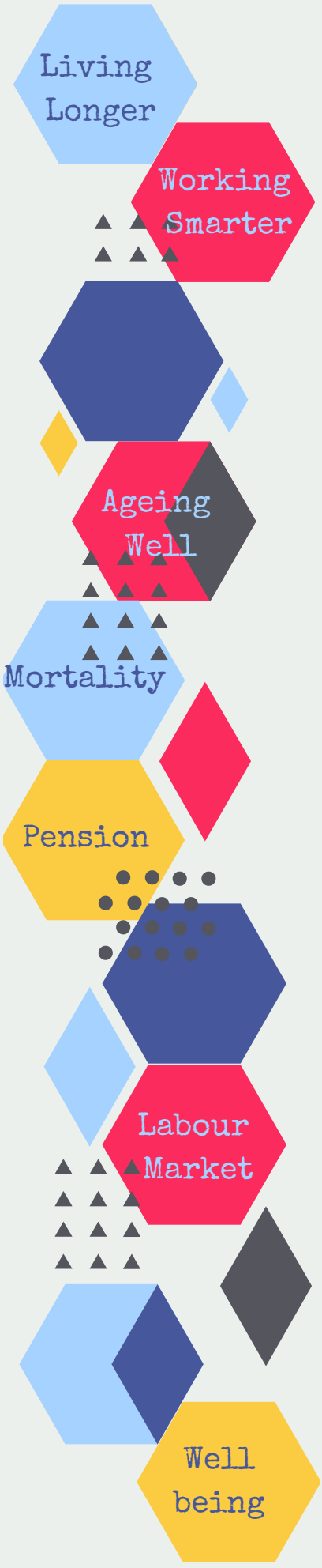
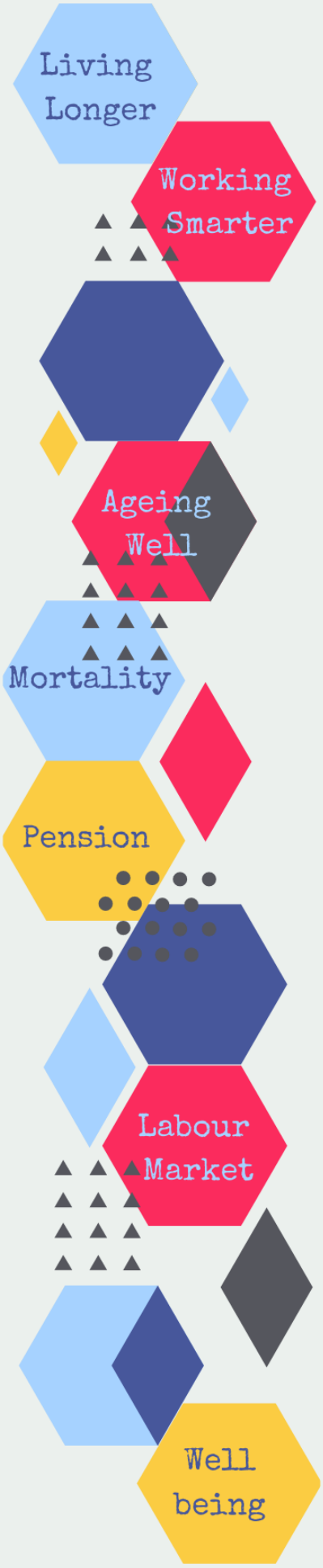


Living Longer, Working Smarter, Ageing Well Conference

Corvinus University of Budapest

May 18-19, 2020



Living Longer, Working Smarter, Ageing Well Conference

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	Monday				
	Start	End	Speaker	Session	Topic
Morning, Chair: Burka Dávid	10:00	10:10	Kovács Erzsébet	Opening	Welcome to the LiWoSA Conference
	10:10	10:50	Ronald Richman	Ageing, Mortality, Pension	Lee and Carter go Machine Learning: Recurrent Neural Networks
	10:55	11:25	Jan Gogola		Life Expectancy slowdown in V4 countries
	11:30	11:45	Vona Gábor		Releasing the Potential in Human Resource
	11:50	12:05	Medgyesi Márton		Time transfers between elderly parents and their children: Hungary in European context
	12:10	13:10	Lunch break		
Afternoon, Chair: Vaskövi Ágnes	13:10	13:40	Arkadiusz Wiśniowski	Labour Market	Measuring Migration Stocks Using Traditional and Social Media Data
	13:45	14:00	Juhász Péter	Well-being	Lifestyle medicine - Can you create shareholder and employee value at the same time?
	14:05	14:20	Madari Zoltán	Ageing, Mortality, Pension	Analysis of elders' habits in Europe according to results of time use surveys in 2010
	14:25	14:40	Muyassar Kurbanova	Well-being	The Demographic Dividend in Uzbekistan. What the South Korean's case can give as a Lesson?
	Tuesday				
	Start	End	Speaker	Session	Topic
Morning, Chair: Vékás Péter	10:10	10:30	Ronald Richman	Ageing, Mortality, Pension	Discrimination-Free Insurance Pricing
	10:35	11:05	Jolanta Perek-Białas	Labour Market	Possibilities and Difficulties of Working Longer versus Exclusion in Late Life
	11:10	11:25	Mágó Mánuel László		Is an older woman disadvantaged compared to her younger peer when employers make hiring decisions? - An experimental study on the Hungarian job market
	11:30	11:45	Fain Máté	Well-being	ESG performance and corporate profitability
	11:50	12:05	Dudás Fanni		Country-level ESG indicators as Predictors of Social Well-Being?

Living Longer, Working Smarter, Ageing Well International Conference

Budapest, Hungary

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SESSION 1: AGEING, MORTALITY AND PENSION

Life Expectancy slowdown in V4 countries

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Abstract

The main objective of the contribution is to show trends in life expectancy in Visegrád 4 (V4) countries in recent years. Life expectancy has increased in all OECD countries over the last few decades. Whilst life expectancy has increased steadily over time, there has been a slowdown in recent years. The aim of our contribution is to describe trends in recent years and then try to find which factors are behind these trends. To examine the slowdown in life expectancy improvements in recent years, changes in life expectancy at birth between 2002 and 2017 were chosen. Generally we can say that causes of this slowdown in life expectancy gains are multifaceted. Mortality at older ages is the primary driver of slowing improvements in life expectancy. It is unclear whether the current slowdown in mortality improvements is long-term trend or not. The slowdown has not been observed for long enough for statistical analysis to determine whether it will continue

Keywords: Life expectancy at birth, V4 countries

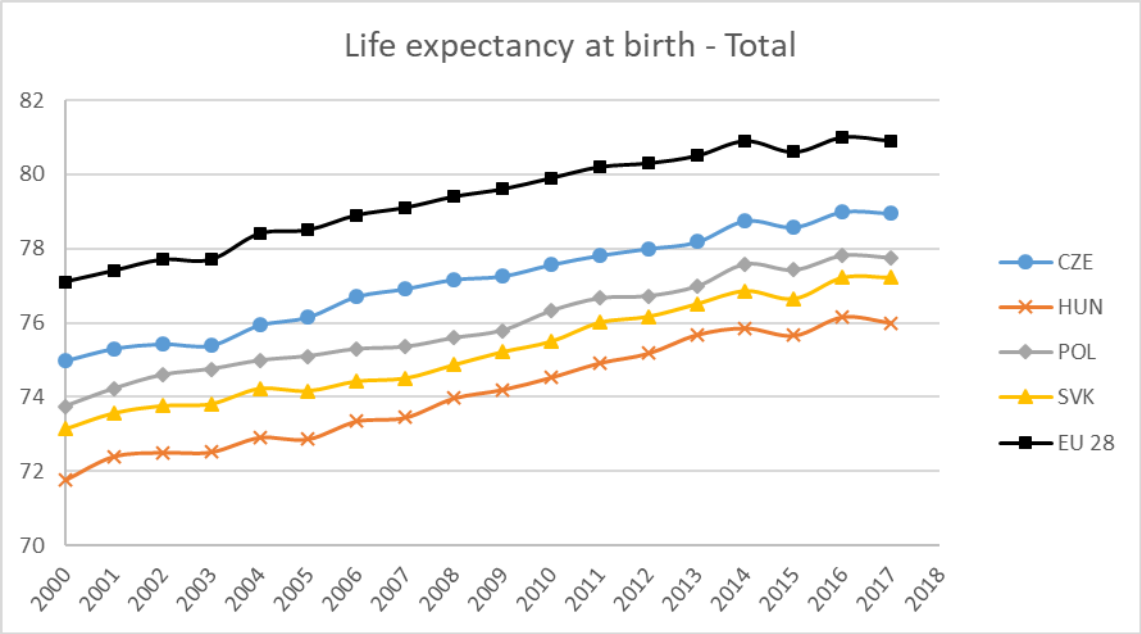
Introduction

Life expectancy is a key indicator for the overall health of a population. Life expectancy at birth measures how long, on average, people would live based on a given set of age-specific death rates. Japan, Switzerland, Spain lead a large group of OECD countries in which life expectancy at birth exceeds 80 years. Our contribution is focusing on central and east European countries especially the Visegrad group (V4) countries – the Czech Republic, Hungary, Poland and the Slovakia. In all V4 countries life expectancy is below the EU 28 average. The Czech Republic, Poland and Slovakia have life expectancy between 77 and 80 years. Hungary has the lowest life expectancy (Table 1.), at less than 76 years in 2017.

Life expectancy has increased in all OECD countries over the last few decades. In 2017, life expectancy at birth was 80.7 years on average across OECD countries, over 10 years higher than it was in 1970.

Whilst life expectancy has increased steadily over time, there has been a slowdown in recent years. Comparing the last five years (2012-2017) with a decade earlier (2002-2007), V4 countries and OECD countries in average as well, experienced slower gains in life expectancy. These gains were slower for females than males. Naturally the question arises: Why have increases in life expectancy slowed down?

Figure 1. Life expectancy at birth – EU 28 average and V4 group countries (total) (2017)



Source: Author's illustration by Eurostat and HMD (2019)

Table 1. Life expectancy at birth, 1970 and 2017 – EU 28 average and V4 group countries (total, male, female)

	Life expectancy at birth, 2000			Life expectancy at birth, 2017		
	Total	Male	Female	Total	Male	Female
EU 28	77,1	73,8	80,5	80,9	78,3	83,7
CZE	75,0	71,7	78,4	79,0	76,1	82,0
HUN	71,2	67,1	75,6	75,8	72,5	79,3
POL	73,7	69,7	78,0	77,7	73,9	81,8
SVK	73,0	69,1	77,2	77,2	73,8	80,7

Source: Eurostat and HMD (2019)

Firstly we look at the trends of life expectancy in V4 countries and then try to find which factors are behind these trends.

We need to emphasize that life expectancy gains fell on average across OECD countries in 2015. The reductions in case of V4 countries were 1.2 months in Poland and 2.4 months in the Czech Republic, Hungary and Slovakia.

Table 2. Slowdown in life expectancy gains, 2012-17 and 2002-2007 – EU 28 average and V4 group countries (total, male, female)

	Change in life expectancy at birth, 2002-2007			Change in life expectancy at birth, 2012-2017		
	Total	Male	Female	Total	Male	Female
EU 28	1,40	1,50	1,30	0,60	0,90	0,60
CZE	1,35	1,48	1,35	0,95	1,04	0,88
HUN	1,66	1,95	1,26	0,82	1,00	0,65
POL	1,22	1,31	1,12	1,03	1,27	1,02
SVK	1,33	1,55	1,07	1,05	1,27	0,82

Source: Eurostat (2019)

Table 3. Change in life expectancy at birth, 2014 to 2015 – OECD average and V4 group countries (total) – change in months

OECD	CZE	HUN	POL	SVK
-1,00	-2,4	-2,4	-1,2	-2,4

Source: OECD Health Statistics (2019)

The causes of this slowdown in life expectancy gains are multifaceted. Among them belong slowing improvements in heart disease and stroke. Rising level of obesity and diabetes, as well as population ageing, have made it difficult for countries to maintain previous progress. There has been a substantial shift in the age structure of population in recent decades, the number and proportion of people older ages has increased. In recent decades, the share of the population aged 65 years or older has nearly doubled on average across OECD countries. The proportion of the population aged 65 years or over increased from less than 9% in 1960 to more than 17% in 2017. Between 2017 and 2050, the share of the population 80 and above will more than double on average in OECD countries, from 4,6% to 10,1%.

Gains in life expectancy at age 65 have slowed in recent years (exception is Slovakia) (Table 5.). Life expectancy at age 65 increased by 10 months on average in OECD countries between 2002 and 2017. Between years 2012 and 2017 this increase was just 7 months. The slowdown in life expectancy at age 65 in 2012-2017 compared with 2002-2007 may be partially explained by the severe influenza epidemic of 2014-2015, which affected frail and older populations in particular.

Table 4. Share of the population aged 65 and over – OECD average and V4 group countries (2017)

OECD	CZE	HUN	POL	SVK
17,4 %	19,0 %	18,8 %	16,7 %	15,3 %

Source: OECD Health Statistics (2019)

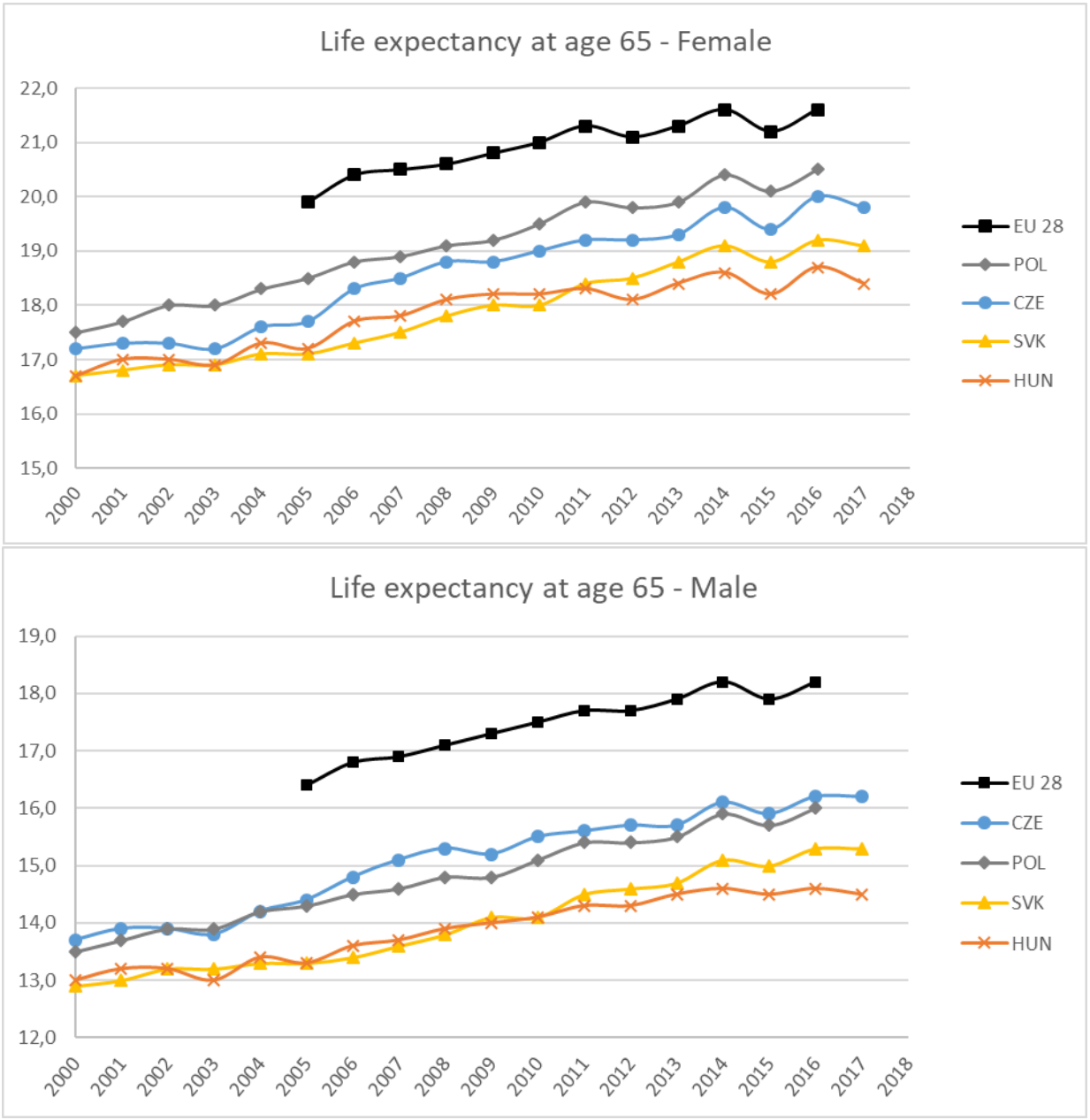
Heart disease and stroke have partly determined the trend in mortality rates in older adults, other causes of death have influenced the trend in younger people. The cause of death that had the biggest negative impact on mortality rates among younger adults was accidental poisoning due to drug or alcohol.

