*** [0.016]	0.213*** [0.016]	0.171*** [0.017]	0.175*** [0.017]	0.158*** [0.018]	0.164*** [0.017]
IHS of ppp-adjusted household income			0.046*** [0.003]	0.042*** [0.003]	0.038*** [0.003]	0.034*** [0.003]	0.036*** [0.003]	0.032*** [0.003]
Home ownership			0.011 [0.014]	0.006 [0.014]	0.019 [0.014]	0.013 [0.014]	0.021 [0.015]	0.014 [0.014]
Health (ADL limitations)			-0.012** [0.004]	-0.009* [0.004]	-0.011* [0.005]	-0.008 [0.005]	-0.006 [0.005]	-0.004 [0.005]
Female			-0.016* [0.007]	-0.016* [0.007]	0.015 [0.008]	0.015 [0.008]	0.013 [0.008]	0.013 [0.008]
Partner in HH			0.037*** [0.010]	0.036*** [0.010]	0.023* [0.011]	0.021* [0.011]	0.016 [0.011]	0.015 [0.011]
Age			0.001* [0.000]	0.001* [0.000]	0.002*** [0.000]	0.002*** [0.000]	0.003*** [0.000]	0.002*** [0.000]
HH size			0.003	0.004	0.005	0.006	0.005	0.006

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
			[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
Number of Children			-0.015*** [0.002]	-0.015*** [0.002]	-0.017*** [0.003]	-0.017*** [0.003]	-0.018*** [0.003]	-0.018*** [0.003]
Trusting other people							0.005** [0.002]	0.005** [0.002]
Control							-0.004 [0.009]	-0.013 [0.009]
Life is full of opportunities							0.021 [0.011]	0.021 [0.011]
Future looks good							0.036** [0.011]	0.033** [0.011]
Volunteering							0.046*** [0.009]	0.049*** [0.009]
Religious organization							0.025* [0.012]	0.021 [0.011]
Prayer								
1b.Never							0 [.]	0 [.]
2. Sometimes							0.019* [0.010]	0.018 [0.009]
3. Frequently							-0.02 [0.011]	-0.02 [0.011]
AT	-0.255*** [0.033]		-0.197*** [0.031]		-0.213*** [0.033]		-0.220*** [0.033]	
CH	0.014		0.001		-0.025		-0.035	

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
	[0.034]		[0.032]		[0.034]		[0.034]	
IT_N	-0.021 [0.040]		0.024 [0.037]		0.01 [0.040]		0.024 [0.040]	
NL	-0.168*** [0.034]		-0.148*** [0.031]		-0.167*** [0.034]		-0.180*** [0.034]	
FR_E	-0.155*** [0.035]		-0.129*** [0.032]		-0.162*** [0.040]		-0.168*** [0.041]	
BE	-0.090** [0.034]		-0.077* [0.031]		-0.092** [0.033]		-0.094** [0.034]	
l_DE_at		-0.255*** [0.033]		-0.199*** [0.031]		-0.215*** [0.033]		-0.219*** [0.033]
l_DE_ch		0.066 [0.035]		0.048 [0.032]		0.021 [0.034]		0.013 [0.035]
l_IT_it		-0.021 [0.040]		0.023 [0.037]		0.009 [0.040]		0.022 [0.040]
l_IT_ch		-0.205*** [0.052]		-0.171** [0.054]		-0.144* [0.057]		-0.163** [0.057]
l_FR_fr		-0.155*** [0.035]		-0.130*** [0.032]		-0.165*** [0.040]		-0.172*** [0.041]
l_FR_ch		-0.097** [0.037]		-0.102** [0.035]		-0.137*** [0.037]		-0.142*** [0.037]
l_FR_be		-0.165*** [0.034]		-0.130*** [0.032]		-0.141*** [0.034]		-0.140*** [0.034]
l_Du_nl		-0.168*** [0.034]		-0.147*** [0.032]		-0.165*** [0.034]		-0.177*** [0.034]
l_FL_be		-0.01		-0.024		-0.043		-0.049

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
		[0.035]		[0.032]		[0.034]		[0.035]
_cons	0.399*** [0.033]	0.399*** [0.033]	-0.344*** [0.053]	-0.284*** [0.053]	-0.387*** [0.058]	-0.329*** [0.058]	-0.447*** [0.060]	-0.381*** [0.060]
N	13875	13875	13637	13637	11259	11259	10914	10914
r2	0.047	0.062	0.172	0.181	0.229	0.237	0.234	0.242

Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 12 shows that – in addition to the main findings reported in the paper – other significant predictors of holding risky assets plus IRA are having post-secondary education (however now Numeracy scores play no role), belonging to 2<sup>nd</sup>, 4<sup>th</sup> or 5<sup>th</sup> quintiles of real assets distribution, high income, home-ownership, and especially being younger and having less children.

Table 12: OLS. Risky Assets plus IRA, 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.218*** [0.010]	0.216*** [0.010]	0.212*** [0.011]	0.211*** [0.010]
Low risk aversion					0.217*** [0.020]	0.220*** [0.020]	0.210*** [0.020]	0.213*** [0.020]
Rightist					0.003 [0.002]	0.002 [0.002]	0.002 [0.002]	0.002 [0.002]
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			0 [0.020]	-0.001 [0.020]	-0.007 [0.025]	-0.009 [0.025]	-0.015 [0.027]	-0.015 [0.027]
3.Numeracy			0.026 [0.019]	0.028 [0.019]	0.011 [0.024]	0.012 [0.024]	0.001 [0.026]	0.003 [0.026]
4.Numeracy			0.062** [0.019]	0.061** [0.019]	0.038 [0.024]	0.036 [0.024]	0.021 [0.026]	0.021 [0.026]
5.Numeracy			0.104*** [0.020]	0.096*** [0.020]	0.073** [0.025]	0.065** [0.025]	0.054* [0.027]	0.049 [0.027]
Post-Secondary Education			0.120*** [0.009]	0.131*** [0.009]	0.087*** [0.010]	0.098*** [0.010]	0.074*** [0.010]	0.086*** [0.010]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.044*** [0.013]	0.049*** [0.013]	0.042** [0.014]	0.047*** [0.014]	0.038** [0.014]	0.043** [0.014]
3.Real Assets			0.03 [0.018]	0.038* [0.018]	0.029 [0.019]	0.038* [0.019]	0.024 [0.019]	0.032 [0.019]
4.Real Assets			0.096*** [0.017]	0.102*** [0.017]	0.079*** [0.018]	0.085*** [0.018]	0.069*** [0.018]	0.076*** [0.018]
5.Real Assets			0.191*** [0.017]	0.196*** [0.017]	0.155*** [0.018]	0.160*** [0.018]	0.143*** [0.018]	0.150*** [0.018]
IHS of ppp-adjusted household income			0.054*** [0.003]	0.047*** [0.003]	0.045*** [0.004]	0.039*** [0.004]	0.043*** [0.004]	0.038*** [0.004]
Home ownership			0.035* [0.015]	0.029* [0.015]	0.039* [0.015]	0.032* [0.015]	0.041** [0.015]	0.034* [0.015]
Health (ADL limitations)			-0.014** [0.004]	-0.010* [0.004]	-0.011* [0.005]	-0.007 [0.005]	-0.007 [0.006]	-0.004 [0.006]
Female			-0.018* [0.008]	-0.018* [0.008]	0.004 [0.008]	0.004 [0.008]	0.002 [0.009]	0.002 [0.009]
Partner in HH			0.034** [0.010]	0.032** [0.010]	0.019 [0.011]	0.017 [0.011]	0.012 [0.011]	0.011 [0.011]
Age			-0.005*** [0.000]	-0.006*** [0.000]	-0.005*** [0.000]	-0.005*** [0.000]	-0.005*** [0.000]	-0.005*** [0.000]
HH size			0.004 [0.005]	0.006 [0.005]	0.007 [0.006]	0.008 [0.006]	0.007 [0.006]	0.008 [0.006]



Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Number of Children			-0.017*** [0.003]	-0.017*** [0.002]	-0.016*** [0.003]	-0.016*** [0.003]	-0.017*** [0.003]	-0.016*** [0.003]
Trusting other people							0.007*** [0.002]	0.006** [0.002]
Control							0.009 [0.009]	-0.002 [0.009]
Life is full of opportunities							0.02 [0.013]	0.02 [0.013]
Future looks good							0.035** [0.013]	0.030* [0.012]
Volunteering							0.039*** [0.010]	0.043*** [0.009]
Religious organization							0.035** [0.012]	0.029* [0.012]
Prayer								
1b.Never							0 [.]	0 [.]
2. Sometimes							0.018 [0.010]	0.017 [0.010]
3. Frequently							-0.033** [0.011]	-0.032** [0.011]
AT	-0.208*** [0.034]		-0.166*** [0.031]		-0.177*** [0.034]		-0.191*** [0.034]	
CH	0.129*** [0.035]		0.095** [0.032]		0.079* [0.035]		0.063 [0.035]	

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
IT_N	-0.032 [0.040]		-0.004 [0.037]		-0.008 [0.041]		0.005 [0.041]	
NL	-0.147*** [0.035]		-0.141*** [0.032]		-0.155*** [0.035]		-0.175*** [0.035]	
FR_E	0.067 [0.036]		0.085** [0.033]		-0.01 [0.044]		-0.008 [0.045]	
BE	0.055 [0.035]		0.046 [0.031]		0.038 [0.034]		0.033 [0.035]	
l_DE_at		-0.208*** [0.034]		-0.168*** [0.031]		-0.180*** [0.034]		-0.191*** [0.034]
l_DE_ch		0.191*** [0.035]		0.154*** [0.032]		0.135*** [0.035]		0.121*** [0.036]
l_IT_it		-0.032 [0.040]		-0.006 [0.037]		-0.009 [0.041]		0.002 [0.041]
l_IT_ch		-0.182*** [0.055]		-0.159** [0.057]		-0.124* [0.059]		-0.135* [0.060]
l_FR_fr		0.067 [0.036]		0.084* [0.033]		-0.014 [0.044]		-0.012 [0.045]
l_FR_ch		-0.002 [0.039]		-0.029 [0.035]		-0.049 [0.038]		-0.056 [0.039]
l_FR_be		-0.032 [0.035]		-0.018 [0.032]		-0.027 [0.035]		-0.031 [0.036]
l_Du_nl		-0.147*** [0.035]		-0.140*** [0.032]		-0.153*** [0.035]		-0.171*** [0.035]
l_FL_be		0.147*** [0.036]		0.111*** [0.032]		0.105** [0.035]		0.096** [0.036]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
_cons	0.419*** [0.034]	0.419*** [0.034]	0.007 [0.059]	0.084 [0.059]	0.045 [0.065]	0.124 [0.065]	-0.006 [0.068]	0.084 [0.067]
N	13871	13871	13639	13639	11260	11260	10923	10923
r2	0.075	0.092	0.227	0.238	0.266	0.277	0.27	0.281

Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

APPENDIX III

**Standard Errors clustered by Linguistic communities**

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Model 1	Only Country/Language Interactions Dummies
Model 2	Country/Language Interactions Dummies + Objective Characteristics
Model 3	Country/Language Interactions Dummies + Objective Characteristics + Subjective preferences
Model 4	Country/Language Interactions Dummies + Objective Characteristics + Subjective preferences + Social/Cultural Characteristics

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Table 1: LPM. OLS. Pure Stocks-Holding (direct and indirect), 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.176*** [0.018]	0.175*** [0.017]	0.173*** [0.019]	0.173*** [0.017]
Low risk aversion					0.285*** [0.025]	0.287*** [0.031]	0.281*** [0.027]	0.283*** [0.034]
Rightist					0.006 [0.003]	0.005* [0.002]	0.006* [0.002]	0.005* [0.002]
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			-0.008 [0.013]	-0.008 [0.013]	-0.01 [0.025]	-0.011 [0.024]	-0.009 [0.024]	-0.009 [0.022]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
3.Numeracy			-0.001 [0.013]	-0.001 [0.014]	-0.005 [0.024]	-0.005 [0.022]	-0.005 [0.021]	-0.004 [0.019]
4.Numeracy			0.025 [0.015]	0.025 [0.016]	0.016 [0.024]	0.015 [0.022]	0.013 [0.022]	0.014 [0.020]
5.Numeracy			0.082* [0.031]	0.078* [0.027]	0.066 [0.039]	0.062 [0.033]	0.063 [0.034]	0.06 [0.028]
Post- Secondary Education			0.074*** [0.010]	0.081*** [0.011]	0.048*** [0.008]	0.056*** [0.009]	0.040** [0.008]	0.048*** [0.009]
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.008 [0.006]	0.011 [0.006]	0.004 [0.009]	0.007 [0.008]	0.002 [0.009]	0.005 [0.008]
3.Real Assets			0.018 [0.010]	0.023* [0.010]	0.019 [0.010]	0.024* [0.010]	0.016 [0.010]	0.021 [0.010]
4.Real Assets			0.062** [0.010]	0.063*** [0.010]	0.044** [0.011]	0.047** [0.012]	0.036* [0.012]	0.039* [0.014]
5.Real Assets			0.170*** [0.017]	0.171*** [0.013]	0.139*** [0.014]	0.140*** [0.012]	0.130*** [0.015]	0.133*** [0.014]
IHS of ppp- adjusted household income			0.030*** [0.002]	0.026*** [0.003]	0.024*** [0.003]	0.020*** [0.003]	0.023*** [0.003]	0.019*** [0.003]
Home Ownership			-0.005 [0.017]	-0.008 [0.016]	-0.002 [0.016]	-0.006 [0.015]	0 [0.013]	-0.004 [0.013]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Health (ADL limitations)			-0.005 [0.003]	-0.003 [0.004]	-0.007 [0.003]	-0.004 [0.004]	-0.003 [0.002]	-0.001 [0.004]
Female			-0.026* [0.007]	-0.026** [0.007]	0.003 [0.008]	0.003 [0.008]	0 [0.007]	0 [0.007]
Partner in HH			0.021** [0.005]	0.020** [0.005]	0.012 [0.008]	0.011 [0.007]	0.006 [0.008]	0.006 [0.006]
Age			0 [0.001]	-0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]
HH size			0.01 [0.005]	0.011 [0.005]	0.01 [0.005]	0.011 [0.005]	0.01 [0.005]	0.01 [0.006]
Number of Children			-0.007* [0.002]	-0.007** [0.002]	-0.008* [0.003]	-0.008** [0.002]	-0.009* [0.003]	-0.009* [0.003]
Trusting other people							0.005* [0.002]	0.004* [0.002]
Control							0.002 [0.003]	-0.005 [0.008]
Life is full of opportunities							0.007 [0.011]	0.006 [0.011]
Future looks good							0.021* [0.006]	0.017 [0.010]
Volunteering							0.020* [0.006]	0.022 [0.010]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Religious organization							[0.008]	[0.012]
Prayer							0.021	0.017
1b.Never							[0.013]	[0.011]
2. Sometimes							0	0
3. Frequently							[.]	[.]
AT	-0.151*** [0.000]		-0.105*** [0.007]		-0.113*** [0.009]		-0.120*** [0.006]	
CH	0.040*** [0.000]		0.032*** [0.004]		0.021*** [0.002]		0.014** [0.003]	
IT_N	-0.107*** [0.000]		-0.071*** [0.004]		-0.084*** [0.004]		-0.076*** [0.004]	
NL	-0.047*** [0.000]		-0.028*** [0.003]		-0.037*** [0.002]		-0.045*** [0.002]	
FR_E	-0.036*** [0.000]		-0.014* [0.004]		-0.007 [0.007]		-0.005 [0.008]	
BE	-0.020*** [0.000]		-0.008 [0.005]		-0.014* [0.004]		-0.012* [0.004]	
l_DE_at		-0.151*** [0.000]		-0.107*** [0.007]		-0.115*** [0.008]		-0.120*** [0.006]
l_DE_ch		0.072***		0.062***		0.052***		0.048***

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
		[0.000]		[0.004]		[0.003]		[0.004]
l_IT_it		-0.107*** [0.000]		-0.071*** [0.004]		-0.085*** [0.004]		-0.078*** [0.004]
l_IT_ch		-0.106*** [0.000]		-0.083*** [0.004]		-0.058*** [0.008]		-0.063*** [0.006]
l_FR_fr		-0.036*** [0.000]		-0.014** [0.004]		-0.009 [0.006]		-0.007 [0.007]
l_FR_ch		-0.027*** [0.000]		-0.028*** [0.005]		-0.053*** [0.004]		-0.057*** [0.003]
l_FR_be		-0.088*** [0.000]		-0.060*** [0.005]		-0.067*** [0.006]		-0.063*** [0.006]
l_Du_nl		-0.047*** [0.000]		-0.026*** [0.003]		-0.036*** [0.003]		-0.042*** [0.003]
l_FL_be		0.052*** [0.000]		0.047*** [0.004]		0.042*** [0.003]		0.041*** [0.003]
_cons	0.231*** [0.000]	0.231*** [0.000]	-0.204* [0.078]	-0.152 [0.068]	-0.27 [0.115]	-0.215 [0.098]	-0.319* [0.124]	-0.256* [0.105]
N	13749	13749	13516	13516	11178	11178	10842	10842
r2	0.032	0.044	0.13	0.137	0.18	0.188	0.182	0.189

Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001



Table 2: Graphical illustration for influence of the 4 Models on country (the upper plot) in each panel and linguistic communities' dummies (the lower plot), as deviations from South Germany and German-speakers in South Germany (respectively).