Table 5. Slowdown in life expectancy gains – OECD average and V4 group countries (2017) - gains in months

	OECD	CZE	HUN	POL	SVK
2002-2007	10,32	14,40	7,80	9,60	6,00
2012-2017	6,95	6,60	3,00	5,40	7,80

Source: OECD Health Statistics (2019)

Figure 2. Life expectancy at 65 – EU 28 average and V4 group countries (2017)



Source: Author's illustration by Eurostat and HMD (2019)

What is clear is that continued gains in longevity should not be taken for granted, with better protection of older people and other at-risk populations paramount to extending life expectancy.
Inequality in life expectancy has widened and the improvement in life expectancy has been slower in the more deprived areas than the less deprived area. In addition, female life expectancy in the most deprived areas has actually decreased.

There is a positive association between health spending per capita and life expectancy.V4 countries spend less than the OECD average and have lower life expectancy at birth.

The main conclusion from our contribution is that the overall slowdown in improvement is due to factors operating across a wide range of age groups, geographies and causes of death. It is not possible to attribute the recent slowdown in improvement to any single cause and it is likely that a number of factors, operating at the same time, need to be addressed. The slowdown has not been observed for long enough for statistical analysis to determine whether it will continue.

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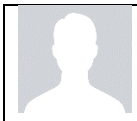
Author biographs

	RNDr. Ján Gogola, Ph.D., Assistant professor of Mathematics at the Institute of Mathematics and Quantitative methods, Faculty of Economics and Administration, University of Pardubice, Czech Republic Research fields: Theory of real functions, Actuarial mathematics. He graduated from The Comenius University in Bratislava, Faculty of Mathematics, Physics and Informatics in 2008 with a degree of Ph.D. in Mathematical analysis. Previous work experience - 2004-2013: Assistant professor of Mathematics, University of Economics in Bratislava, Faculty of Business Informatics, Slovak Republic, Department of Mathematics.

Time transfers between elderly parents and their children: Hungary in European context

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Abstract

In times of population aging and its pressure on social security programmes it is particularly important to understand the determinants of intergenerational family transfers. Here we study exchanges of support between elderly parents and their children in Hungary, which is a rapidly ageing country with low level of public provision of long-term care services. We describe patterns of time transfers received from children using data from the Survey of Health Ageing and Retirement in Europe (SHARE) wave 4. One aim of the analysis is to situate Hungary among the transfer regimes typical in European countries and the other is to describe the main determinants of private transfers and compare Hungary to other EU countries. Multivariate models of the probability of transfers were constructed with both parental and child characteristics as explanatory variables. Results showed that time transfers (personal care and household help) were received by the more „needy" parents, those living alone and having health problems. A gender bias in support was also evident: parents were more likely to receive help and care from daughters compared to sons. Eastern European countries are heterogeneous in terms of non-intensive support, but have generally high level of intensive support.

Keywords: intergenerational solidarity, population ageing, informal care

Introduction

In times of population aging and its pressure on social security programmes it is important to understand the interaction between family support and public redistribution. If ageing states are restricting public financing for pension and long-term

care policies, family transfers are also likely to change: the young might become more inclined to help elderly parents in need or the elderly people might be less able to support younger generations.

The study of transfers between generations is not only important for the understanding of family dynamics but also important to study the effect of public intergenerational transfers on elderly poverty or well-being. The social science literature draws the attention to the possible interaction between public and private intergenerational transfers: these can complement, displace or even reinforce each other. According to the crowding out hypothesis public and private transfers are substitutes and the effect of changes in public reallocations could be to a certain extent neutralized by changes in private transfers (Barro 1974). Increased social security payments might for example, cause children to reduce private transfers to their retired parents. According to the opposite hypothesis of „crowding in" public transfers might even increase family support (Kühnemund and Rein 1999). Interactions between family transfers and public policy programs mean that the overall effect of changes in public policy cannot be assessed without taking into account how family transfers react to those changes. It is thus important to learn about patterns and determinants of private transfers between elderly parents and their children.

In this study we describe patterns of time transfers between elderly parent and their children in Hungary using data from the Survey of Health Ageing and Retirement in Europe (SHARE) wave 4. We also study main determinants of private transfers and compare Hungary to other EU countries.

Research questions and hypotheses

Private transfers can come under various forms, like financial transfers, time transfers (caring for frail elderly, helping with household tasks, caring for grandchildren) or co-residence. Comparative analysis on patterns of private transfers in EU countries show that in Western industrialized countries intergenerational financial transfers typically flow downwards, which means that adult children receive financial transfers from their parents, whereas children support their aged parents by means of time transfers by providing elderly care and household help (Albertini et al. 2007, Albertini and Kohli 2013, Albuquerque 2014, Silverstein 2006). Empirical results show that daughters

support older parents more frequently and are more likely to provide intensive personal care than sons (Walker 1999, Brandt et al. 2012).

Research on private transfers acknowledges that the nature of interaction between private and public transfers depends on the motivation that drives family transfers. According to the economics literature (see Laferrere and Wolff 2004) transfers motivated by altruism lead to public transfers crowding out private transfers. From the point of view of an altruist donor the important is the welfare of the recipient, thus the transfer will not take place if the recipient's needs are satisfied by a public program. In contrast private transfers based on exchange will not be crowded out by public redistribution since welfare state programs enable individuals to engage in exchanges of support, which results in a higher level of private transfers overall. The sociological literature emphasises the role of reciprocity, norms and affection as important motivations of transfer behaviour (Kohli and Künemund 2001). Reciprocity - similarly to exchange - does not imply crowding out and transfers motivated by affection are not expected to be displaced by public programs either (Künemund 2008). Norms of responsibility however might be weakened if generous welfare state program are in place.

Regarding the determinants of private transfers, we build on hypotheses put forward in the social science literature. As mentioned before both economic and sociological studies of private transfers acknowledge the importance that "needs" of potential recipients play in decisions about transfers. Following this argument, we expect that transfers flow in the direction of family members who are in need because of poverty or health problems.

Others see private transfers as part of a reciprocal relationship between parents and children. Reciprocity as the norm of reciprocating for benefits received is most often understood as referring to symmetric relationships. The parent-child relation does not fit this requirement in the short term, since children are unable to reciprocate immediately transfers received during childhood, and elderly parents are unable to reciprocate for the care received. Nevertheless, some studies, like Leopold and Raab (2011) describe patterns of short-term reciprocity between children and their elderly parents.

Difference between countries in the frequency of private transfers can also result from difference welfare state involvement in elderly care. Leitner (2003) distinguishes three types of familialism in European countries based on welfare state arrangements for elderly care. In explicitly familialistic countries such as Germany, Austria, France and Belgium responsibility for elderly care is assigned to the family. These countries provide limited access to public services, impose legal obligations on children to finance professional care for the elderly and support family care with public transfers. Implicitly familialistic countries (Southern European states, Poland) assign to the family not only to finance, but also to provide elderly care for parents. These countries neither provide public services or cash for care schemes. The Scandinavian countries and the Netherlands belong to the group of "optional familialism". These countries provide generous public services to dependent elderly and there are also public transfers for those who engage in caring for dependent family members. There is no legal obligation of family members to care for the elderly.

In Hungary public services in elderly care (institutional care, home care, meals-on-wheels) are scarce, and there is considerable unmet need for long-term care services (Czibere and Gál 2010). There is no explicit cash-for-care scheme, although the public transfer "ápolási díj" (nursing fee) allows for eligibility of those caring for dependent adult family member in special cases. Overall, the bulk of LTC activities is left to households or an informal market. Thus Hungary belongs to the group of implicitly familialistic countries, but with an important difference compared to the Southern European states: coresidence between parents and their elderly children is less frequent.

Data and measurement

The Survey of Health, Ageing and Retirement in Europe (SHARE) 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 from 20 European countries aged 50 or over. In 2011, Estonia, Hungary, Portugal and Slovenia joined SHARE wave 4, which is the third regular panel wave of the survey. Wave 4 contains data for 16 European countries. The survey is probably the richest data on intergenerational private transfers between the elderly and their adult children. The respondent is defined as recipient of time transfer from children if he or she has been receiving personal care

or practical help from children living outside the household or received regular personal care from children living inside the household. Time transfers given to children are based on similar items referring to transfers given but also include time spent with looking after grandchildren.

In the analysis we are analysing private transfers from the respondent's perspective. In case of upward transfers this is the recipient's perspective, while in case of downward transfers this is the donor's perspective. The unit of analysis is the elderly respondent and his or her spouse/partner, if living in the household. Children mean biological children, step-children and sons and daughters-in-law aged 18 years or above. Both coresident and independent children are included. Results were obtained with the use of the household weight

The SHARE survey contains a wide array of variables regarding the respondent's socio-economic background, health status, health care, health behaviour, employment, income, wealth and assets, social networks and attitudes. A great advantage of the dataset that it provides also extensive information on the respondent's children as well. The "family respondent" is also asked about age, gender, marital status, education, employment of the respondent's children.

As measures of parental need we include a measure of difficulties with activities of daily living (ADL), as representing the number of activities the respondent has difficulties with among dressing, bathing, toileting, getting in and out of bed, walking across room, eating. We also include a scale measuring difficulties with instrumental activities of daily living (IADL), which counts the activities the respondent has difficulties with (activities on the list are the following: using a map, preparing hot meal, shopping for groceries, making telephone calls, taking medication, work around the house or garden, managing money). Need for support is also related to the income situation of the elderly. Income is measured as equivalised household income, calculated by dividing household income with the square root of household size.

Parental control variables are age, household structure (single woman, single man, couple, other household structure), education (primary, secondary, tertiary), employment status (not working, working). Variables describing children (all information refers to children above age of 18) are number of children, percentage of female children, average age of children, percentage of coresident children,

percentage of non-coresident children living in close proximity (between 1-5 km) to parents, percentage of children with tertiary diploma, percentage of children in employment and the number of grandchildren.

Results

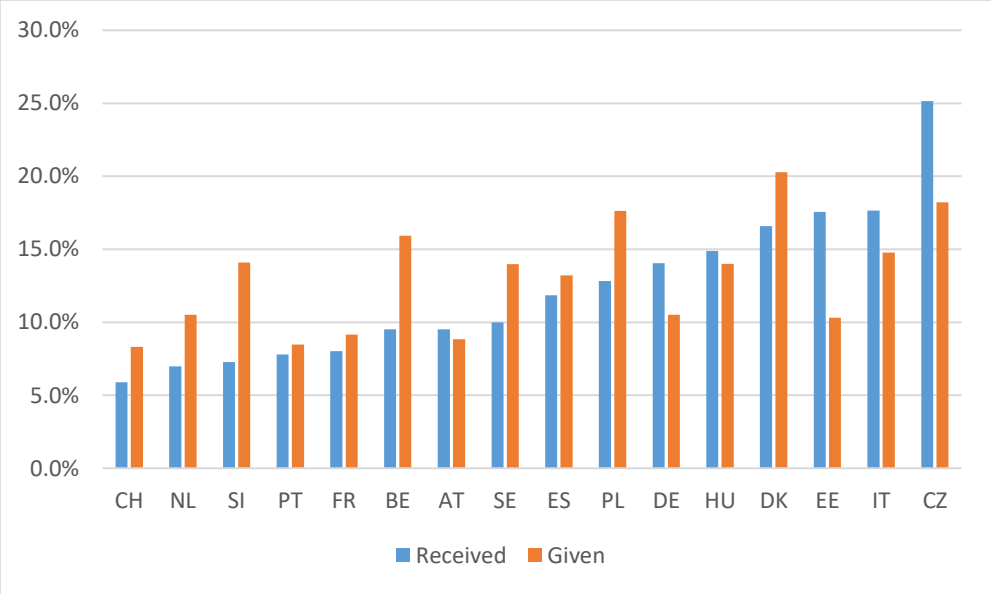
Descriptive results

Here the focus is on support between parents and their children, thus the sample is constrained to households with children. Differences in childlessness are shown in Figure A1 of the Annex. Childlessness is most important in Switzerland, Austria and Belgium where more than 15% of the households do not have children.

First we compare the percentage of those receiving or giving support. The percentage of those 50+ receiving personal care or household help from their children during the year preceding the interview was the highest in the Czech Republic, where 25% of households with children have received such support. Italy, Estonia, Denmark and Hungary follow with percentages between 15 and 20%. Lowest occurrence of support from children to parents was found in Switzerland, the Netherlands, Slovenia and Portugal, where less than 8% of households with children.

In most of the countries giving time transfers (personal care, household help and looking after grandchildren) to children is equally or more frequent among those 50+ as receipt of support. In countries such as Slovenia, Belgium or Poland the percentage of those giving support is 5-7% higher than the percentage of support recipients. In the Czech Republic, Estonia, Germany and Italy the opposite is true: the occurrence of support receipt is higher than the frequency of support giving. In Hungary the receipt of support from children and giving support to children occurs with the same frequency: in nearly 15% of the cases. With this percentage Hungary is among the countries with relatively high frequency of parent child transfers of support.

Figure 1. Percentage of households receiving (giving) support from (to) children (among households with children)



Source: own calculation based on SHARE wave 4.

There is a strong age profile of parent-child transfers. Support given by parents becomes less frequent with age, while support received by parents becomes more frequent with age. The percentage of parents giving support to children declines from 19% (among those below 60) to 7% (among those over 70). Parallel to this the percentage of parents receiving support increases from 7% to 30%.

Results of multivariate regression analysis

We use probit models to study the role of explanatory factors in determining the probability of private time transfers. First we study the determinants of private transfers among all 50+ respondents in Hungary (see Table 1.). In case of support received by parents, significant predictors are those related to parental need, such as marital status and health limitations. Elderly living with their spouse or partner are less likely to receive personal care/household help from their children. Living in couple decreases the probability of receipt of support by 7% points compared to the single elderly. Health limitations increase the probability of support receipt. A one-point increase on the ADL scale results in a 2.4 points increase of the probability of receiving support, while one point increase on the IADL scale increases the likelihood of support by 4 points.

Table 1. Probit estimates of transfer determinants (average marginal effects)

	Parents aged 50+		Parents aged 65+	
	Received from children	**Given to children**	**Received from children**	**Given to children**
Parent characteristics				
Age (years)	0.0033	-0.0075***	0.0080*	-0.0059
Household structure (ref. cat: single man)				
Single woman	0.0300	0.0558	0.0646	0.0922
Couple	-0.0698*	0.0507	-0.1190*	0.0957
Other hhd str	-0.0484	0.0727	-0.0494	0.1200
Education level (ref. cat: primary education)				
Secondary ed.	-0.0362*	-0.0102	-0.0223	-0.0255
Tertiary ed.	-0.0376	-0.0067	-0.0378	0.0005
ADL	0.0239***	0.0236*	0.0233*	0.0234
IADL	0.0380***	-0.0245**	0.0542***	-0.0293**
Working	-0.00536	-0.0774**	0.0870	0.0152
Household income (ref. cat: 1st quintile)				
2nd quintile	0.0255	0.0184	0.0270	0.0378
3rd quintile	0.0208	-0.0109	0.0141	0.0025
4th quintile	0.0026	-0.0260	-0.0159	-0.0357
5th quintile	0.0074	0.0327	0.0547	0.0320
Characteristics of children aged 18+				
Number of children	0.0163	0.0016	0.0270	-0.0049
% female	0.0423*	0.0552*	0.0298	0.0056
% coresident	0.0379	0.0813*	0.0762	0.0265
% living close	0.0268	0.1130***	0.0273	0.0929**
% w. diploma	0.0145	0.0020	0.0057	0.0186
% working	0.0229	0.0060	0.0154	-0.0504
Average age	0.0003	0.0026	-0.0016	-0.0011
No. of grandchildren	-0.0008	0.0105*	-0.0052	0.0021
N	1741	1739	845	844
Pseudo R-sq	0.2198	0.0587	0.2131	0.0767

Note: * p<0.05, ** p<0.01, *** p<0.001

Source:

Among child variables the only significant predictor is the percentage of female children among all children. If the percentage of female children goes from 0% to 100%, the probability of parents receiving support increases by 4% points.

Parental support given to children is associated with parental age and employment. An increase in the age of parents by 10 years decreases the probability of parent providing support to children by 8% points. Employed parents are 8% points less likely to provide support to their children. Parental support to children is positively related to proximity

with children. If all children are living in the same household with the parent, the probability of parents providing support is 8% points higher compared to the case when all children are living in independent households. The probability of parental support to children also increases if there are more daughters among the children. As parental support to children is frequently associated with care for grandchildren it is not surprising to see that the number of grandchildren has a positive effect on the probability of transfers.

As we have seen earlier, private transfers between parents and children have a strong age profile. In order to see whether determinants of transfers are different in by age groups, we have repeated the analysis for those aged 65 or over. Unfortunately, sample size does not permit to select a higher age group. Main results are similar to those seen earlier, although some effects are not statistically significant due to less precise estimates. Parental receipt of support is most strongly associated with parental health measures and marital status. Parental gift of support is more frequent if children live closer.

Conclusions

In this study we have described patterns of time transfers between elderly parents and children and compared these to other European countries. The comparison showed that the frequency of support received from children and given to children is relatively high in Hungary when compared to the other EU countries participating in the study. The relatively high frequency of personal care and practical household help was expected as the involvement of the welfare state in elderly care is low.

As determinants of support received by parents from children we showed that factors associated with parental need (living alone, limitations in daily activities) have the strongest effect on support received. The analysis revealed that time transfers given to children are determined by parental availability (relatively young, not in employment) and also proximity to children.

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Releasing the Potential in Human Resources

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Abstract

Background: A new generation of inequalities within and between countries is emerging with divergence in enhanced capabilities (e.g. access to quality health). These discrepancies have to be reduced in order to fulfil the 3rd Sustainable Development Goal of Ensuring healthy lives and promoting well-being for all at all ages.

Objectives: This article aims at investigating the theoretical maximum of healthy life expectancy at birth for 2016 and possible required measures for obtaining it.

Methods: Calculations were based on ordinary least squares linear regression and hypothesis testing of two independent subsamples.

Results: The theoretical maximum of 76.7 years bears a potential of 9.9 years for Hungary. The nature of the main recommendations is either primarily related to the health system or it can be considered as comprehensive.

Conclusions: The first group encompasses an effective public health care and more prevention in order to cut down lifestyle risk factors, shifting from hospital services towards outpatient services, and preferring day surgery within inpatient services. The second category is composed of spreading sustainable consumption patterns (including that of pharmaceuticals), eliminating environmental harms, and mitigating the education gap in life expectancy through augmented expected years of schooling.

Keywords: healthy life expectancy at birth, sustainability, human resource

Introduction

By designating the direction of the research and carrying out the analysis, the applied approach was inspired by the endeavour of "Enabling everyone to lead a long and healthy life". Hence, the predominant focus is on improving the Healthy life expectancy at birth[1], which can be considered as enhanced capability with divergence within and between countries opposite to the basic capability indicator Life expectancy at birth[2], which demonstrates slow convergence thanks to the declining inequalities.[3]

Two research questions were formulated:

1. What was the theoretical maximum of the Healthy life expectancy at birth in 2016?

2. By means of which major measures can this maximum be achieved?

The literature review with regard to the healthy life expectancy disclosed similar studies focusing on life expectancy or on healthy life expectancy from diverse points of view and identified a presumed gap in the research field. For instance, van Hedel et al. examined the association between education and mortality in the United States and 7 European countries.[4] Lhachimi et al. estimated the potential gains in life expectancy and in morbidity-free life expectancy for 11 EU countries by assuming best practice lifestyle risk factors.[5] Loichinger and Weber compared the working life expectancy at age 50 with healthy life expectancy.[6] Nonetheless, I did not find any articles from the last 5 years, which would handle the estimated maximum of the healthy life expectancy at birth in EU countries through the complex lens of sustainable development and would attempt to quantify the contribution of the particular components.

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[1] Healthy life expectancy at birth: "Average number of years that a person can expect to live in full health by taking into account years lived in less than full health because of disease and injury." (UNDP-HDR, 2018, pp. 53.) Its value varies mainly between 68 and 56 years across the Earth. (UNDP-HDR, 2019, pp. 38.)

[2] Life expectancy at birth: "Number of years a newborn infant could expect to live if prevailing patterns of age-specific mortality rates at the time of birth stay the same throughout the infant's life." (UNDP-HDR, 2018, pp. 25.)

[3] (UNDP-HDR, 2019, pp. 6-9., 228.)

[4] They concluded that "the larger educational inequalities in mortality in the United States than in many European countries suggest that policies (within and outside the health sector) that address this inequality and the health of the most disadvantaged groups might contribute to improve overall population health in the United States." (van Hedel & al., 2015, pp. 112., 118.)

[5] (Lhachimi & al., 2016, pp. 739-741.)

[6] Their difference in Europe ranges between 0.5 and 12 years for men, whereas it is 3-17 years for women. (Loichinger & Weber, 2016, pp. 1203.)

Data analysis and findings

Determining the theoretical maximum of the healthy life expectancy at birth

Based on 29 countries[7], the following Ordinary Least Squares Linear Regression model can be built on the Preventable causes of mortality[8] (X_1) and the Ambient and household air pollution attributable death rate[9] (X_2) as predictors for estimating the Healthy life expectancy at birth[10] (Y):

$$\hat{Y} = \hat{\beta}_0 + \hat{\beta}_1 \cdot X_1 + \hat{\beta}_2 \cdot X_2 = 76.6576 - 0.0279 \cdot X_1 - 0.0149 \cdot X_2$$

The confidence interval of the intercept at a significance level of 5% is [76.0854;77.2297] years. The R square is 95.84%, the adjusted R square is 95.52%, and all beta parameters are significant. At the state of medicine in 2016, the intercept indicates the maximum[11], which is equivalent to a potential of 9.86 years in case of Hungary. The model underestimates the Hungarian fact value ($66.35 = \hat{Y}^{HU} < Y^{HU} = 66.8$), for this reason, the decomposition of the potential can be calculated as follows:

Cutting back all preventable causes of mortality by dint of effective primary prevention and public health care: $abs\left(\hat{\beta}_1 \cdot X_1^{HU} \cdot \frac{\hat{\beta}_0 - Y^{HU}}{\hat{\beta}_0 - \hat{Y}^{HU}}\right) = 8.68$ years

Eliminating environmental harms: $abs\left(\hat{\beta}_2 \cdot X_2^{HU} \cdot \frac{\hat{\beta}_0 - Y^{HU}}{\hat{\beta}_0 - \hat{Y}^{HU}}\right) = 1.18$ years

[7] EU-27 (Bulgaria was removed in order to improve the fit of the model), plus Norway and Iceland.

[8] "Preventable mortality is defined as death that can be mainly avoided through public health and primary prevention interventions. Treatable (or amenable) mortality is defined as death that can be mainly avoided through health care interventions, including screening and treatment. Both indicators refer to premature mortality (under age 75). The data is based on the revised OECD/Eurostat lists."
Preventable causes of mortality (2016): (OECD/EOHSP, 2020, Figure 10)

[9] In order to disclose the interrelatedness between the healthy life expectancy at birth and a restored ecosystem without disturbing effects on the human organisation, the benefits arising from the elimination of air pollution were estimated by assuming that air pollution comprises the majority of the causes of mortality attributable to environmental harms.
Ambient and household air pollution attributable death rate (2016): (WHO, 2020)

[10] Healthy life expectancy at birth (2016): (UNDP-HDR, 2018, pp. 50-51.)

[11] Many alternative models were created for validating the result for the maximum of the Healthy life expectancy at birth by relying on two data sources with various composition and more predictors.

Regarding the lifestyle risks[12], mitigating Dietary risks, Alcohol consumption and risks arising from Low physical activity could favourably influence the Healthy life expectancy at birth as shown in Table 1.

Table 1:

Relationship between Lifestyle Risk Factors and the Relevant Variables

Correlation Coefficient (Pearson)	Healthy Life Expectancy at Birth	Preventable Causes of Mortality
Dietary Risks	-89.99%	+85.78%
Alcohol Consumption	-58.26%	+62.29%
Low Physical Activity	-73.81%	+70.03%

Source: Author's compilation (2020)

Shifting from inpatient towards outpatient services, preferring day surgery

In order to estimate the recommended level for the ratio between Outpatient care and Inpatient care, the 29 previous countries were aligned in ascending order according to their healthy life expectancy at birth. Both the cumulative average healthy life expectancy at birth and the cumulative average ratio (Expenditures on outpatient care per capita / Expenditures on inpatient care per capita[13]) were weighted based on the total population[14] of the underlying countries. Although the trendline is not monotonous, the proposed ratio is above 105%. Two-sample asymptotic z tests confirm that the mean of the country group with higher ratio exceeds that of the country group with lower ratio. Nevertheless, these results are valid on aggregated level, which view alleviates the influence of country-specific circumstances (e.g. effects of climate).[15]

[12] Estimates of the Lifestyle risk factors (2017) are provided by the Institute for Health Metrics and Evaluation: (OECD/EOHSP, 2020, Figure 5)

[13] Health expenditures by function of health care (2017): (OECD/EOHSP, 2020, Figure 8)

[14] Total population (2016): (World Bank Group, 2020)

[15] Particular cases (like France) serve as counter-examples for that the preponderance of inpatient care may lead to high healthy life expectancy at birth but revising the allocation of expenditures may enhance efficiency similar to the case of the excelling Spain. By applying a low ratio of 92.75%, Hungary performs 66.8 years of healthy life expectancy at birth, which could be ameliorated by means of a reconsidered distribution of health expenditures in favour of outpatient services.

16 main and 4 sub-procedures[16] were analysed whether they offer the opportunity for an enlarged proportion of day surgery: either a convergence towards 100%, or a considerable potential for growth proves to be feasible in numerous cases.[17] The relationship between the healthy life expectancy and the share of day cases finds evidence in a positive medium correlation.[18]

Responsible consumption patterns

The 12th Sustainable Development Goal envisages ensuring sustainable consumption and production patterns, which embody avoiding overconsumption of medicaments as well. The interrelatedness between the Healthy life expectancy at birth (Y – dependent variable) and the Expenditures on pharmaceuticals and medical devices[19] (X - predictor) is scrutinised by dividing the countries into two groups (whether the healthy life expectancy exceeds 71.5 years) as two distinct phenomena prevail. The first cluster contains selected best practice Mediterranean and Scandinavian countries where the healthy life expectancy at birth reached at least 71.8 years, whilst the second one incorporates members joined the EU in 2004 and thereafter. The efficient medical consumption patterns of 2017 can be demonstrated by virtue of the equations below:

- above 71.5 years[20]: $Y = 0.0102 \cdot X + 68.270$ (R square: 86.12%, adjusted R square: 82.65%, both beta parameters are significant);
- below 71.5 years[21]: $Y = 0.0151 \cdot X + 63.335$ (R square: 70.67%, adjusted R square: 63.33%, both beta parameters are significant).

Hungary's figure of 448.89 EUR represents a level of expenditures, which could enable – in case of efficient use and treating health problems not symptom-centric – to maintain a healthy life expectancy at birth of 70.1 years in a newcomer country or even 72.8 years in a more developed state. The two functions draw the attention to the dissimilarity of views and raise the question of the nature of the process of catching-up, i.e. whether the former satellite countries and several Western nations will be able to follow the traces of best practice states and to increase the healthy life expectancy

[16] Total number of procedures, Number of day cases, Share of day cases (2016): (OECD.Stat, 2020)
[17] Example for the first group: Cataract surgery (Hungary: 54.9%, OECD average: 64.7%, countries above 95%: Spain, United Kingdom, etc.). Example for the second one: Inguinal hernia, Tonsillectomy.
[18] Its value lies between +0.318 and +0.436. The range of the number of OECD countries: 22-28.
[19] Health expenditures by function of health care (2017): (OECD/EOHSP, 2020, Figure 8)
[20] Best practice countries: Denmark, Iceland, Italy, Norway, Spain, Portugal.
[21] Best practice states of the ancient Eastern Bloc: Croatia, Czech Republic, Estonia, Poland, Romania, Slovenia.

at birth without an unjustified and thus avoidable medicament overconsumption. In addition, the models anticipate that the higher the achieved healthy life expectancy amounts, to the less extent medical products, appliances and equipment can contribute to the further increment in the healthy life expectancy.