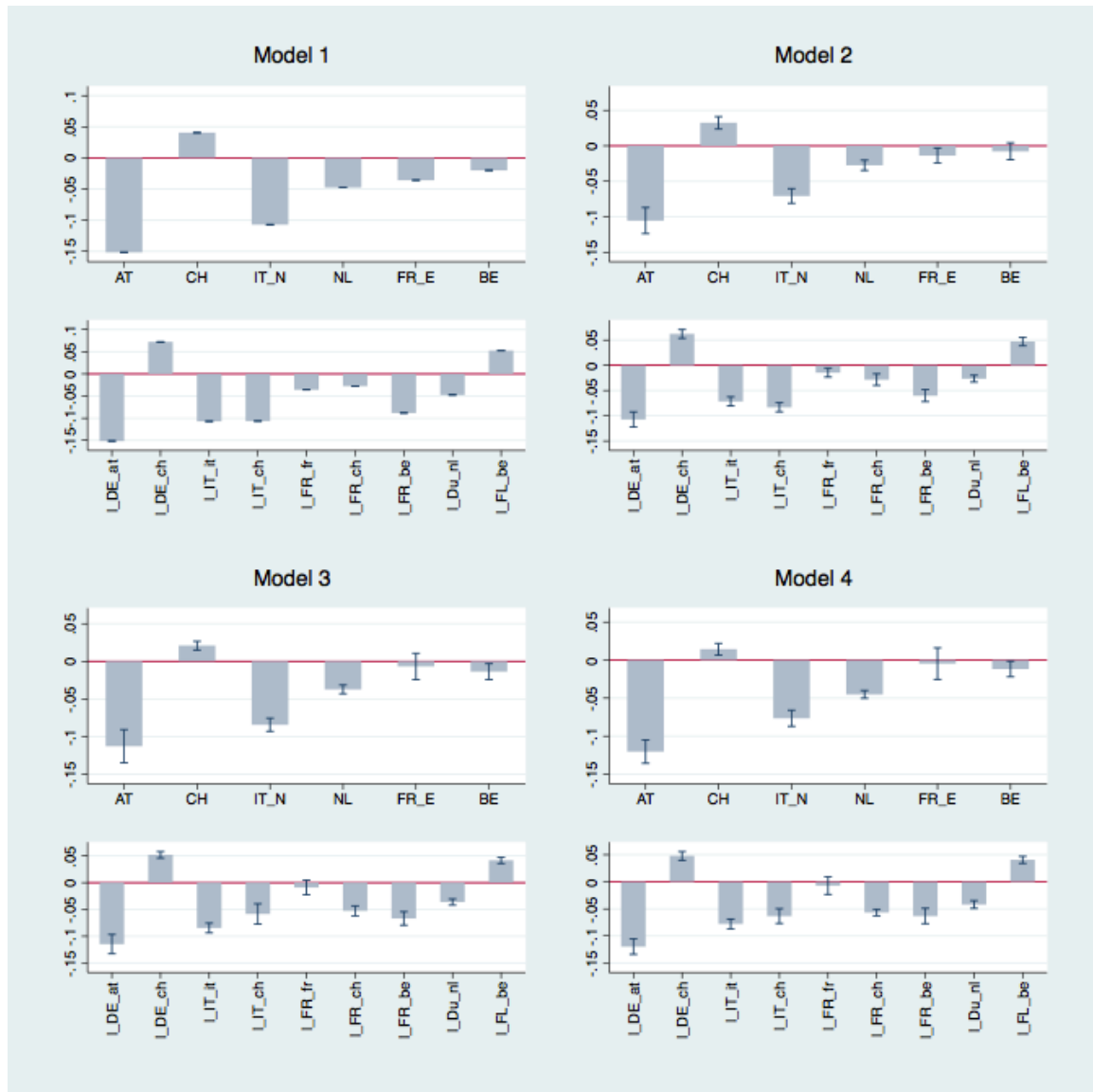


Table 3: OLS. Risky Assets (holding of stocks and bonds and/or mutual funds), 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.239*** [0.015]	0.238*** [0.014]	0.234*** [0.015]	0.234*** [0.014]
Low risk aversion					0.293*** [0.025]	0.296*** [0.030]	0.288*** [0.026]	0.292*** [0.031]
Rightist					0.004 [0.003]	0.003 [0.002]	0.004 [0.002]	0.003 [0.002]
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			-0.005 [0.018]	-0.006 [0.016]	-0.013 [0.029]	-0.013 [0.027]	-0.021 [0.029]	-0.02 [0.028]
3.Numeracy			0.026 [0.015]	0.027 [0.019]	0.019 [0.025]	0.021 [0.026]	0.011 [0.022]	0.013 [0.023]
4.Numeracy			0.052* [0.019]	0.052* [0.021]	0.038 [0.027]	0.037 [0.028]	0.023 [0.024]	0.023 [0.026]
5.Numeracy			0.111** [0.028]	0.105** [0.023]	0.087* [0.035]	0.081* [0.029]	0.071* [0.027]	0.066* [0.022]
Post-Secondary Education			0.103*** [0.007]	0.111*** [0.008]	0.068*** [0.007]	0.077*** [0.006]	0.057*** [0.007]	0.067*** [0.006]
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.017 [0.010]	0.02 [0.011]	0.014 [0.012]	0.018 [0.012]	0.01 [0.012]	0.014 [0.013]
3.Real Assets			0.026	0.032	0.026	0.032	0.019	0.026

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
			[0.023]	[0.019]	[0.024]	[0.020]	[0.022]	[0.019]
4.Real Assets			0.082*** [0.011]	0.086*** [0.015]	0.061*** [0.009]	0.065** [0.017]	0.050** [0.010]	0.056* [0.019]
5.Real Assets			0.210*** [0.020]	0.213*** [0.016]	0.171*** [0.016]	0.175*** [0.015]	0.158*** [0.016]	0.164*** [0.016]
IHS of ppp- adjusted household income			0.046*** [0.002]	0.042*** [0.005]	0.038*** [0.002]	0.034*** [0.004]	0.036*** [0.003]	0.032*** [0.004]
Home ownership			0.011 [0.023]	0.006 [0.021]	0.019 [0.021]	0.013 [0.019]	0.021 [0.017]	0.014 [0.016]
Health (ADL limitations)			-0.012* [0.004]	-0.009* [0.004]	-0.011* [0.003]	-0.008 [0.004]	-0.006 [0.004]	-0.004 [0.003]
Female			-0.016 [0.009]	-0.016 [0.008]	0.015 [0.010]	0.015 [0.009]	0.013 [0.010]	0.013 [0.009]
Partner in HH			0.037** [0.008]	0.036** [0.009]	0.023* [0.007]	0.021 [0.009]	0.016 [0.008]	0.015 [0.010]
Age			0.001 [0.001]	0.001 [0.001]	0.002* [0.001]	0.002* [0.001]	0.003* [0.001]	0.002* [0.001]
HH size			0.003 [0.006]	0.004 [0.006]	0.005 [0.005]	0.006 [0.006]	0.005 [0.005]	0.006 [0.006]
Number of Children			-0.015*** [0.002]	-0.015*** [0.002]	-0.017*** [0.003]	-0.017*** [0.003]	-0.018** [0.003]	-0.018*** [0.003]
Trusting other people							0.005 [0.002]	0.005 [0.002]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Control							-0.004 [0.010]	-0.013* [0.005]
Life is full of opportunities							0.021 [0.010]	0.021 [0.011]
Future looks good							0.036* [0.011]	0.033* [0.012]
Volunteering							0.046* [0.013]	0.049** [0.014]
Religious organization							0.025*** [0.004]	0.021** [0.005]
Prayer								
1b.Never							0 [.]	0 [.]
2. Sometimes							0.019 [0.019]	0.018 [0.018]
3. Frequently							-0.02 [0.012]	-0.02 [0.011]
AT	-0.255*** [0.000]		-0.197*** [0.007]		-0.213*** [0.008]		-0.220*** [0.005]	
CH	0.014*** [0.000]		0.001 [0.004]		-0.025*** [0.003]		-0.035*** [0.003]	
IT_N	-0.021*** [0.000]		0.024** [0.004]		0.010** [0.002]		0.024*** [0.004]	
NL	-0.168*** [0.000]		-0.148*** [0.003]		-0.167*** [0.003]		-0.180*** [0.003]	