The responsible consumption patterns shed light on the expansion of overweight (including obesity). Its measured and self-reported percentage[22] varied between 41.8% and 72.5% among adults in 2017 in the 26 European OECD countries, while the example of Japan (25.9%) and South Korea (33.7%) testify that a viable compromise does exist, if efforts are complemented by the fight against food waste and malnutrition.

Mitigating the education gap[23] in life expectancy

The education gap in life expectancy at age 30 was 12.6 years for men and 6.4 years for women in 2016 in Hungary. Bifurcating the sample consisting of 21 European countries into more and less developed societies according to the education gap, a significant difference in the mean of the expected years of schooling[24] for males can be perceived. In order to overcome its education gap, Hungary should amplify the expected years of schooling for males from 14.8 years to 16.5-16.8 years.[25] Concerning females, the relation between the education gaps can not be underpinned with the expected years of schooling. However, Hungary should advance by raising this indicator from 15.4 years to 17.2-17.4 years in order to attain the average.

Conclusions

The study revealed the maximum theoretical potential of healthy life expectancy at birth for 2016, moreover, additional yearly accrual can be realised in the future. If the individuals become more conscious and take more responsibility for their health status and the environment, it is possible to release the uttermost part of the potential through

[22] Overweight including obesity among adults by sex, measured and self-reported (2017 or nearest year): (OECD iLibrary, 2020)
[23] "High education is defined as people who have completed a tertiary education (ISCED 6-8) whereas low education is defined as people who have not completed their secondary education (ISCED 0-2)." (OECD/EOHSP, 2020, Figure 2) The education gap equals to their difference.
Education gap in life expectancy at age 30 (2016 or available year): (OECD/EOHSP, 2020, Figure 2)
[24] Expected years of schooling: "Number of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child's life." (UNDP-HDR, 2018, pp. 25.) Expected years of schooling (2017): (UNDP-HDR, 2018, pp. 34.)
[25] The share of males was determined from that of females within the population. Female population (% of total population) (2016): (World Bank Group, 2020)

prevention and effective public health interventions, plus greening each sector. A new quality-oriented system approach within the inseparable society-environment-economy framework is required: the emphasis should be put on the improvement of the healthy life expectancy in lieu of that of the life expectancy so that the growth in healthy life expectancy can surpass that in life expectancy. The convergence between the two indicators necessitates the active participation of the individuals who can, in turn, only benefit from this process.

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Author biographs

Gábor Vona

After finishing my studies in Actuarial Sciences at the Corvinus University of Budapest, I carried out activities as actuary and product developer between 2006 and 2014 in Hungary and in the Netherlands. Subsequently, I could gain insights during 1-1 year in the civil, later in the information and communication technology sector. From 2018, I turned to the field of Sustainable Development by performing assignments as volunteer to the benefit of NGOs. In order to deepen my knowledge and evolving into a researcher, I started my PhD studies in Sustainability Management in 2019 at my alma mater.

Empirical Evidence of the Rotation of the Age Pattern of Mortality Decline

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Abstract

Rotation of the age pattern of mortality decline refers to two phenomena supposedly occurring simultaneously: decelerating mortality decreases at younger ages and accelerating improvements in elderly populations. Several researchers have documented these processes in the literature, especially in highly developed countries. After a concise summary of the most relevant sources, a simple, largely data-driven methodology with few assumptions is used to empirically examine the rotation phenomenon in historical mortality datasets of the G7 countries[26], using United Nations data from the period between 1950 and 2015 for both genders.

In line with earlier findings about European Union member states, my results indicate that the presence of rotation is far from universal, even in highly developed countries. There is strong evidence of rotation in both male and female populations only in the case of Japan, and no evidence of rotation whatsoever in US data. Therefore, it is

[26] 1 The Group of Seven consists of Canada, France, Germany, Italy, Japan, the United Kingdom and the United States of America.

necessary to exercise appropriate caution before applying forecasting procedures such as the variant of the popular Lee–Carter model that includes rotation.

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Introduction

Several mortality researchers have noted a historical pattern of diminishing mortality decline at relatively younger ages, accompanied by accelerating improvements at more advanced ages (Christensen et al. [2009]). Li–Lee–Gerland [2013] call this phenomenon the “rotation” of the age pattern of mortality decline, which is captured by a counterclockwise rotation in Figure 1.

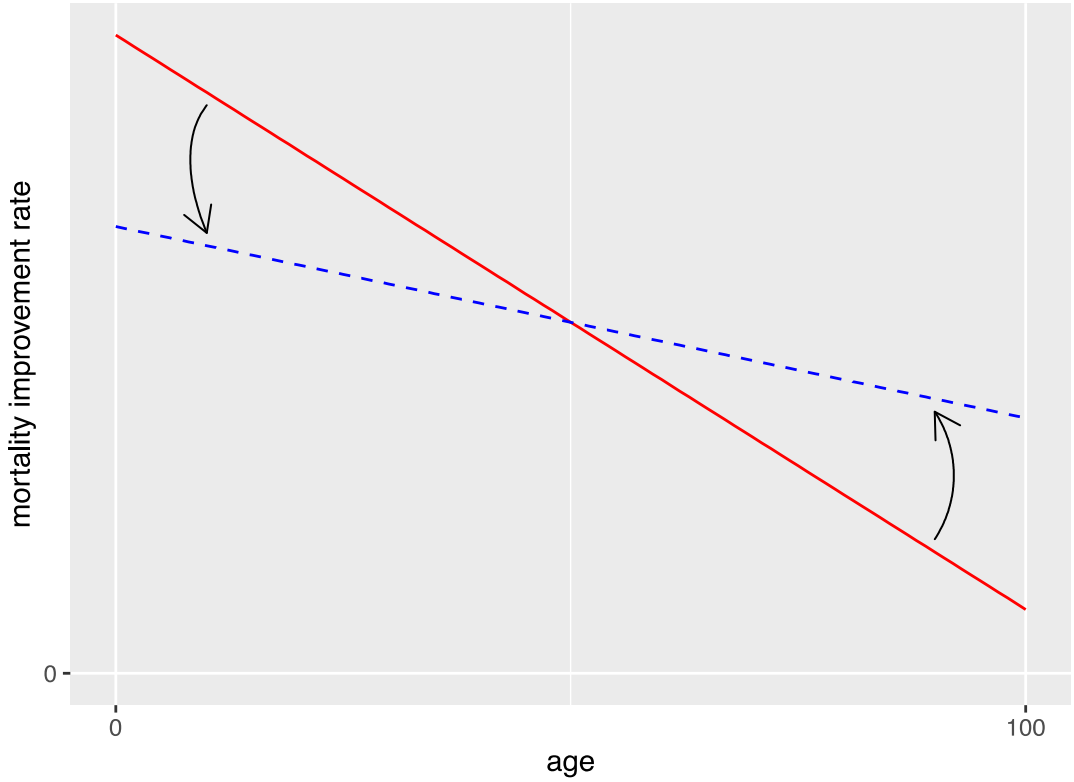

Fig. 1: Rotation of the age pattern of mortality decline (stylized illustration, source: Vékás [2019])

A somewhat simplistic explanation of the rotation is that longevity increases used to be driven by rapidly declining infant and childhood mortality rates (e.g., due to widespread vaccination programs and improved child nutrition) – and to some ex- tent, by improvements in middle-aged mortality –, where spectacular advances are less and less possible, but on the other hand, better medications, nutrition and lifestyle choices for the elderly and costly medical procedures to extend life at higher ages are increasingly available.[27] It should be noted that the investigation of the causes of the rotation falls outside the scope of this paper.

The practical significance of the topic lies in the fact that ignoring rotation in long- term mortality forecasts leads to the systematic underestimation of the elderly population, which exacerbates longevity risk. These underestimation errors have a cumulative

[27] Li–Lee–Gerland [2013] argue that the rotation is more prevalent in developed countries characterized by low mortality, which is consistent with this explanation. Elderly mortality itself is far from homogeneous, and this general description may hold for some age groups and countries and not for others.

nature and may be surprisingly severe in the long run (see e.g. Vékás [2018]). This may lead to serious financial consequences for life and health insurers as well as pension schemes.

Mortality forecasting techniques play a key role in demography, life insurance and pensions. Due to the immense and ever-growing literature on these methods (see e.g. Booth–Tickle [2008] and Pitacco et al. [2009] for comprehensive reviews), an exhaustive overview is not attempted here, but instead, this paper will only focus on sources related to the rotation phenomenon.

The famous paper of Lee–Carter [1992] has probably been the most important break-through in the history of mortality forecasting. The authors model the logarithm of the central mortality rate at age x and calendar year t as

$$\log m_{xt} = a_x + b_x k_t + \varepsilon_{xt} , \qquad (1)$$

where ax represents the mean of the observed logarithmic central mortality rates for a given age, the time series k_t captures the evolution of the overall level of mortality across time, and b_x denotes the speed of mortality decline for every age.

As the parameters b_x do not depend on time, and the time series kt is overwhelmingly assumed to follow a linear pattern (Tuljapurkar et al. [2000]), age-specific mortality declines at a constant speed in the Lee–Carter model, and the rate of improvement only depends on the age of the individual in question. The latter implicit assumption of the model has attracted intense scrutiny by the scientific community (see e.g. Kannisto et al. [1994], Horiuchi–Wilmoth [1995], Lee–Miller [2001], Carter–Prskawetz [2001], Rau et al. [2008] and Christensen et al. [2009]).

Several approaches have been developed to address this inflexibility of the classic Lee–Carter framework. Notably, Li–Lee–Gerland [2013] have incorporated the rotation into the original procedure[28], where instead of Equation (1), they model the logarithms of central mortality rates as

$$\log m_{xt} = a_x + B(x,t)k_t + \varepsilon_{xt}. \quad (2)$$

The parameters $B(x,t)$ in Equation (2) capture the rotation phenomenon by converging smoothly across time from their initial levels corresponding to b_x in Equation (1) to their assumed ultimate levels, as life expectancy at birth advances from an initial threshold to an upper ceiling (the authors propose 80 and 102 years, respectively) in the original

[28] Li–Gerland [2011] present an earlier, not fully developed version of this approach.

model described by Equation (1). It is important to note that the authors recommend their model for low-mortality countries and very long forecasting horizons, and knowledge of the estimated parameters of the original Lee–Carter model is sufficient to fit the rotated model to data. Ševčíková et al. [2016] and Dion et al. [2015] recently incorporated this technique into population projections for the United Nations Population Division and Statistics Canada, respectively.

Another solution is to capture the rotation by modeling the evolution of age-specific mortality improvement rates instead of mortality rates, as proposed by Haberman–Renshaw [2012] and Mitchell et al. [2013], among others. Bohk-Ewald–Rau [2017] follow this line in a Bayesian framework capable of combining mortality trends of different countries. These approaches are data-driven, as opposed to Li–Lee–Gerland [2013], who impose a somewhat arbitrary process on age-specific mortality improvement rates, as they are of the opinion that empirical evidence of the rotation is too subtle to govern forecasts.

Yet another alternative is the approach of Booth et al. [2002] and Hyndman–Ullah [2007], who recommend using more than one interaction of age- and time-dependent parameters in Equation (1) in order to capture the non-constant evolution of age-specific mortality improvement rates, which produces so-called multi-factor mortality forecasting models. Bongaarts [2005] proposes a shifting logistic model to de- scribe the transition in the age pattern of mortality decline. Li–Lee [2005], Cairns et al. [2011], Russolillio et al. [2011] and Hyndman et al. [2013] model mortality rates of several populations in a coherent framework. In a multi-population setting, age-specific rates of mortality improvement are not necessarily constant due to interactions among different populations. Further recent developments in this field are described by de Beer–Janssen [2016] and Li–Li [2017].

Based on data from 28 European Union member states and the period between 1950 and 2015, Vékás [2019] concludes that the rotation only took place in a few member states, with only 11 of them displaying statistically significant evidence for rotation at the 5% level in case of both genders, while apparently no rotation at all (or even on the contrary, an anti-rotation) in many others. Additionally, the rotation was more prevalent in female than male populations. Contrary to Li–Lee–Gerland [2013], Vékás [2019] argues that the presence and strength of the rotation phenomenon appear to be largely unrelated to life expectancies at birth in the European Union as a whole: positive and negative cases appear among both low- and high-mortality countries, and the strength

of the association between these two variables is apparently statistically negligible. On the other hand, there is significant evidence for a positive correlation between degrees of rotation and life expectancies at birth among member states that used to belong to the Eastern Bloc during the Cold War.

Data and methods

The statistical analysis presented in this paper was performed in R (R Development Core Team [2008]) using mortality rates, life expectancies at birth and population counts of the Group of Seven, which consists of Canada, France, Germany, Italy, Japan, the United Kingdom and the United States of America These indicators are available for both genders, all G7 countries, 22 age groups (0, 1-4, 5-9, 10-14, …, 95-99 and 100 years and older) and 13 calendar periods (1950-1955, 1955-1960, …, 2010-2015).[29] All data are the courtesy of the UN World Population Prospects 2017 ([United Nations [2018]]).

Mortality improvement rates and measures of rotation were computing using the population-weighted non-linear correlation approach introduced by Vékás [2019], and one-sided *z*-tests (Pinto da Costa [2015]) with

$H_0: \rho^{cg} \leq 0, \quad H_1: \rho^{cg} > 0 \quad (5)$

were used to test whether degrees of rotation were significantly different from zero.

Conclusions

Figures 2 and 3 display degrees of rotation in male and female populations of the G7 countries, as well as the critical values at the 5% and 1% significance levels of the hypotheses defined by Equation (5). Table 1 in the Appendix contains the exact values of ρ^{cg} as well as the *p*-values of the above test by country and gender.

[29] Every period spans 5 years and starts and ends on July 1 of the respective years. The grouping of ages and calendar years smooths the data (akin to moving averages) so that they contain less undesirable random fluctuations.

Evidence for rotation is significant at the 5% level in male populations of Canada, Germany, Italy and Japan, as well as in female populations of Italy, Japan and the United Kingdom. This suggests that rotation of the age pattern of mortality decline was far from universal in the G7 countries between 1950 and 2015, similarly to the findings of Vékás [2019] about European Union member states.[30]

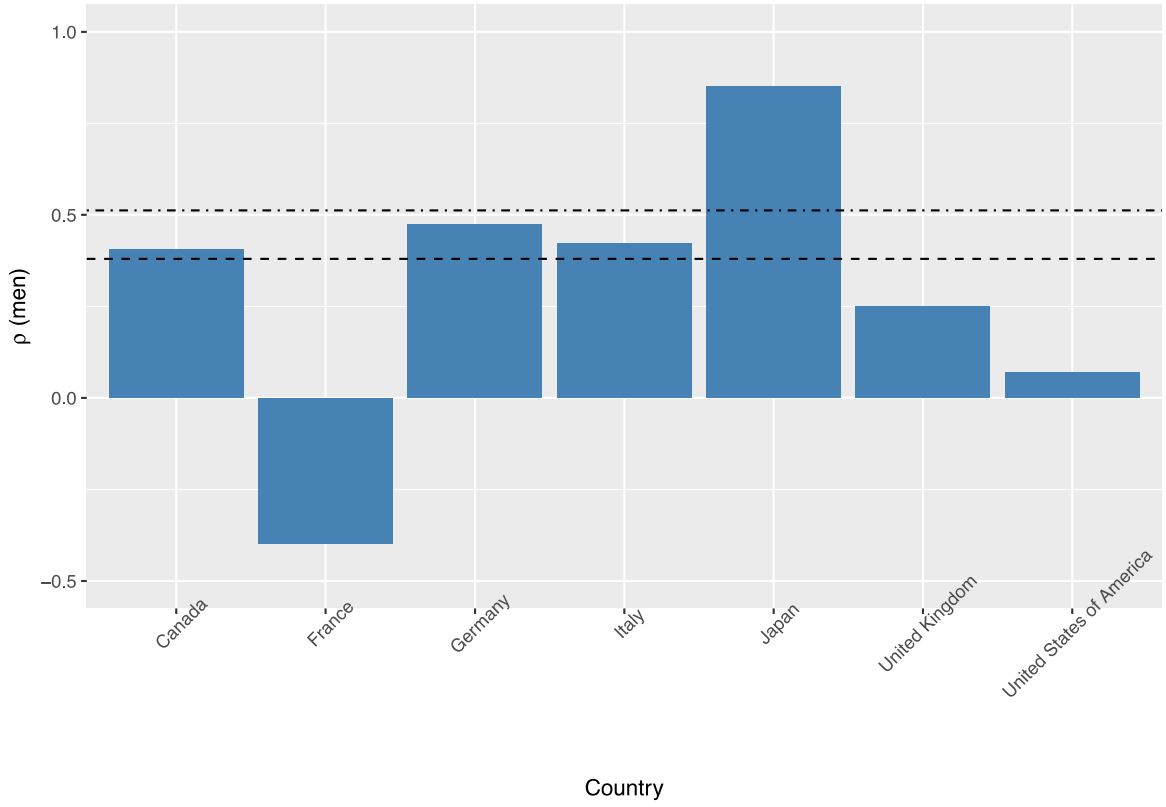

Fig. 2: Degrees of rotation (measured by Spearman's ρ) by country for male populations. The dashed and dotted-dashed lines denote the one-sided critical values at the 5% and 1% significance levels, respectively.

Apparently, no statistically significant rotation took place among either males or females in France and the United States of America.[31] Only Japan has strong evidence of rotation for both genders at the 1% significance level.

[30] A stricter testing framework might take into account that 14 null hypotheses are being tested simultaneously. Hence applying the popular Bonferroni adjustment for controlling the familywise error rate (see Frane [2015] for a critical discussion), the *p*-values below 0.05 / 14 = 0.0036 imply statistical significance at the 5% level.

[31] Results are even more mixed and provide less evidence of the rotation if a 1% significance level or the Bonferroni adjustment are applied.

As the rotation phenomenon may jeopardize the reliability of mortality forecasts for pension schemes as well as life and health insurers, which may lead to severe financial consequences (Vékás [2018]), it is essential to be aware of the possibility of its presence and apply appropriate forecasting procedures that take it into consideration, whenever necessary.

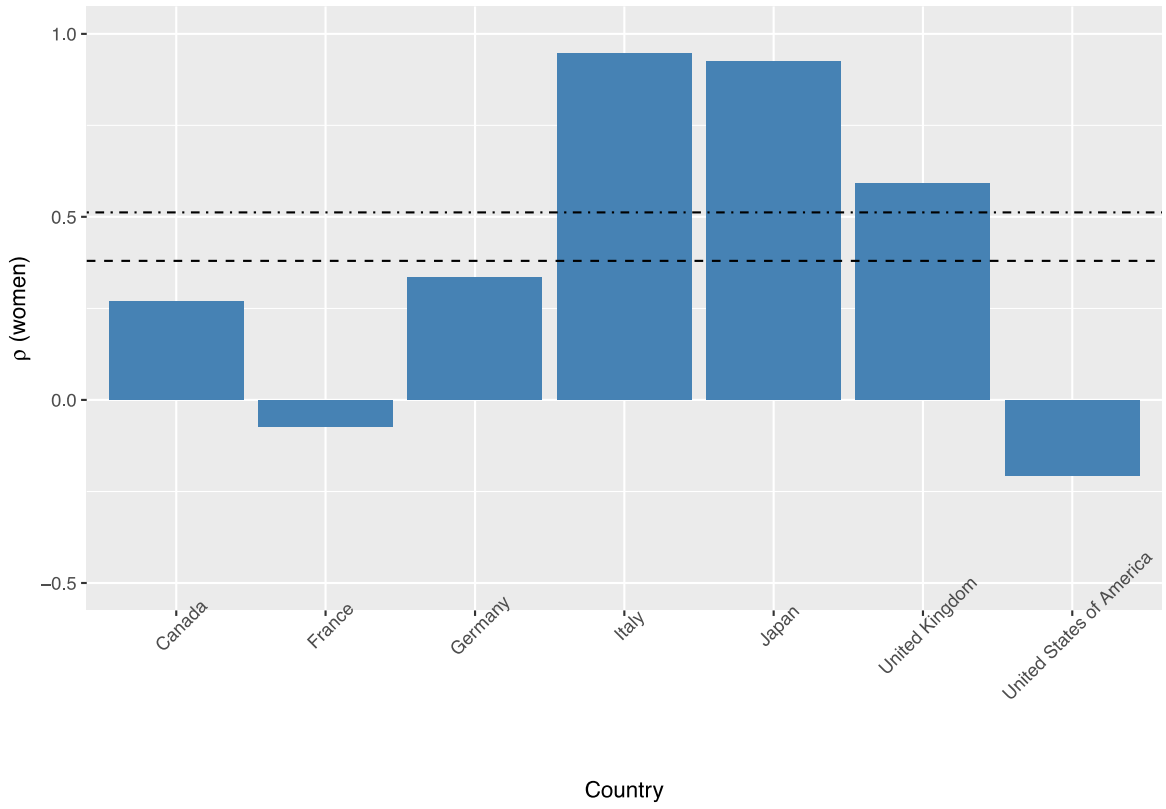

Fig. 3 Degrees of rotation (measured by Spearman's ρ) by country for female populations. The dashed and dotted-dashed lines denote the one-sided critical values at the 5% and 1% significance levels, respectively.

As the immensely popular Lee–Carter [1992] mortality forecasting model ignores rotation, in some cases, it is advisable to use the particularly promising Li–Lee–Gerland [2013] variant of the original method, but if and only if there is enough evidence for rotation in the data series. The methodology and results applied in this paper may facilitate the choice of the appropriate forecasting technique in actuarial practice.

Appendix

	Men		Women	
Country	ρ	Sig.	ρ	Sig.
Canada	0.405	0.039 *	0.268	0.13
France	-0.397	0.958	-0.072	0.617
Germany	0.475	0.017 *	0.334	0.076
Italy	0.422	0.032 *	0.946	< 0.001 ***
Japan	0.85	<0.001***	0.924	< 0.001 ***
UK	0.249	0.148	0.592	0.003 **
USA	.071	0.385	-0.206	0.805

Table 1: Degrees of rotation ρ^{cg} by country and gender and one-sided *p*-values (.: 0.05 < *p* < 0.1, *: 0.01 < *p* < 0.05, **: 0.001 < *p* < 0.01, ***: *p* < 0.001)

Source:

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Analysis of elders' habits in Europe according to results of time use surveys in 2010

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Abstract

Aging population is one of the most significant demographic processes in the European countries in the 21st century. Mostly, two issues are analyzed: As the proportion of the active population shrinks, the welfare systems could become unsustainable. Secondly, at the level of individuals, it is important for older people to have the chance for healthy, well-balanced and peaceful life. However, little is said about how the elders spend their days. Our research focuses on analyzing the differences of elders' habits in Europe according to results of time use surveys in 2010. We have made a cluster analysis of European countries using several variables for example sleeping, eating, household and family care, cleaning dwelling, leisure, reading books, travel, TV watching, radio and music listening. Two clusters can be distinguished. Northern and Western part of Europe belongs to the first group. The second cluster includes Southern and Central European countries. We argue that there are significant differences in elders' habits in Europe, and it could determine remarkably the quality of life.

Keywords: time use survey, cluster analysis, aging population, habits of the elderly

Introduction

In the European Union and the most part of the whole World one of the biggest issues is aging population. It is a huge challenge for the society and the economy as well. According to the European Commission (2020) the proportion of people over 65 will be almost 30% by 2060. As the elderly layer of the society is getting larger, the proportion of younger generation is decreasing. This demographic process puts significant burden on pension systems, health care and elderly care systems. One solution and way to disburden the care systems is active aging. The aim is a more active and healthier pensioner life perspective. It is important, because elder people could be active on labour market. In this way labour market impacts could be moderated. By being more active, people's health condition is getting better which means a relief for health care system too. In 2012 European Union started to promote active aging, and the Council of the European Union (2012) addressed guiding principles for that purpose. The key points of that are employment, participation in society and independent living.

In our research we focused on the time management of the pensioners in 17 European countries. We analyzed the time use survey from 2010. The aim of the investigation was to find patterns among countries and to observe the possible differences among the created groups.

Literature Review

Active aging and the security of elderly people has broad literature. We chose those which directly connect to our research question.

Hoff (2008) investigated the poverty and social exclusion of older people in Europe. He pointed that the risk of poverty has diverging trends among European countries. Poverty has huge effect on standard of living, life and health quality for elders. The author listed good examples to boost social and economic inclusion of elder people such as the Finnish "workability" policy, women's early retirement program from Czech Republic (rewarding having more children) etc. He argued that social participation of elder people is indispensable. The author gave several good examples and directions to social policy makers.

Walker (2008) showed that, the life expectancy has increased decades by decades and it has connection to welfare in Western Europe. Active aging is not a new phenomenon, this has been reality in policy from 80s. Walker argued that the policy makers in employment, health, pensions, and education areas should take into consideration the active aging seriously. He outlined seven key principles: activity, prevention, inclusion, solidarity, rights, strategy, national and cultural diversity. He highlighted the differences between the North and South.

Foster and Walker (2015) also wrote about the concept of active aging and how the European Union implemented it in policy making. One of the main points for a common solution is also the last, seventh key point, the national and cultural diversity. Diversity is not a national phenomenon, it is occurred within countries, too. Because of this reason, they suggested an eighth point relating to flexibility in policy making. The eight points are important to decrease the burden on economic, health care and social care system.

Data

Time use survey is used to register the daily activities and the time spent within a defined period in chronological order. Time use surveys are harmonized in the Member States of the EU and data collections are carried out every ten years. Unfortunately, Eurostat publishes only the data for year 2010, the results are not available for 2000. We downloaded time use survey data relating to elder people (with age of more than 65 years) for the following EU and non EU countries: Belgium, Germany, Estonia, Greece, Spain, France, Italy, Luxembourg, Hungary, Netherlands, Austria, Poland, Romania, Finland, United Kingdom, Norway and Serbia. Time spent for a specific activity is expressed in hours and minutes. We converted the data to minutes, and we selected the most significant activities according to the time spent. This dataset was the base for our analysis. We wanted to show how elder people spend their time and what the differences are among countries.

Methodology and results

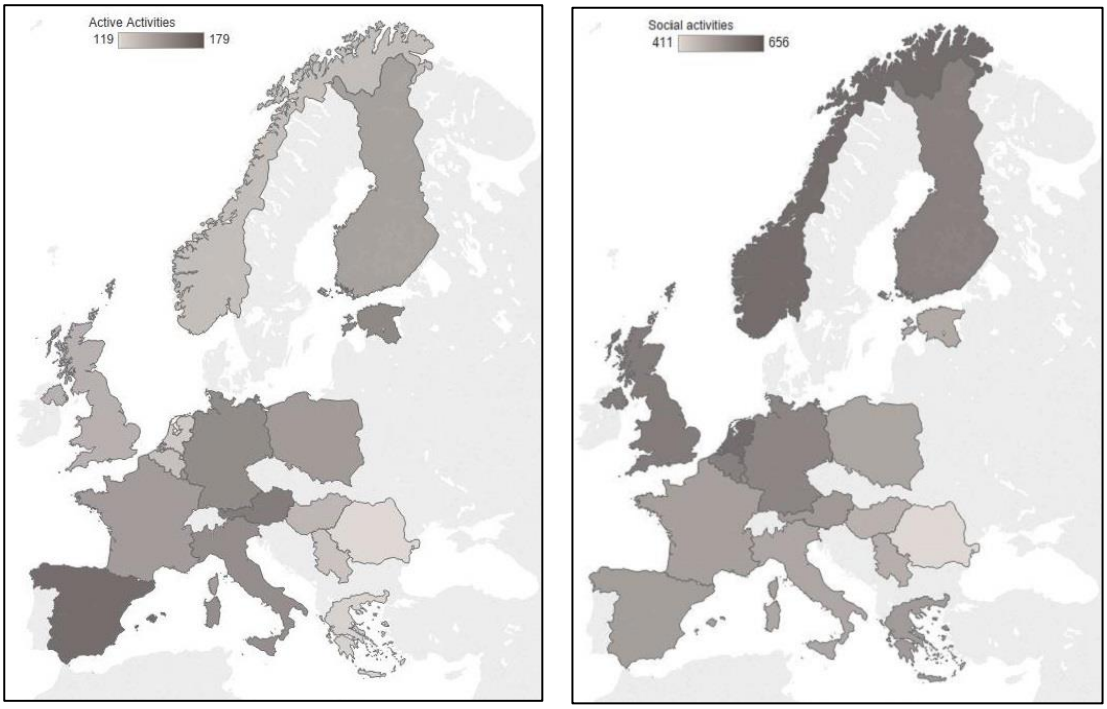
In order to explore regional differences, we have chosen the method of cluster analysis with software SPSS. We selected the option of K-means cluster with cluster number of

2. This is suitable because we have only seventeen countries and groups with nearly the same number of cases are formed. We also created hierarchical cluster analysis for standardized variables, it had the same result.

- The first cluster includes the Northern and Western part of Europe, namely Belgium, Germany, Netherlands, Finland, United Kingdom and Norway.
- The second cluster includes Southern and Central European countries: Estonia, Greece, Spain, France, Italy, Luxembourg, Hungary, Austria, Poland, Romania and Serbia.

The result is consistent with the literature. The two clusters reflect the cultural and national differences between the Northern and the Southern-Eastern countries.

Figure 1: Active and Social Activities



Source: own construction

We grouped the different daily activities. ‘Active’ activities contain household tasks, sports, every ‘movements’. The left map in Figure 1 shows a mixed picture about that, but it is clear the highest values belong to the South. Social activities show the social participatory and inclusion. It is obvious - based on the right map in Figure 1 - that the highest values belong to the North. They have more social facilities, more traveling. It comes from their welfare and cultural position.

After that we made an ANOVA (Analysis of Variance) test to investigate the differences between the clusters. The null hypothesis of the test is that all the groups have the same average. It means that there is no difference between the groups of countries.