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
FR_E	-0.155*** [0.000]		-0.129*** [0.004]		-0.162*** [0.010]		-0.168*** [0.012]	
BE	-0.090*** [0.000]		-0.077*** [0.005]		-0.092*** [0.004]		-0.094*** [0.005]	
l_DE_at		-0.255*** [0.000]		-0.199*** [0.005]		-0.215*** [0.007]		-0.219*** [0.004]
l_DE_ch		0.066*** [0.000]		0.048*** [0.005]		0.021*** [0.004]		0.013* [0.004]
l_IT_it		-0.021*** [0.000]		0.023*** [0.004]		0.009* [0.003]		0.022*** [0.004]
l_IT_ch		-0.205*** [0.000]		-0.171*** [0.004]		-0.144*** [0.006]		-0.163*** [0.004]
l_FR_fr		-0.155*** [0.000]		-0.130*** [0.003]		-0.165*** [0.008]		-0.172*** [0.010]
l_FR_ch		-0.097*** [0.000]		-0.102*** [0.006]		-0.137*** [0.005]		-0.142*** [0.003]
l_FR_be		-0.165*** [0.000]		-0.130*** [0.005]		-0.141*** [0.004]		-0.140*** [0.006]
l_Du_nl		-0.168*** [0.000]		-0.147*** [0.003]		-0.165*** [0.003]		-0.177*** [0.005]
l_FL_be		-0.010*** [0.000]		-0.024*** [0.004]		-0.043*** [0.002]		-0.049*** [0.003]
_cons	0.399*** [0.000]	0.399*** [0.000]	-0.344** [0.085]	-0.284** [0.073]	-0.387* [0.109]	-0.329** [0.087]	-0.447* [0.128]	-0.381** [0.104]
N	13875	13875	13637	13637	11259	11259	10914	10914
r2	0.047	0.062	0.172	0.181	0.229	0.237	0.234	0.242

Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 4: Graphical illustration for influence of the 4 Models on country (the upper plot) in each panel and linguistic communities' dummies (the lower plot), as deviations from South Germany and German-speakers in South Germany (respectively).