An F-statistics is computed for each observed variable. Using p-value, we can determine whether the two groups differ regarding the given variable. Based on the final cluster centers, characteristics of habits of elderly people can be clearly determined. The following table shows the effects, we made our decision on 5% significance level.

Table 1: Results of ANOVA

Difference between the clusters	Activities of elder people
Significant	Personal care, Sleeping, Household and family care, Food management, Gardening and pet care, Shopping and services, Leisure, social and associative life, Entertainment and culture, Resting, Sports, Computing, Hobbies, Reading others, Travel
Not significant	Eating, Household management, Participatory activities, Visiting Feasts, Other social activities, Walking and hiking, Reading books, TV, Radio and music

Source: own calculation

The difference between the two clusters can be analyzed with the value of final cluster centers regarding to selected, significant variables. We can realize that the elder people of the first cluster spent less time on personal care, sleep and family care, but they have more time on leisure, social and associative life and related travel. They spent more time on sport and outdoor activities, reading (except books), too. Other activities, such eating, running the household, caring the pets, walking the dog, shopping, walking and hiking have or TV and radio habits do not have any significant differences in the two groups.

It is interesting that there is a significant difference in sleeping. Climatic reasons probably matter here, just think of the siesta of the Mediterranean countries.

Elderly people in Southern and Central Europe take part more actively in family care than Western and Northern Europe which can caused by economic and cultural factors. In return, they have less time on leisure, social and associative activities, sport and other outdoor activities.

We argue that the significant differences in habits may influence the health issues, quality of life and well-being of elderly people. The measure of these effects is not the subject of our study.

Conclusion

We analyzed the European time use survey to find patterns in elder age groups' habits and way of living. By cluster analysis we could create two clear groups for time use in the Northern and the Eastern-Southern part of Europe. The most significant differences occurred in social participatory, family care and activeness. These factors originate from cultural traditions and economic status. A common purpose for European countries could be increasing the social inclusion and the activeness to have mentally and physically healthy pension life perspective.

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SESSION 2: LABOUR MARKET

Determinants of the Sustainability of Pension Systems in the V4 Countries

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Abstract

In this paper, we expand on our earlier results published in Németh et al. (2019) about the sustainability of the Hungarian public pension system, and extend the scope of our analysis to the Visegrád countries of Czechia, Hungary, Poland and Slovakia, while shifting the end of our forecasting horizon from 2050 up to 2100. We look at past trends, commonalities and differences among fertility, mortality and employment rates in the region, and use Eurostat data to forecast the economic old-age dependency ratios of the countries. We conclude that the future of the four pension systems is strongly determined by past demographic events, and all systems face a serious threat in the long run, which might not be completely relieved by parametric reforms.

Keywords: pension, sustainability, demography, employment, V4 countries

Introduction

The quality of pension systems is an important determinant of the well-being of employees (or in general: citizens) of a country. One of the most important factors that describe the quality of a pension system is its sustainability. A simple way to assess sustainability is by examining the long-term path of the so-called *economic old-age dependency ratio*, i.e. the

ratio of the elderly and employed populations.[32] In an earlier article (Németh et al., 2019) we presented calculations regarding the expected path of this ratio in Hungary in the period of 2017–2050.

As a next step, we now extend our analysis in two dimensions. First, **we use a longer forecast period**, and examine what can be expected in the second half of the 21st century, as well, i.e. the timespan of our current analysis is 2018–2010.[33] Secondly, instead of concentrating only on Hungary, **we widen our scope and take a look at the so-called Visegrád countries** (or simply V4): *Czechia*, *Hungary*, *Poland*, and *Slovakia*. These countries show a significant amount of similarity regarding their economic and social structures, i.e., they can be considered a natural comparison group.

In our model, we use a simplified approach to sustainability: we concentrate on the number of people in the contribution paying and benefit recipient groups, instead of including cash-flows in the model, which would require a more sophisticated approach. The next section briefly describes the most important demographic and labour market characteristics of the countries. Then we describe the model we used to forecast the old-age dependency ratio and discuss the results.

Demographics and Labour Market in the V4 Countries

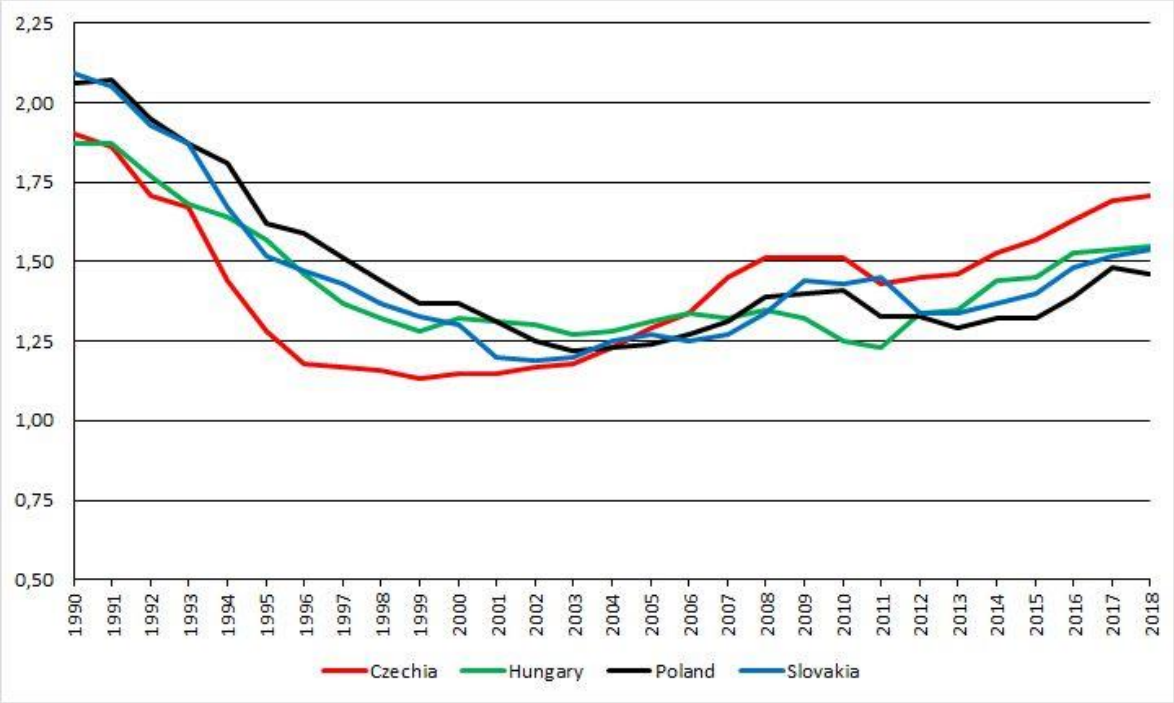
Demographic trends have a strong impact on the sustainability of a pay-as-you-go pension system. Ageing societies face a significant challenge in this regard, as the declining number of children sooner or later leads to fewer contribution payers, while increasing life expectancy increases the number of pensioners.

The number of live births is determined by two factors: on the one hand by fertility, and on the other by the size of the female population in reproductive age (15 to 49 years). We measure fertility by the *total fertility rate* (TFR), which quantifies how many children

[32] There is an important difference between the *demographic* old-age dependency ratio (frequently simply called old-age dependency ratio) and the *economic* old-age dependency ratio: the former puts the working-age population in the denominator, while the latter uses the employed population there. That is, the economic old-age dependency ratio takes into account the effects of changes in employment.
[33] We start our forecast period with 2018, because it is the last year for which we have a full set of the necessary data.

an average woman will have, if she has the given year's age-specific fertility rates[34] through her potential childbearing years. TFR decreased drastically in the '90s in the region, while the trend reversed around 2000, and TFR was on an increasing path until the financial crisis. As we can see it on *Figure 1*, there was a temporary decline in the TFR in all countries around 2010, but it has significantly increased since then. As a consequence of these changes – together with the trends in the size of the female population in reproductive age –, **the *number of live births* dropped strongly in the 1990s, and since 2000, it has increased significantly in Czechia, while remaining fairly stable in the other three countries**.

Figure 1. Total Fertility Rates in the V4 Countries (1990–2018)



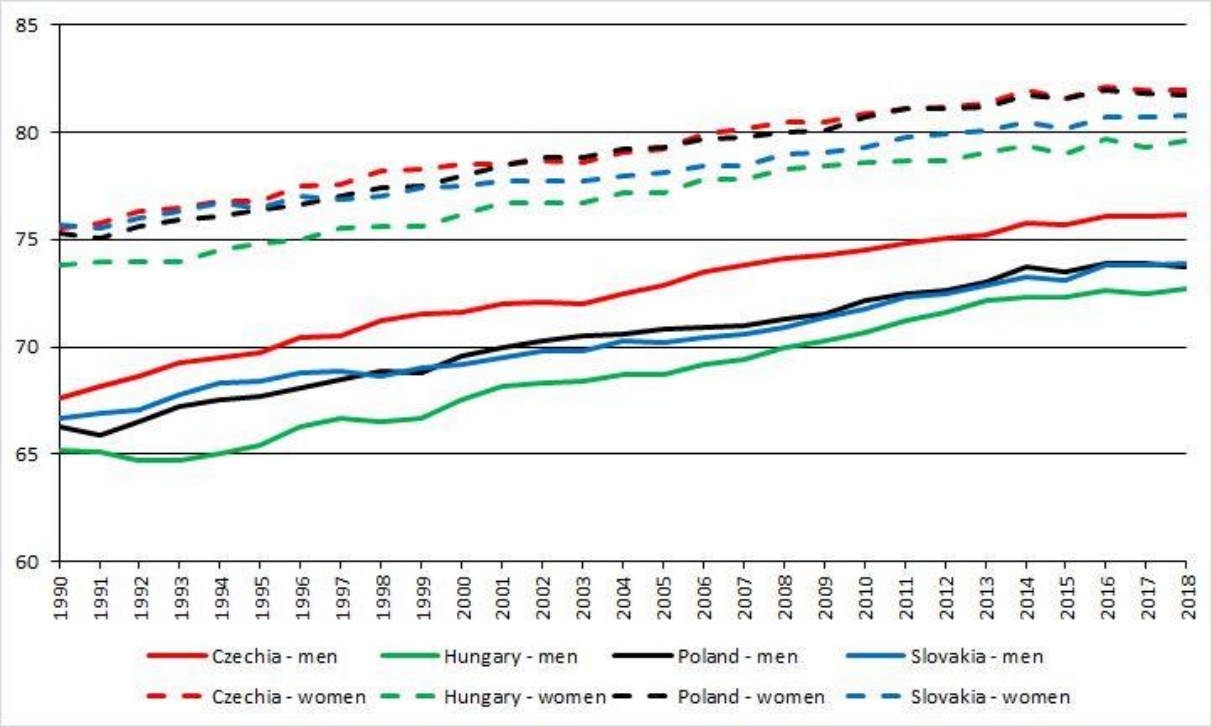
Source: Authors' plot based on data from Eurostat (2020)

Longevity is another strong determinant of the sustainability of public pension systems: as *life expectancy* tends to rise in the long run, so does the size of the pension-aged population. As *Figure 2* shows, **both female and male life expectancies at birth have increased continuously since 1990 in all four analysed countries**, although

[34] Age-specific fertility rates (ASFR) show the number of live births per 1000 women in a specific age in a calendar year.

expected lifespans of the region's individuals are still significantly below the EU averages. It is also worth mentioning that even the lowest female life expectancy in the region (Hungary) is more than three years higher than the highest male expected lifespan (Czechia).

Figure 2. Life Expectancy in the V4 Countries (1990–2018)

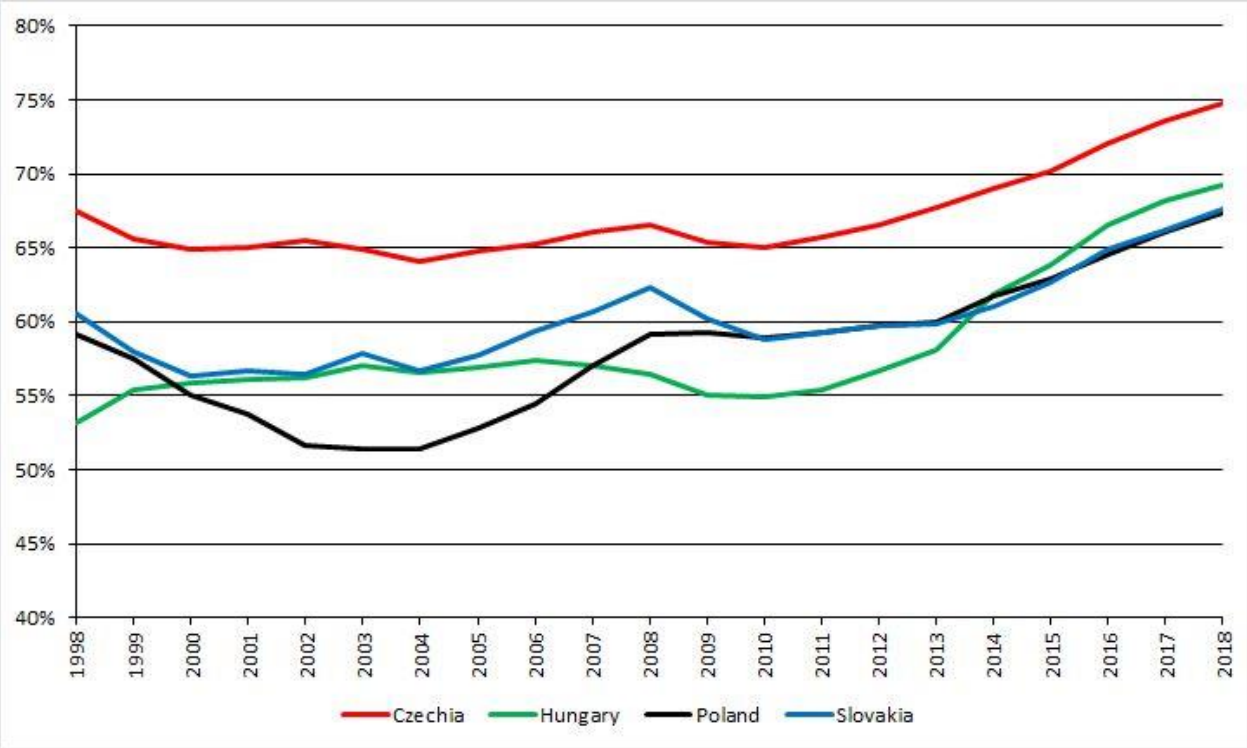


Source: Authors' plot based on data from Eurostat (2020)

All Central and Eastern European countries went through a transformational recession after the regime transition (Kornai, 1994). This recession had a serious impact on the labour market, as well; all affected countries witnessed a large decline in employment. As it can be seen on *Figure 3*, although there are significant differences in the exact paths of *employment rates*, employment in 2008 was very close to its 1998 level in all four countries. Naturally, the financial crisis affected employment negatively, but since 2010, all analysed countries have witnessed a solid growth in employment rates: 14.3 percentage points in Hungary, 9.8 percentage points in Czechia, 8.8 percentage points in Slovakia, and 8.5 percentage points in Poland. All these growth rates are much higher than that of the EU average (4.4 percentage points); as a result, **Czechia and**

Hungary currently have significantly higher employment rates than the European average, while Poland and Slovakia have also practically caught up to that average.

Figure 3. Employment Rates of People Aged 15–64 in the V4 Countries (1998–2018)



Source: Authors' graph based on data from Eurostat (2020)

The Economic Old-Age Dependency Ratio in the V4 Countries

Our model calculates the *expected path of the economic old-age dependency ratio* in the period between 2018 and 2100. We calculate a baseline scenario for each country, using similar assumptions.[35] We concentrate on three main determining factors: fertility, mortality, and employment. This means that, following Bajkó et al. (2015), we implicitly assume net migration to be zero.

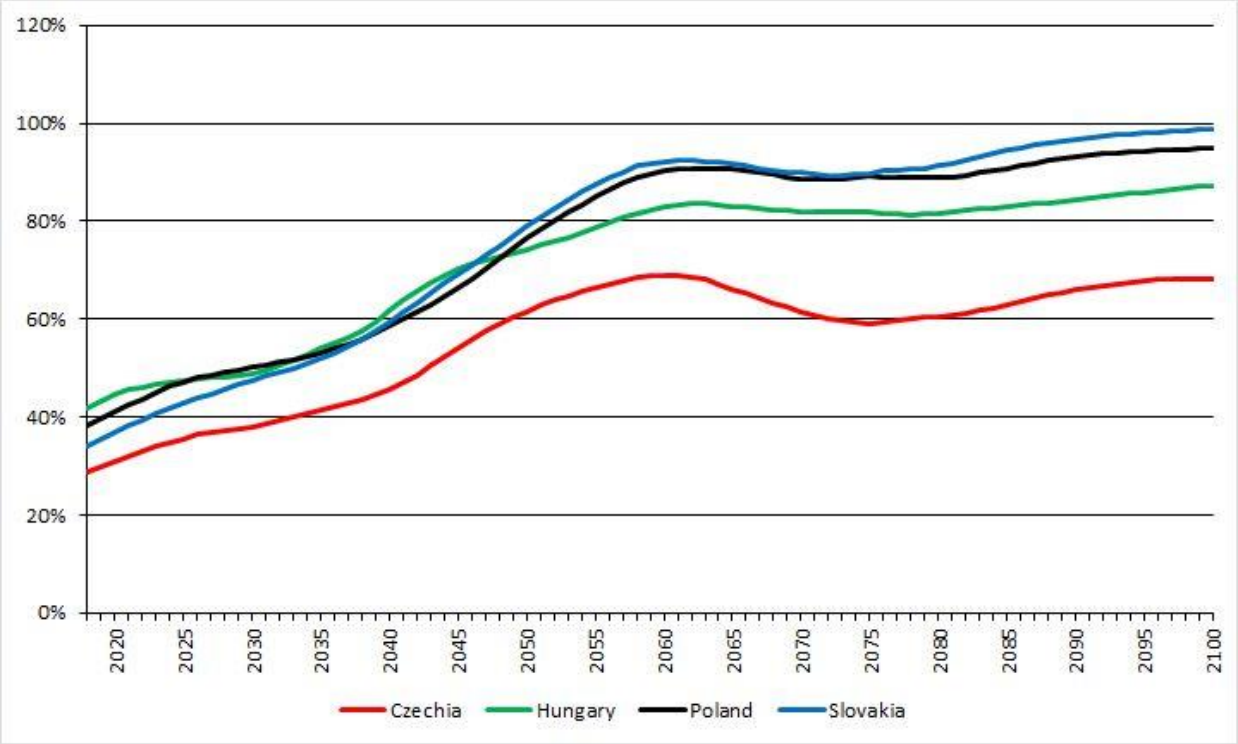
Regarding fertility and mortality rates, we use the assumed rates of the population projections of Eurostat (2020). In the case of employment, we could see an important trend in the recent period: the employment rates of the population aged 50–65 years has

[35] In Németh et al. (2019), we also described alternative scenarios for Hungary. As a next step of our research, we are going to make similar alternative assumptions regarding the V4 countries, as well.

increased significantly relative to the younger generations. In our baseline forecast, we assume that this trend will continue in the coming years, as well. More precisely, we assume that the employment rate of the 50–55 age group will catch up to that of the population aged 45–50 by 2030, and the employment of the 55–60 and 60–65 age groups will also reach a certain percentage of it in the same time period. These exact percentages differ among countries and genders, based on the witnessed tendencies of the last decade. Regarding other generations, we assume that the current (2018) employment rates will remain constant.

As the economic old-age dependency ratio is calculated as the ratio of elderly people (pension recipients) to the employed population, we have to make an assumption about the retirement age, as well. For the sake of simplicity, we use 65 years for all countries, although there are slight differences in the actual retirement ages. It is fairly certain that retirement ages have to be increased in most countries in the next decades, but in the calculation, we assume them to be constant, because we would like to forecast what could be expected based on current tendencies.

Figure 4. The projected paths of the economic old-age dependency ratio in the V4 countries



Source: Authors' Calculation

Figure 4 shows our results. **We can see a similar pattern in all four countries: the dependency ratio can be expected to significantly increase until 2060 (from 28.6% to 68.9% in Czechia, from 41.9% to 83.0% in Hungary, from 38.2% to 90.2% in Poland, and from 34.2% to 92.2% in Slovakia). This means that all the pension systems in the region face a huge sustainability challenge in the foreseeable future**. Even in Hungary, where the expected rate of growth is the most moderate, we can expect a doubling of the dependency ratio, and the situation is even more serious in the other three countries.[36]

Between 2060 and 2080, the dependency ratio is expected to decrease, starting to increase again only in the last two decades of the century (at a more moderate rate than in the first decades of the forecast period). This is due to the fact that the number of

[36] Although the absolute value of the dependency ratio is lower in Czechia than in Hungary, its expected rate of growth is higher.

childbirths dropped harshly in the years after 1990, and these much smaller generations will reach retirement age around 2060. That is, after that we can expect a significant decrease in the number of pensioners.

Conclusion

Our simplified forecasts show that there is a huge amount of determination in the system – mainly as a result of past demographic trends. We have experienced that the increasing trend of the economic old-age dependency ratio depends mainly on the number of live births. Different policy interventions such as increasing contribution rates, increasing the retirement age, etc. can decrease the growth rate of this ratio, but are not able to counterbalance its basic trend, as we can see in the case of Hungary in Németh et al. (2019). According to our results, the number of live births has significant long-run effects and consequences for the economy. We must pay attention to these long-run effects also while considering family policy interventions.

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The potential of atypical work

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Prior to March 2020 the labour shortage was a limiting factor in economic growth in Hungary. One of the possible ways to handle the shortage of labour is to invite the workers who are inactive due to their life situation to the labour market. To achieve this goal, it is important to apply flexible forms of employment. Also, atypical work can support work-life balance. Despite the advantages of atypical employment, its application rate is quite low in Hungary. In the IT programming and development sector only the 0,4% of job ads were telework, which increased to 8.6% in two months due to the pandemic. According to IT experts, the main obstacles to the spread of telework is the managerial attitude, the mistrust. A “forced telework” can help reduce mistrust and can increase the rate of teleworking in the long run if the employees consider the developed system fair.

Keywords: telework, atypical work, IT sector

Introduction

Prior to March 2020, one of the most serious problems of the Hungarian economy was the labour shortage. One of the possible ways to handle the shortage of labour is to invite the workers to the labour market who are inactive due to their life situation. To achieve this goal, it is important to apply flexible forms of employment. Also, atypical work can support work-life balance. Despite the advantages of atypical employment, its application rate was quite unpopular in Hungary. In 2018 the average rate of part-time employment was 16,6% in the EU. The OECD average was 16.5%. The highest proportions were observed in the Netherlands (37,3%). In Hungary, the rate was 3.8%, which was one of the lowest in the European Union and among OECD countries as well. (OECD 2018) The

situation was a bit better with regard to the use of flexible working hours. According to the 2019 Competitiveness Survey half of the companies applied flexible working hours. (Chikán et. al 2019) The coronavirus pandemic had a significant impact on both the global economy and ways of employment in April 2020. Teleworking has become mandatory in several jobs. In many cases, this was forced by government measures as well. Our original research question, which was looking for the reason for the low rate of atypical work in Hungary, has slightly changed due to the emergency situation caused by the epidemic. As the possibility of atypical work, including telework, is limited by the nature of the job, our research has focused on one area (the IT sector) where the majority of jobs have the technical potential for teleworking. As a first step, in February 2020, we reviewed job offers in the IT programming and development sector. We then contacted some IT professionals who already had telecommuting experience before the coronavirus pandemic and whose opinions could also contribute to a healthy balance of introducing telework after the virus situation.

Differences between countries and regions

Many authors have studied the differences in the employment rate of atypical work in different regions. On the one hand, the reason for the differences can be that the governments' unique welfare state regimes, political, legal and economic institutions are decisive. On the other hand, cultural factors have a very important role as well. Masuda et al. 2012, found significant differences in the managerial attitude between the individualistic (i.e. Anglo) countries and the collectivistic (i.e. Asian and Latin American) countries. While the managers in the Anglo cluster were satisfied with the offered flexible work arrangements, the managers in Asian countries could interpret the availability of telework as lower commitment to the employer.

According to the Hofstede dimensions, Hungary, like the Netherlands, belongs to individualistic societies, so the individualist-collectivist difference does not explain the lower rate of atypical work in Hungary. In comparison between Hungary and the Netherlands, the biggest difference is in "masculinity". Societies with a feminine feature have higher rates of atypical forms of employment. Another characteristic is that

“uncertainty avoidance” is very typical in Hungary, which can be an obstacle to the widespread use of telework.

Advantages of teleworking

Telecommuting can have a positive impact on the work-life balance, increases job autonomy, means flexible working hours, reduces or eliminates commuting time, reduces environmental costs. The earlier studies showed that the availability of flexible work arrangements is positively related to job satisfaction. If the employees are satisfied and committed to the employer, the lower absentee rates, the increased retention will reduce the employment-related costs. It can have positive outcomes such as improved productivity, organizational loyalty and belonging, job satisfaction, and employee retention and attraction. Using telework, employers can recruit people who chose to live outside major urban centers. (Literature review see Masuda et al. 2012, Hunton–Norman 2010, Baukeym D. E.-Kurland N. B. 2002)

Disadvantages of teleworking

Gajendran and Harrison’s (2007) showed a negative relationship between telecommuting and the quality of co-worker relationships. Isolation can reduce the ability of both the managers and the employees to coordinate work and act as a team in telework settings. The MSPB (2011) survey (see Mahler 2012) pointed out that telework could hinder teamwork, collaboration and interpersonal relations. As telework is generally viewed as a positive work benefit by employees, not being allowed to telework may be perceived as inequitable treatment. This may lead to diminished levels of satisfaction and a lower level of desire to remain in the organization. Dahlstrom (2013) emphasized the importance of fairness, how the employees perceive and evaluate the system. Hunton-Norman (2010) pointed out that however the most popular telework strategy among the employees was working exclusively at home, this type did not improve organizational commitment relative to a control group. The study found that the organizational commitment was significantly

higher when employees were allowed to choose between working at home or in the downtown office.

With a focus on the IT sector

At the start of the research (February 20, 2020) less than 4% of the vacancies were part-time jobs (in line with OECD statistics) and the proportion of the advertised telework jobs was 0.2% at profession.hu, which is Hungary's largest recruiting portal. Since teleworking cannot be applied to all positions, we chose a special area, the IT programming and development sector for a deeper analysis. Only 0,4% of job ads were part-time jobs and telework in this sector. During February and April 2020, we contacted five IT specialists, who had significant experience in teleworking. They were 51 years of age on average. In the meantime, the coronavirus disease has become a pandemic and the government has introduced serious measures. As a result of the economic stagnation, on 4 April 2020 the number of job vacancies advertised on profession.hu fell by more than half compared to 20 February. The proportion of vacancies advertised in telework increased ninefold, to 3.3% of all job advertisements. There was a 36% decrease in the number of job advertisements in the IT programming and development sector. The number of jobs advertised in telework became twelve times higher, accounting for 8.6% of all jobs, which is a significant increase from the previous 0.4%.

The consultations with IT professionals confirmed the conclusions of the statistics and previous surveys. Flexible working hours were available in most workplaces, but part-time work was very rare in Hungary. The opportunity for telework was already available in many IT jobs before the coronavirus epidemic but the workers typically spent only one day a week or a few days a month telecommuting. The very low rate of telework in job advertisements does not mean that it was not used by companies in the IT field but that a particular job was not advertised as a teleworking position, even if some teleworking possibility was later provided. Because of the restrictions, many employees have been forced to work in a home office. Based on the experience gained in the state of emergency, we also extended our investigation to future possibilities and suggestions.

Before the state of emergency, the biggest benefits of telecommuting were considered saving time spent on commuting, flexible working hours, work-life balance and the possibility of in-depth work. The lack of direct collegial connections was seen as the biggest disadvantage of telecommuting. The other challenge was that time spent on work was difficult to separate from time spent on other at-home activities. The interviewed experts said that there was no problem with performance evaluation in this area. Because employee activity is not always directly visible, this increases the required reporting frequency. In the field of software development, using a task management system (e.g. JIRA), performance can be measured and tracked in the same way as in the workplace. For an experienced colleague, performance monitoring in case of telework can work well. To train or integrate a new employee is much more difficult in case of telework.

According to the experts interviewed, in most cases, due to the nature of the work, telework was not used. The other reason was the managerial attitude: managers were distrustful of telework.

Following the declaration of the state of emergency in April 2020, all of the experts interviewed worked in a home office. The frequency was every work day of the week in three cases, several days a week in two cases. As the respondents had already worked in telework, the telework system had been developed by their employer. A substantial increase in the proportion of telework was the only new condition. “Forced telecommuting” was tolerated relatively well after the initial shock but they missed the company of their colleagues. They kept in touch with their peers on a regular, daily basis via email and phone. Video conferencing was used with varying frequency. Teams, Slack, Skype programs were also used as communication channels. In the horizontal working relationship, the frequency of communication was considered adequate. Communication also covered personal areas.

The frequency of vertical communication was generally considered sufficient. The communication between the subordinate and the supervisor was generally assessed as good, it was a two-way communication, it contained positive feedback about the results achieved so far. The weakest area (though not everywhere) is that vertical communication did not include any personal information. Performance evaluation during telework was considered good. But it is more difficult to assess whether constructive criticisms have

been properly received by the other party. Compliance with working hours was not checked in four cases, in one case it was done through reporting. Working in a home office made a positive contribution to work-life balance. The biggest challenge remains the separation of time spent on work and at-home activities.

All respondents agreed that the current “forced teleworking” will help increase the rate of teleworking in the long run. Everyone believes that teleworking should be available to everyone where the job allows. An interesting result of the survey is that although everyone teleworked before and during the coronavirus epidemic and they had fundamentally good experience with telecommuting, workers would like to telecommute to different degrees in the future. Although all of the respondents have the opportunity to work remotely and no one has a problem with telecommuting, we cannot talk about large cultural differences since everyone has a different future preference for telecommuting.