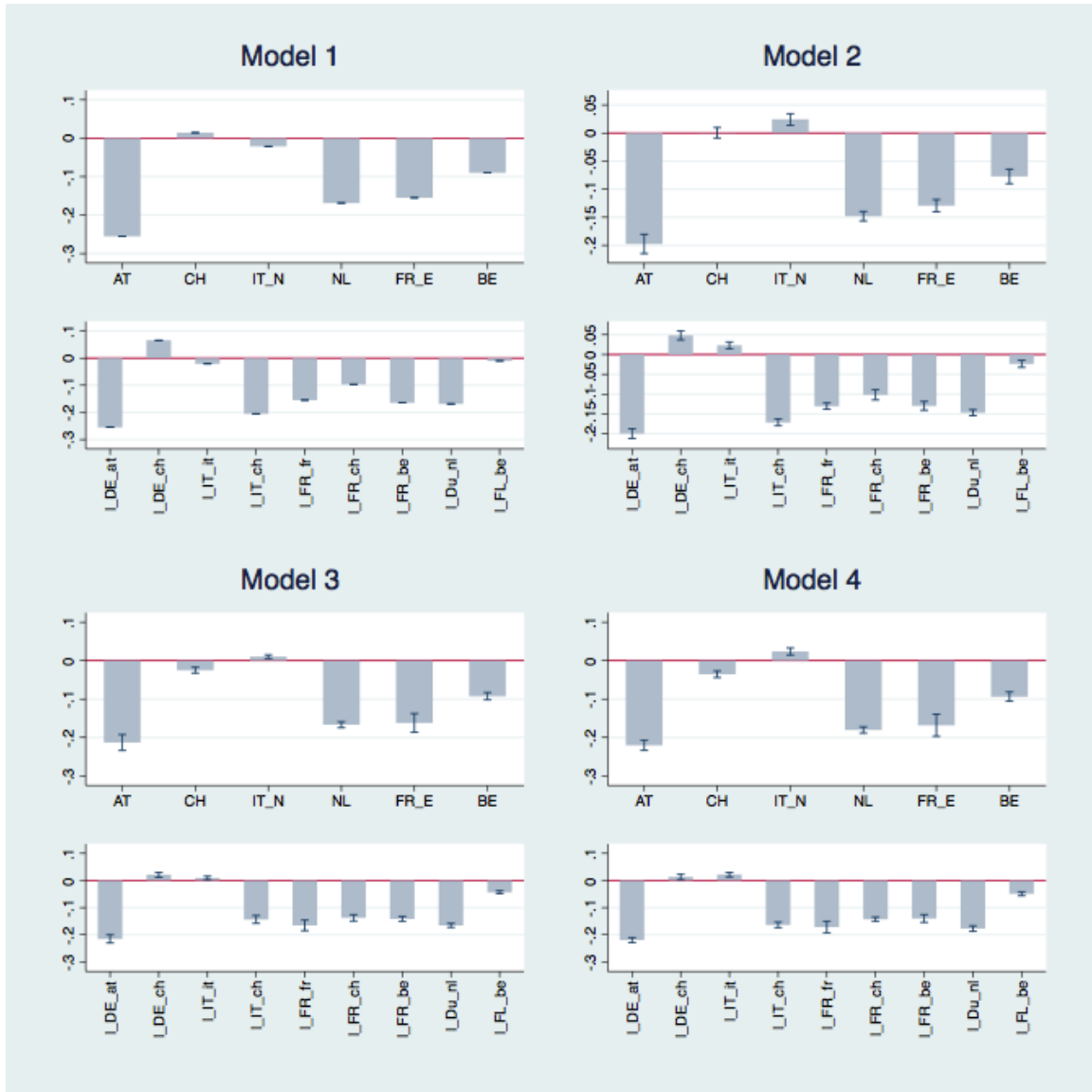


Table 5: OLS. Risky Assets plus IRA, 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.218*** [0.010]	0.216*** [0.012]	0.212*** [0.011]	0.211*** [0.014]
Low risk aversion					0.217** [0.039]	0.220*** [0.034]	0.210** [0.036]	0.213*** [0.033]
Rightist					0.003* [0.001]	0.002 [0.001]	0.002* [0.001]	0.002 [0.001]
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			0 [0.015]	-0.001 [0.017]	-0.007 [0.020]	-0.009 [0.023]	-0.015 [0.019]	-0.015 [0.024]
3.Numeracy			0.026 [0.022]	0.028 [0.025]	0.011 [0.020]	0.012 [0.022]	0.001 [0.017]	0.003 [0.022]
4.Numeracy			0.062 [0.029]	0.061 [0.032]	0.038 [0.028]	0.036 [0.029]	0.021 [0.022]	0.021 [0.027]
5.Numeracy			0.104* [0.031]	0.096** [0.027]	0.073* [0.030]	0.065* [0.024]	0.054* [0.022]	0.049* [0.020]
Post-Secondary Education			0.120*** [0.012]	0.131*** [0.008]	0.087** [0.015]	0.098*** [0.011]	0.074** [0.017]	0.086*** [0.013]
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.044*** [0.004]	0.049*** [0.008]	0.042*** [0.006]	0.047*** [0.008]	0.038*** [0.005]	0.043** [0.010]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
3.Real Assets			0.03 [0.018]	0.038 [0.027]	0.029 [0.016]	0.038 [0.030]	0.024 [0.015]	0.032 [0.031]
4.Real Assets			0.096** [0.025]	0.102** [0.030]	0.079* [0.025]	0.085* [0.032]	0.069* [0.027]	0.076 [0.034]
5.Real Assets			0.191** [0.038]	0.196*** [0.036]	0.155** [0.035]	0.160** [0.035]	0.143** [0.036]	0.150** [0.038]
IHS of ppp- adjusted household income			0.054*** [0.004]	0.047*** [0.004]	0.045*** [0.004]	0.039*** [0.003]	0.043*** [0.004]	0.038*** [0.003]
Home ownership			0.035 [0.038]	0.029 [0.038]	0.039 [0.036]	0.032 [0.038]	0.041 [0.033]	0.034 [0.036]
Health (ADL limitations)			-0.014* [0.004]	-0.010* [0.004]	-0.011 [0.005]	-0.007 [0.005]	-0.007 [0.009]	-0.004 [0.007]
Female			-0.018 [0.007]	-0.018* [0.007]	0.004 [0.007]	0.004 [0.007]	0.002 [0.006]	0.002 [0.006]
Partner in HH			0.034** [0.006]	0.032*** [0.007]	0.019* [0.006]	0.017 [0.009]	0.012 [0.007]	0.011 [0.010]
Age			-0.005* [0.002]	-0.006** [0.001]	-0.005* [0.001]	-0.005** [0.001]	-0.005* [0.002]	-0.005** [0.001]
HH size			0.004 [0.005]	0.006 [0.006]	0.007 [0.003]	0.008 [0.005]	0.007 [0.003]	0.008 [0.006]
Number of Children			-0.017** [0.003]	-0.017*** [0.003]	-0.016** [0.003]	-0.016*** [0.002]	-0.017** [0.003]	-0.016*** [0.003]
Trusting other people							0.007	0.006



Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Control							[0.003]	[0.003]
Life is full of opportunities							0.009 [0.013]	-0.002 [0.008]
Future looks good							0.02 [0.011]	0.02 [0.012]
Volunteering							0.035*** [0.004]	0.030* [0.013]
Religious organization							0.039* [0.012]	0.043** [0.013]
Prayer							0.035** [0.007]	0.029* [0.010]
1b.Never							0 [.]	0 [.]
2. Sometimes							0.018 [0.015]	0.017 [0.014]
3. Frequently							-0.033** [0.007]	-0.032* [0.011]
AT	-0.208*** [0.000]		-0.166*** [0.005]		-0.177*** [0.006]		-0.191*** [0.006]	
CH	0.129*** [0.000]		0.095*** [0.002]		0.079*** [0.003]		0.063*** [0.005]	
IT_N	-0.032*** [0.000]		-0.004 [0.004]		-0.008 [0.004]		0.005 [0.004]	
NL	-0.147*** [0.000]		-0.141*** [0.003]		-0.155*** [0.003]		-0.175*** [0.004]	

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
FR_E	0.067*** [0.000]		0.085*** [0.003]		-0.01 [0.008]		-0.008 [0.011]	
BE	0.055*** [0.000]		0.046*** [0.004]		0.038*** [0.002]		0.033*** [0.003]	
l_DE_at		-0.208*** [0.000]		-0.168*** [0.005]		-0.180*** [0.005]		-0.191*** [0.006]
l_DE_ch		0.191*** [0.000]		0.154*** [0.004]		0.135*** [0.004]		0.121*** [0.007]
l_IT_it		-0.032*** [0.000]		-0.006 [0.004]		-0.009* [0.004]		0.002 [0.003]
l_IT_ch		-0.182*** [0.000]		-0.159*** [0.004]		-0.124*** [0.006]		-0.135*** [0.006]
l_FR_fr		0.067*** [0.000]		0.084*** [0.002]		-0.014 [0.009]		-0.012 [0.010]
l_FR_ch		-0.002*** [0.000]		-0.029*** [0.006]		-0.049*** [0.006]		-0.056*** [0.005]
l_FR_be		-0.032*** [0.000]		-0.018** [0.004]		-0.027*** [0.004]		-0.031*** [0.004]
l_Du_nl		-0.147*** [0.000]		-0.140*** [0.003]		-0.153*** [0.004]		-0.171*** [0.007]
l_FL_be		0.147*** [0.000]		0.111*** [0.003]		0.105*** [0.003]		0.096*** [0.005]
_cons	0.419*** [0.000]	0.419*** [0.000]	0.007 [0.143]	0.084 [0.130]	0.045 [0.119]	0.124 [0.108]	-0.006 [0.137]	0.084 [0.122]
N	13871	13871	13639	13639	11260	11260	10923	10923
r2	0.075	0.092	0.227	0.238	0.266	0.277	0.27	0.281

Robust standard errors in brackets; \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 6: Graphical illustration for influence of the 4 Models on country (the upper plot) in each panel and linguistic communities' dummies (the lower plot), as deviations from South Germany and German-speakers in South Germany (respectively).

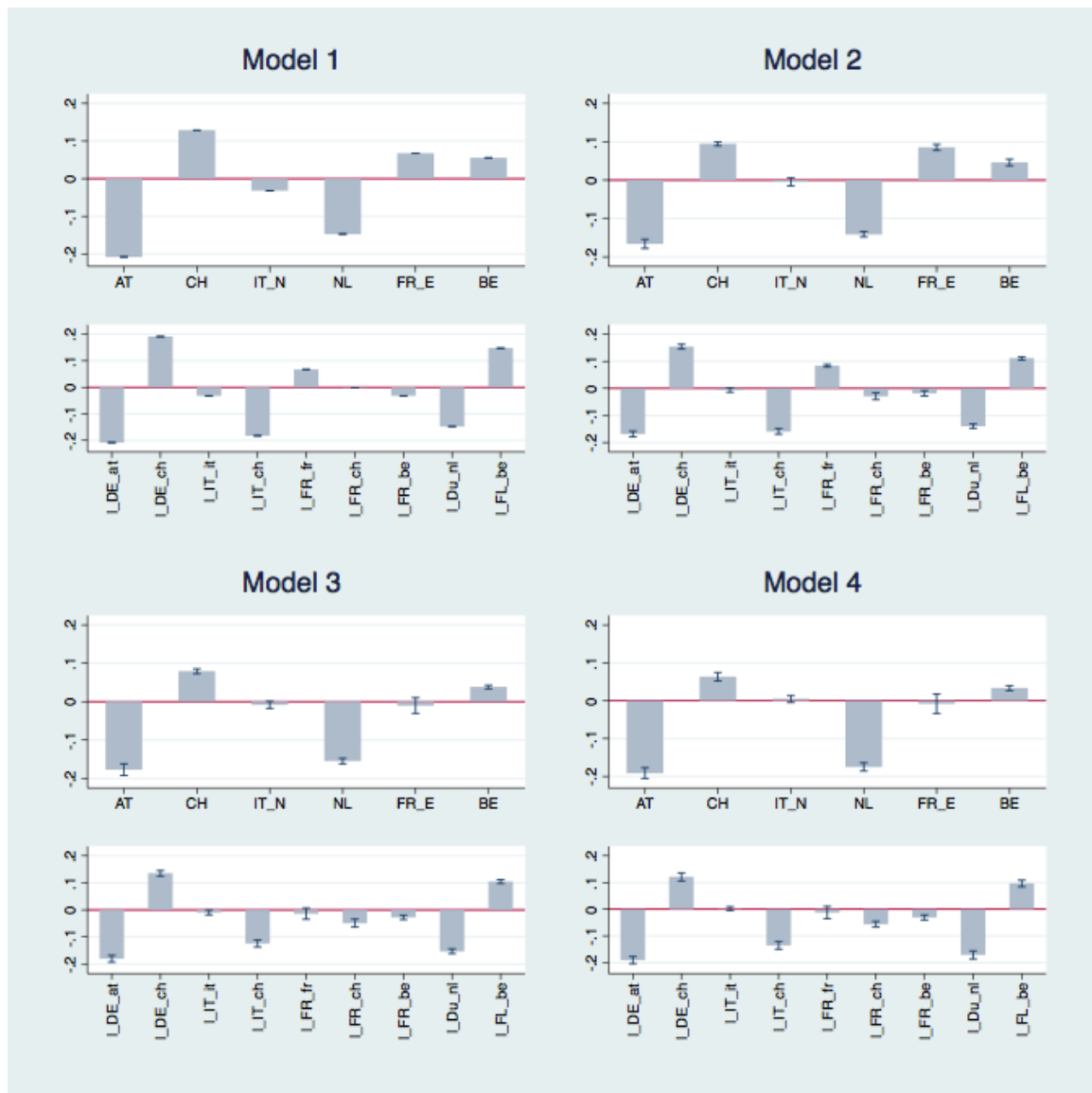


Table 7. Post-Estimation: Results of the F-Test for Equality of Language Interactions

Dummies

	Model 1	Model 2	Model 3	Model 4
F- Test	P-value	P-value	P-value	P-value
<b>Pure Stocks-Holding (direct and indirect)</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	N/A	0.0000	0.0000	0.0000
test (_b[l_IT_it] = _b[l_IT_ch])	N/A	0.0001	0.0004	0.0043
test (_b[l_DE_at] = _b[l_DE_ch]=0)	N/A	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	N/A	0.0000	0.0000	0.0000
<b>Risky Assets (holding of stocks and bonds and/or mutual funds)</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	N/A	0.0002	0.0085	0.0026
test (_b[l_IT_it] = _b[l_IT_ch])	N/A	0.0000	0.0000	0.0000
test (_b[l_DE_at] = _b[l_DE_ch]=0)	N/A	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	N/A	0.0000	0.0000	0.0000
<b>Risky Assets plus IRA</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	N/A	0.0000	0.0031	0.0000
test (_b[l_IT_it] = _b[l_IT_ch])	N/A	0.0000	0.0000	0.0000
test (_b[l_DE_at] = _b[l_DE_ch]=0)	N/A	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	N/A	0.0000	0.0000	0.0000

Table 8. F-Test for Equality of Language Groups in Switzerland and Belgium, Same table for all the three Outcomes: holding of Stocks, Risky Assets and Risky Assets plus IRA

	Model 1	Model 2	Model 3	Model 4
F- Test	<b>P-value</b>	<b>P-value</b>	<b>P-value</b>	<b>P-value</b>
test (_b[l_DE_ch] = _b[l_FR_ch]=_b[l_IT_ch])	N/A	0.0000	0.0000	0.0000
test (_b[l_FR_be] = _b[l_FL_be])	N/A	0.0000	0.0000	0.0000

APPENDIX IV

**Probit**

Model 1	Only Country/Language Interactions Dummies
Model 2	Country/Language Interactions Dummies + Objective Characteristics
Model 3	Country/Language Interactions Dummies + Objective Characteristics + Subjective preferences
Model 4	Country/Language Interactions Dummies + Objective Characteristics + Subjective preferences + Social/Cultural Characteristics

Table 8: Probit. Pure Stocks-Holding (direct and indirect), 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.650*** [0.034]	0.655*** [0.034]	0.641*** [0.034]	0.647*** [0.034]
Low risk aversion					0.956*** [0.061]	0.974*** [0.061]	0.947*** [0.062]	0.964*** [0.062]
Rightist					0.025*** [0.007]	0.023** [0.008]	0.025** [0.008]	0.024** [0.008]
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			0.093 [0.128]	0.094 [0.129]	0.062 [0.158]	0.06 [0.159]	0.065 [0.170]	0.066 [0.171]
3.Numeracy			0.166 [0.123]	0.17 [0.124]	0.102 [0.152]	0.104 [0.153]	0.101 [0.165]	0.108 [0.166]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
4.Numeracy			0.289* [0.122]	0.291* [0.123]	0.209 [0.152]	0.207 [0.153]	0.193 [0.164]	0.196 [0.165]
5.Numeracy			0.481*** [0.124]	0.471*** [0.125]	0.390* [0.153]	0.375* [0.154]	0.370* [0.165]	0.363* [0.166]
Post- Secondary Education			0.260*** [0.030]	0.293*** [0.030]	0.180*** [0.034]	0.216*** [0.034]	0.144*** [0.034]	0.180*** [0.035]
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.134* [0.056]	0.146** [0.056]	0.1 [0.061]	0.115 [0.061]	0.088 [0.062]	0.103 [0.062]
3.Real Assets			0.185** [0.069]	0.204** [0.069]	0.177* [0.074]	0.198** [0.074]	0.156* [0.075]	0.177* [0.075]
4.Real Assets			0.380*** [0.064]	0.394*** [0.064]	0.300*** [0.069]	0.318*** [0.069]	0.258*** [0.070]	0.277*** [0.070]
5.Real Assets			0.708*** [0.062]	0.720*** [0.062]	0.591*** [0.067]	0.607*** [0.067]	0.552*** [0.068]	0.571*** [0.068]
IHS of ppp- adjusted household income			0.201*** [0.023]	0.178*** [0.022]	0.157*** [0.024]	0.134*** [0.023]	0.151*** [0.024]	0.130*** [0.023]
Home Ownership			-0.015 [0.052]	-0.027 [0.052]	-0.003 [0.056]	-0.019 [0.057]	0.002 [0.057]	-0.013 [0.057]
Health (ADL)			-0.057* [0.023]	-0.044 [0.022]	-0.065* [0.024]	-0.049 [0.023]	-0.048 [0.024]	-0.035 [0.023]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
limitations)			[0.026]	[0.026]	[0.031]	[0.030]	[0.031]	[0.031]
Female			-0.116*** [0.028]	-0.115*** [0.028]	0.008 [0.032]	0.011 [0.032]	-0.003 [0.033]	0.001 [0.033]
Partner in HH			0.064 [0.040]	0.063 [0.040]	0.036 [0.045]	0.033 [0.045]	0.008 [0.045]	0.008 [0.045]
Age			-0.001 [0.002]	-0.002 [0.002]	0.004* [0.002]	0.004* [0.002]	0.005** [0.002]	0.005* [0.002]
HH size			0.032 [0.019]	0.037 [0.019]	0.038 [0.022]	0.042* [0.021]	0.039 [0.022]	0.042 [0.022]
Number of Children			-0.045*** [0.010]	-0.045*** [0.011]	-0.050*** [0.012]	-0.049*** [0.012]	-0.058*** [0.012]	-0.056*** [0.012]
Trusting other people							0.024*** [0.007]	0.020** [0.007]
Control							0.01 [0.036]	-0.021 [0.036]
Life is full of opportunities							0.097 [0.057]	0.097 [0.057]
Future looks good							0.123* [0.053]	0.109* [0.053]
Volunteering							0.085* [0.034]	0.095** [0.034]



Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Religious organization							0.094* [0.045]	0.073 [0.045]
Prayer								
1b.Never							0 [.]	0 [.]
2. Sometimes							0.088* [0.038]	0.083* [0.038]
3. Frequently							-0.058 [0.046]	-0.058 [0.046]
AT	-0.671*** [0.099]		-0.514*** [0.102]		-0.561*** [0.113]		-0.603*** [0.116]	
CH	0.127 [0.098]		0.106 [0.102]		0.083 [0.113]		0.042 [0.115]	
IT_N	-0.419*** [0.120]		-0.293* [0.126]		-0.363* [0.142]		-0.325* [0.143]	
NL	-0.166 [0.100]		-0.09 [0.103]		-0.127 [0.115]		-0.167 [0.117]	
FR_E	-0.123 [0.102]		-0.025 [0.105]		0.008 [0.141]		0.02 [0.146]	
BE	-0.067 [0.097]		-0.023 [0.100]		-0.037 [0.112]		-0.03 [0.114]	
l_DE_at		-0.671*** [0.099]		-0.520*** [0.101]		-0.568*** [0.113]		-0.599*** [0.115]
l_DE_ch		0.220* [0.099]		0.204* [0.103]		0.19 [0.115]		0.158 [0.116]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
l_IT_it		-0.419*** [0.120]		-0.295* [0.125]		-0.365** [0.141]		-0.330* [0.143]
l_IT_ch		-0.416* [0.189]		-0.306 [0.214]		-0.176 [0.221]		-0.206 [0.224]
l_FR_fr		-0.123 [0.102]		-0.028 [0.105]		-0.002 [0.141]		0.01 [0.145]
l_FR_ch		-0.093 [0.110]		-0.111 [0.115]		-0.202 [0.127]		-0.228 [0.129]
l_FR_be		-0.331** [0.101]		-0.233* [0.104]		-0.258* [0.116]		-0.239* [0.118]
l_Du_nl		-0.166 [0.100]		-0.085 [0.103]		-0.122 [0.115]		-0.156 [0.117]
l_FL_be		0.163 [0.099]		0.149 [0.103]		0.141 [0.115]		0.132 [0.117]
_cons	-0.734*** [0.094]	-0.734*** [0.094]	-3.634*** [0.325]	-3.366*** [0.322]	-3.741*** [0.358]	-3.465*** [0.354]	-4.048*** [0.368]	-3.745*** [0.365]
N	13749	13749	13516	13516	11178	11178	10842	10842
Pseudo R2	0.0365	0.0476	0.1491	0.1554	0.1939	0.2014	0.1968	0.2034

Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 10: Probit. Risky Assets (holding of stocks and bonds and/or mutual funds), 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.732*** [0.031]	0.737*** [0.032]	0.721*** [0.032]	0.726*** [0.032]
Low risk aversion					0.893*** [0.061]	0.912*** [0.061]	0.887*** [0.062]	0.905*** [0.062]
Rightist					0.012 [0.007]	0.01 [0.007]	0.011 [0.007]	0.01 [0.007]
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			0.112 [0.104]	0.114 [0.105]	0.042 [0.126]	0.04 [0.127]	-0.008 [0.133]	-0.007 [0.134]
3.Numeracy			0.274** [0.099]	0.282** [0.100]	0.194 [0.121]	0.201 [0.122]	0.139 [0.128]	0.149 [0.129]
4.Numeracy			0.364*** [0.099]	0.365*** [0.099]	0.264* [0.120]	0.260* [0.121]	0.183 [0.128]	0.184 [0.129]
5.Numeracy			0.533*** [0.101]	0.520*** [0.102]	0.418*** [0.122]	0.400** [0.123]	0.335** [0.130]	0.322* [0.131]
Post-Secondary Education			0.305*** [0.028]	0.337*** [0.028]	0.216*** [0.031]	0.248*** [0.031]	0.181*** [0.032]	0.213*** [0.032]
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.140** [0.049]	0.155** [0.049]	0.123* [0.054]	0.140** [0.054]	0.106 [0.055]	0.125* [0.055]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
3.Real Assets			0.183** [0.061]	0.207*** [0.062]	0.177** [0.066]	0.203** [0.067]	0.150* [0.067]	0.176** [0.068]
4.Real Assets			0.369*** [0.057]	0.391*** [0.058]	0.295*** [0.062]	0.319*** [0.062]	0.254*** [0.063]	0.281*** [0.063]
5.Real Assets			0.698*** [0.056]	0.721*** [0.056]	0.587*** [0.061]	0.614*** [0.061]	0.546*** [0.062]	0.576*** [0.062]
IHS of ppp- adjusted household income			0.253*** [0.018]	0.232*** [0.018]	0.208*** [0.019]	0.188*** [0.019]	0.199*** [0.019]	0.180*** [0.019]
Home ownership			0.049 [0.048]	0.032 [0.048]	0.077 [0.051]	0.056 [0.052]	0.082 [0.052]	0.062 [0.053]
Health (ADL limitations)			-0.074*** [0.022]	-0.063** [0.022]	-0.062* [0.026]	-0.048 [0.026]	-0.045 [0.028]	-0.036 [0.028]
Female			-0.054* [0.026]	-0.054* [0.026]	0.057 [0.029]	0.059* [0.030]	0.052 [0.031]	0.053 [0.031]
Partner in HH			0.087* [0.036]	0.086* [0.036]	0.05 [0.040]	0.047 [0.040]	0.027 [0.041]	0.026 [0.041]
Age			0.004** [0.001]	0.004** [0.001]	0.009*** [0.002]	0.009*** [0.002]	0.011*** [0.002]	0.010*** [0.002]
HH size			0.003 [0.018]	0.008 [0.018]	0.013 [0.020]	0.018 [0.020]	0.014 [0.020]	0.018 [0.020]
Number of Children			-0.066*** [0.010]	-0.067*** [0.010]	-0.075*** [0.011]	-0.075*** [0.011]	-0.082*** [0.011]	-0.082*** [0.011]
Trusting other people							0.019**	0.016*

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
							[0.007]	[0.007]
Control							-0.014 [0.032]	-0.045 [0.033]
Life is full of opportunities							0.118* [0.050]	0.117* [0.050]
Future looks good							0.161*** [0.047]	0.151** [0.047]
Volunteering							0.161*** [0.032]	0.173*** [0.032]
Religious organization							0.096* [0.042]	0.078 [0.042]
Prayer 1b.Never							0 [.]	0 [.]
2. Sometimes							0.081* [0.035]	0.077* [0.035]
3. Frequently							-0.067 [0.042]	-0.069 [0.042]
AT	-0.806*** [0.089]		-0.689*** [0.093]		-0.767*** [0.103]		-0.807*** [0.106]	
CH	0.037 [0.089]		-0.028 [0.094]		-0.092 [0.104]		-0.141 [0.106]	
IT_N	-0.055 [0.103]		0.132 [0.110]		0.086 [0.123]		0.127 [0.125]	
NL	-0.481*** [0.091]		-0.476*** [0.095]		-0.552*** [0.106]		-0.609*** [0.109]	

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
FR_E	-0.437*** [0.092]		-0.403*** [0.098]		-0.512*** [0.133]		-0.548*** [0.139]	
BE	-0.241** [0.088]		-0.246** [0.093]		-0.296** [0.103]		-0.307** [0.105]	
l_DE_at		-0.806*** [0.089]		-0.694*** [0.093]		-0.773*** [0.103]		-0.802*** [0.106]
l_DE_ch		0.167 [0.090]		0.106 [0.096]		0.044 [0.105]		0.005 [0.108]
l_IT_it		-0.055 [0.103]		0.126 [0.110]		0.08 [0.122]		0.119 [0.124]
l_IT_ch		-0.608*** [0.168]		-0.531** [0.196]		-0.412* [0.201]		-0.500* [0.206]
l_FR_fr		-0.437*** [0.092]		-0.407*** [0.097]		-0.523*** [0.133]		-0.558*** [0.139]
l_FR_ch		-0.262** [0.099]		-0.336** [0.106]		-0.451*** [0.116]		-0.482*** [0.119]
l_FR_be		-0.468*** [0.091]		-0.407*** [0.096]		-0.452*** [0.106]		-0.451*** [0.109]
l_Du_nl		-0.481*** [0.091]		-0.470*** [0.095]		-0.547*** [0.106]		-0.599*** [0.108]
l_FL_be		-0.026 [0.090]		-0.103 [0.095]		-0.158 [0.106]		-0.184 [0.108]
_cons	-0.256** [0.085]	-0.256** [0.085]	-4.086*** [0.260]	-3.843*** [0.260]	-4.037*** [0.287]	-3.794*** [0.286]	-4.274*** [0.296]	-4.009*** [0.296]
N	13875	13875	13637	13637	11259	11259	10914	10914
Pseudo R2	0.0416	0.0525	0.1645	0.1707	0.209	0.2156	0.2144	0.2205

Robust standard errors in brackets

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 12: Probit. Risky Assets plus IRA, 50+, HH's

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Average risk aversion					0.643*** [0.031]	0.646*** [0.031]	0.629*** [0.032]	0.633*** [0.032]
Low risk aversion					0.639*** [0.064]	0.659*** [0.064]	0.623*** [0.064]	0.642*** [0.064]
Rightist					0.007 [0.007]	0.004 [0.007]	0.006 [0.007]	0.004 [0.007]
1b.Numeracy			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Numeracy			0.103 [0.095]	0.099 [0.096]	0.077 [0.119]	0.071 [0.121]	0.025 [0.126]	0.025 [0.127]
3.Numeracy			0.205* [0.091]	0.209* [0.092]	0.15 [0.115]	0.153 [0.116]	0.084 [0.121]	0.093 [0.123]
4.Numeracy			0.311*** [0.090]	0.308*** [0.091]	0.236* [0.114]	0.230* [0.116]	0.149 [0.121]	0.15 [0.122]
5.Numeracy			0.434*** [0.092]	0.411*** [0.093]	0.345** [0.116]	0.320** [0.118]	0.252* [0.123]	0.236 [0.124]
Post-Secondary Education			0.344*** [0.027]	0.382*** [0.028]	0.260*** [0.030]	0.300*** [0.031]	0.222*** [0.031]	0.262*** [0.031]
1b.Real Assets			0 [.]	0 [.]	0 [.]	0 [.]	0 [.]	0 [.]
2.Real Assets			0.199*** [0.045]	0.216*** [0.045]	0.198*** [0.049]	0.218*** [0.050]	0.187*** [0.050]	0.208*** [0.051]

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
3.Real Assets			0.159** [0.057]	0.187** [0.058]	0.158* [0.062]	0.188** [0.063]	0.137* [0.063]	0.167** [0.064]
4.Real Assets			0.347*** [0.054]	0.370*** [0.054]	0.302*** [0.058]	0.325*** [0.059]	0.272*** [0.059]	0.297*** [0.060]
5.Real Assets			0.595*** [0.053]	0.620*** [0.054]	0.514*** [0.058]	0.541*** [0.058]	0.481*** [0.059]	0.511*** [0.059]
IHS of ppp- adjusted household income			0.218*** [0.019]	0.196*** [0.018]	0.187*** [0.020]	0.165*** [0.019]	0.179*** [0.020]	0.158*** [0.019]
Home ownership			0.110* [0.045]	0.092* [0.046]	0.129** [0.049]	0.109* [0.049]	0.131** [0.050]	0.112* [0.050]
Health (ADL limitations)			-0.070*** [0.021]	-0.058** [0.021]	-0.058* [0.026]	-0.041 [0.026]	-0.045 [0.027]	-0.032 [0.027]
Female			-0.067** [0.025]	-0.069** [0.025]	0.002 [0.028]	0.001 [0.028]	-0.004 [0.029]	-0.003 [0.029]
Partner in HH			0.087* [0.035]	0.084* [0.035]	0.05 [0.039]	0.047 [0.039]	0.033 [0.039]	0.033 [0.040]
Age			-0.017*** [0.001]	-0.018*** [0.001]	-0.017*** [0.002]	-0.018*** [0.002]	-0.017*** [0.002]	-0.018*** [0.002]
HH size			0.005 [0.017]	0.01 [0.017]	0.013 [0.019]	0.018 [0.019]	0.013 [0.020]	0.016 [0.020]
Number of Children			-0.061*** [0.009]	-0.063*** [0.009]	-0.060*** [0.010]	-0.060*** [0.011]	-0.063*** [0.011]	-0.063*** [0.011]
Trusting other people							0.023***	0.019**



Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
Control							[0.006]	[0.006]
Life is full of opportunities							0.029 [0.031]	-0.008 [0.031]
Future looks good							0.127** [0.044]	0.112* [0.044]
Volunteering							0.128*** [0.031]	0.143*** [0.031]
Religious organization							0.122** [0.041]	0.102* [0.041]
Prayer								
1b.Never							0 [.]	0 [.]
2. Sometimes							0.061 [0.033]	0.056 [0.034]
3. Frequently							-0.114** [0.040]	-0.115** [0.040]
AT	-0.598*** [0.089]		-0.533*** [0.093]		-0.592*** [0.103]		-0.647*** [0.105]	
CH	0.324*** [0.089]		0.267** [0.095]		0.230* [0.105]		0.174 [0.107]	
IT_N	-0.082 [0.103]		0.029 [0.111]		0.01 [0.123]		0.044 [0.125]	
NL	-0.403*** [0.091]		-0.447*** [0.096]		-0.506*** [0.107]		-0.578*** [0.109]	

Variables	Model 1		Model 2		Model 3		Model 4	
	(1) Count _Dum	(2) Lang* Country	(3) Count _Dum	(4) Lang* Country	(5) Count _Dum	(6) Lang* Country	(7) Count _Dum	(8) Lang* Country
FR_E	0.17 [0.092]		0.282** [0.097]		-0.027 [0.132]		-0.027 [0.136]	
BE	0.14 [0.088]		0.14 [0.093]		0.116 [0.104]		0.097 [0.105]	
l_DE_at		-0.598*** [0.089]		-0.540*** [0.093]		-0.601*** [0.104]		-0.642*** [0.105]
l_DE_ch		0.484*** [0.091]		0.439*** [0.097]		0.398*** [0.107]		0.350** [0.108]
l_IT_it		-0.082 [0.103]		0.022 [0.111]		0.005 [0.123]		0.035 [0.125]
l_IT_ch		-0.512** [0.164]		-0.521** [0.190]		-0.396* [0.197]		-0.435* [0.199]
l_FR_fr		0.17 [0.092]		0.277** [0.098]		-0.043 [0.132]		-0.043 [0.136]
l_FR_ch		-0.004 [0.099]		-0.09 [0.105]		-0.155 [0.116]		-0.185 [0.118]
l_FR_be		-0.082 [0.091]		-0.037 [0.096]		-0.071 [0.107]		-0.084 [0.108]
l_Du_nl		-0.403*** [0.091]		-0.442*** [0.096]		-0.500*** [0.107]		-0.566*** [0.108]
l_FL_be		0.372*** [0.091]		0.317*** [0.096]		0.307** [0.107]		0.275* [0.108]
_cons	-0.204* [0.086]	-0.204* [0.086]	-2.129*** [0.259]	-1.854*** [0.257]	-1.903*** [0.291]	-1.598*** [0.287]	-2.042*** [0.294]	-1.710*** [0.292]
N	13871	13871	13639	13639	11260	11260	10923	10923
r2	0.0582	0.0705	0.1943	0.203	0.2264	0.2357	0.2306	0.2391

Robust standard errors in brackets; \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 13. Post-Estimation: Results of the F-Test for Equality of Language Interactions Dummies

	Model 1	Model 2	Model 3	Model 4
F- Test	P-value	P-value	P-value	P-value
<b>Pure Stocks-Holding (direct and indirect)</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	0.0000	0.0014	0.0318	0.0511
test (_b[l_IT_it] = _b[l_IT_ch])	0.9884	0.9606	0.3770	0.5670
test (_b[l_DE_at] = _b[l_DE_ch]=0)	0.0000	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	0.0000	0.0000	0.0000	0.0000
<b>Risky Assets (holding of stocks and bonds and/or mutual funds)</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	0.0026	0.5184	0.7445	0.5614
test (_b[l_IT_it] = _b[l_IT_ch])	0.0004	0.0004	0.0096	0.0014
test (_b[l_DE_at] = _b[l_DE_ch]=0)	0.0000	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	0.0000	0.0000	0.0000	0.0000
<b>Risky Assets plus IRA</b>				
test (_b[l_FR_fr] = _b[l_FR_ch]=_b[l_FR_be])	0.0000	0.0000	0.3984	0.2789
test (_b[l_IT_it] = _b[l_IT_ch])	0.0045	0.0025	0.0303	0.0118
test (_b[l_DE_at] = _b[l_DE_ch]=0)	0.0000	0.0000	0.0000	0.0000
test (_b[l_Du_nl] = _b[l_FL_be])	0.0000	0.0000	0.0000	0.0000

**For all the Kinds of Financial Behavior, in Switzerland all the Linguistic Communities behave differently, as well as in Belgium**

Table 15. F-Test for Equality of Language Groups in Switzerland and Belgium, Same table for all the three Outcomes: holding of Stocks, Risky Assets and Risky Assets plus IRA

	Model 1	Model 2	Model 3	Model 4
F- Test	<b>P-value</b>	<b>P-value</b>	<b>P-value</b>	<b>P-value</b>
test (_b[l_DE_ch] = _b[l_FR_ch]=_b[l_IT_ch])	0.0000	0.0000	0.0000	0.0000
test (_b[l_FR_be] = _b[l_FL_be])	0.0000	0.0000	0.0000	0.0000