One of the main obstacles to the future spread of telework is the managerial attitude, the mistrust. Where teleworking is possible, the challenge is what system they can set up. According to the interviewed professionals, the critical elements are the well-defined tasks with deadlines, two-way communication, creating an atmosphere of trust, objective performance measurement, proper feedback and clear regulation. Respondents did not consider continuous control to be so crucial.

Conclusions

Despite the advantages of atypical employment, the application rate was very low in Hungary before March 2020, lower than the EU average. The consultation with IT professionals confirmed that flexible working hours were available in most workplaces, part-time work was very rare, telework was available in many IT jobs, but the workers typically spent only a few days a month in telecommuting so this opportunity did not appear in job advertisements. The lack of direct collegial connections was considered the biggest disadvantage of telecommuting before and during the pandemic. Another challenge was the separation of time spent on work from at-home activities. All respondents agreed that the present “forced teleworking” will increase the rate of teleworking in the long run because the parties can eliminate the main obstacles to the spread of telework. The managerial attitude will change. Although everybody had positive experience with

teleworking, their preferences about the future are very different. It is important to note that different jobs can be performed as telework to a different extent. On the other hand, employees would like to use telework to a different extent. When designing any system, it is important to make sure if employees consider the system fair.

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Is an older woman disadvantaged compared to her younger peer when employers make hiring decisions? – An experimental study on the Hungarian job market

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Abstract

The first half of this paper argues that Hungary, similar to other European welfare states, needs older people to re-enter or stay on the job market due to the aging of the population and the increase in people's expected healthy years. Many people are staying on the job market longer, and many government programs are also focused on incentivizing older people to stay active. However, based on some results in the literature it seems that employers tend to prefer younger job applicants when making hiring decisions. This bias is most likely because potential employers do not believe that older applicants can acquire new skills that are required for the job. We conducted an experimental audit study to uncover potential biases against older applicants and our results seem to point in the direction that there is one. In our study we constructed fictitious CVs of two pairs of women, a younger and an older in each pair, and sent them out to apply for actual job postings. The first pair of fictional ladies applied for positions as economic analysts and the other two women as economic assistants. We observe that based on the responses to the applications, the older applicants had a lower acceptance rate. As for the differences in the two types of postings, we observed that the bias is stronger for the analysts than for the assistants. This might be due to the required qualifications for these jobs. We build a relatively simple toy model to quantify the bias.

Keywords: age discrimination, aging society, audit study, model of employer's behavior.

Introduction

In the 1900s in the US[37] it was common for ordinary men to be engaged in some income-generating work in their whole lives, meaning that older men often worked until their death. This is not true however, for women, as based on some social norms, in families with a high enough income, they were the ones who stayed home. According to Borjas and Van Ours (2010), 63.1% of the men older than 65 worked in 1900, while in 1990 this dropped to 16.3%. The situation was similar in the early 1900s in Europe as well, but in the last third of the 20th century in most of the welfare states of Europe the employment rate of the age groups above 55 and especially above 65 dropped even more than the one in the US. The rate started to increase only in the last fifteen years of the twentieth century, which was most likely caused by the aging of the population and the decrease of the share of younger people who take part in the economic value generating process (Eichhorst et al. 2014; Van Dalen, Henkens and Schippers 2009).

From now on, we mainly focus Europe and Hungary, but we try to keep the literature review as broad as possible. In almost all the European welfare states (including Hungary), governments were forced to change their pay-as-you-go pension systems as a response to the aging of their populations. This tendency will most likely continue in the future (Gruber and Wise 2005). The most common way governments are trying to solve the issues are the continuous increasing of the retirement age, the abolishment of early retirement, and the replacement of the system of defined benefits with the system of defined contributions. These methods have a so-called push effect and are complimented by the so-called pull effects. These effects are due to older people who want to re-enter or stay longer on the job market. Many older people decide to stay on the job market longer because they have a potential to live longer and in good health, or simply for other economic reasons, like to increase their income further (Hudák, Varga, and Várpalotai 2015). As Berde and Rigó (2019) point out, the pull effect is stronger if older people decide to stay on the job market voluntary and not by some law imposed on them by the government. Button (2019) estimates that the pull effect contributed more to older people's job market activity in the US, than the push effect, even if in retirement options are stricter and less favorable than those in Europe. In the OECD countries the motto live longer,

[37] There are detailed employment statistics in the literature for the US, but we were unable to find similar statistics for Europe. However, it is reasonable to assume that the European labor market is similar to the American one in the aspect mentioned.

work longer is becoming more and more popular, which includes the popularization of the positive aspects of the pull effects (Martin 2018; Vodopivec and Dolenc 2008).

In most European countries, the activity of older people on the job market is viewed in two different ways. Governments often try to increase the number of years citizens need to be working, but potential employers seem to have a preference towards younger employees. Our paper tries to show this latter in Hungary. In an issue of the Hungarian Central Statistical Office (KSH) from 6-7 years ago it was stated that „Delaying retirement seems controversial from the pure viewpoint of the labor market. The financial pressure on the pension system might be decreased by keeping the older generations on the job market, but in the period of economic stagnation, this might make it more difficult for younger people to enter the job market and thus becoming contributors to the system.„ (KSH 2013, 2. page last paragraph). This sentiment seems to be in contradiction with the findings of Gruber, Milligan, and Wise (2009), who showed that the presence of older people on the job market does not affect the job opportunities of younger people in a similar way as the increase in the employment of women did not affect the opportunities of men.

Our paper shows with the help of an experimental study that contrary to the reasoning of Gruber, Milligan, and Wise (2009) Hungarian employers seems to discriminate against older applicants. We crafted the CVs of two pairs of imaginary women, an older and a younger in each pair. We sent the CVs to actual job postings, in the case of the first pair for economic analyst positions, and for economic assistant positions for the second pair. According to our results, for both pairs, the older applicant seemed to receive fewer positive reactions. There also seemed to be a difference between the two job categories as well, the older applicant for the analyst position got the least positive feedback. We use the data to parametrize a simple model that helps us to quantify age discrimination under certain assumptions. With the help of the model we can explain that our results may be since positions where the acquisition of new skills is required age discrimination is more severe.

The paper is organized as follows. In Section 2 we compare the employment rate of the older age groups in Hungary with the average of the European Union and that of the total population. We also show the differences between the employment rate of men and women in Hungary. In Section 3 we discuss the theory behind testing discrimination on

the job market. In Section 4 we discuss the results of our experiment. In Section 5 we introduce our model and describe how we can quantify age discrimination based on our data. Finally, Section 6 concludes.

The employment of older people in Hungary

The employment rate of the age group 55-59 in Hungary was constantly increasing from 2002 until 2018. It even surpassed the average of the European Union in 2018. The increase in the employment rate was also high for the 60-64 age group. However, the employment rate of this oldest group is still far behind the average of the European Union. The rates are in Table 1.

Table 1. Employment rate of the working age population and the age groups 55-59 and 60-64 in EU28 and in Hungary.

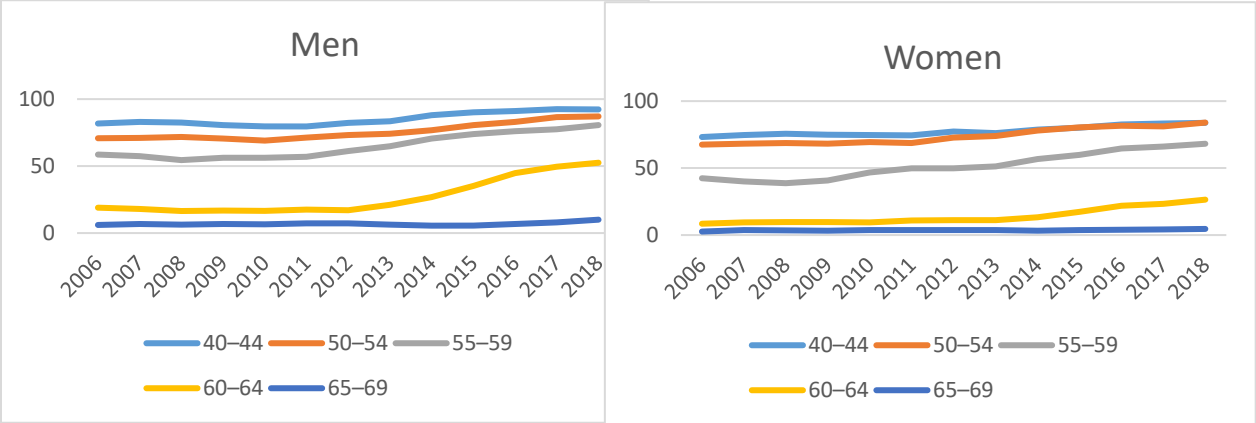
YEAR	EU 15-64 Years	Hungary 15-64 Years	EU 55-59 Years	Hungary 55-59 Years	EU 60-64 Years	Hungary 60-64 Years
2002	62.3	56.2	52.1	38.8	23.5	9.1
2003	62.6	57	53.5	44.3	24.9	11.1
2004	62.7	56.6	53.6	46	25.4	13.1
2005	63.3	56.9	54.8	48.6	26.7	14.6
2006	64.2	57.4	55.6	49.8	27.7	13.0
2007	65.2	57	57.1	48.0	29.0	13.2
2008	65.7	56.4	58.7	46	29.9	12.7
2009	64.4	55.0	59.7	47.9	30.2	12.8
2010	64.1	54.9	60.8	51.1	30.4	12.6
2011	64.2	55.4	62.3	53.2	31.3	13.9
2012	64.1	56.7	63.8	55.1	32.6	13.8
2013	64.1	58.1	64.7	57.7	34.4	15.5
2014	64.8	61.8	65.7	63.2	36.6	19.4
2015	65.6	63.9	67	66.4	38.3	25.4
2016	66.6	66.5	68.7	70	40.5	32.2
2017	67.6	68.2	70.3	71.5	42.5	35.2
2018	68.6	69.2	71.8	74	44.4	38.2

Source: Eurostat employment data (downloaded on 5 January 2020).

Table 1 shows that the employment rate of the age group 55-59 increased by 35.2 percentage points in Hungary between 2002 and 2018 and the rate of the age group 65-69 increased by 29.1 percentage points. The increase between 2006 and 2018 is shown

on Figure 1 for men and women separately and including age groups 40-44, 50-54, and 65-69.

Figure 1. The evolution of employment rates of the age groups 40-44, 50-54, 55-59, 60-64, and 65-69 in Hungary between 2006 and 2018.



Source: The electronic STADAT database of the Hungarian Central Statistical Office (downloaded on 25 January 2020).

Figure 1 shows the employment rate of the age group 40-44 because the employment rate of that age group was the highest for every year, so they can serve as a benchmark. Figure 1 clearly shows that by 2018 the employment rate of men aged 50-54 almost reached the employment rate of men aged 40-45, and for women the employment rate of the age group 50-54 was virtually the same as the employment rate of women aged 40-45. For almost all other age groups, especially in the case of women, the rates are way below the employment rate of the benchmark age group in 2018, even despite the increase. If we compare the employment rates of men and women, we can see that the employment rates of women were smaller for every age group. Button (2019) reports a similar trend on US employment rates. In his paper, a possible explanation for this trend based on hiring date is that older women might be facing an even stronger discrimination than older men on the job market.

As populations are aging in developed countries, a larger share of people above 60 will be required to be employed. According to an estimation of the Hungarian Central Statistical Office, the share of people aged 60-69 from the population of people aged 25-69 will reach its peak between 2040 and 2050, and it will be approximately 5-8 percentage

points larger than the current share (see the graphics and tables on https://www.ksh.hu/interaktiv/korfak/orszag.html, downloaded on 5 January 2020). As Button (2019) and Berde and Tőkés (2020) point out, older age groups tend to be employed in non-standard ways, compared to younger age groups. A possible explanation for this is that older people might find it more difficult to get a standard job.

Button (2019) shows that age discrimination both at the workplace and on job interviews is more severe for women than for men (see also Kurland 2001; Porter 2003; Walker et al. 2007). Hence, we also decided to focus our study on the hiring discrimination women are facing. In the following section we discuss the theory behind testing hiring discrimination, and in the section after that we introduce our experiment.

Testing for age discrimination in general

Testing for age discrimination has many difficulties. As Lovász and Simonovits (2018) point out, one of the most important obstacles is that researchers can rarely observe the real productivity of individuals and groups. Moreover, as Neumark and Song (2013) discuss, facts supporting age discrimination are seemingly much less convincing as those supporting gender or racial discrimination, even if age discrimination is an equally serious problem.

Methodologically, testing for age discrimination is not different from testing for racial or gender discrimination. Riach and Rich (1991), Bertrand and Mullainathan (2004), and Simonovits (2012) clearly show that sending out fictitious CVs is a common and internationally accepted method to test for some type of discrimination on the job market in the hiring process. The CVs should be constructed in a way that they are as similar as possible and only differ in the one trait the researchers are interested in. As the CVs are not real, this method necessarily seems deceitful, thus this type of investigation must be done with utmost care. The harm done on employers must be minimized. The goal of the investigation, which is to uncover some unjust actions towards certain groups, however, justifies this minimal harm on the employers. The first step of testing is usually the sending of CVs and cover letters if necessary. This part is usually called an audit study. Sometimes the first step is followed by a second one, where actual people are sent to the job

interviews (see for example Sik and Simonovits, 2009). This step requires more carefulness as the real identities of the people involved in the testing should remain unknown (Simonovits 2012).

In our study we only do the audit study part (first step), so we do not discuss potential problems arising in the second step. Fasbender and Wang (2017) argue that even this first step could be useful in uncovering some patterns and to gather useful data.

A crucial question is the homogenization of the CVs. The effectiveness of such a study heavily depends on the ability of capturing unobservable characteristics, such as potential work effectiveness and ability to learn ne skills and signal this with only one variable, the age of the candidate. The CVs must be as similar as possible and differ theoretically only in the ages of the candidates. However, this is an impossible task, as if a person is older, they have longer work experiences, different set of skills, and even similar skills might be interpreted differently. To solve this issue, we tried to keep skills and work experiences as close as possible, and whenever it was inevitable, we gave the slight advantage to the older candidates. This should make verifying our hypothesis more difficult.

Settings and results of our experiment

We made four hypothetical candidates, two older and two younger women, who applied for similar jobs. The first younger-older candidate pair applied for economic analyst positions, while the other pair for economic assistant positions. Within the pairs, the candidates had comparable work experience and educational levels, and all four candidates had children, the younger candidates had children attending kindergarten and elementary school. The older candidates had 6 years before they could retire. For the analysts, we mainly used LinkedIn to find postings and to send out applications, while for the assistants, we used the largest HR portals of Hungary to find vacancies.

We started looking and applying for postings in October 2019. We sent the crafted CVs of our hypothetical candidates and recorder as much as possible about the job postings. We gave phone and email correspondences and waited for replies. Table 2 summarizes the total number of applications sent per candidate and the number of positive responses. We

characterized a response as positive if the potential employers invited our candidates for interviews. In all cases we shut down the negotiations after this happened.

Table 2. Applications sent and positive responses.

	Applications sent	Positive responses
Young assistant	197	20
Old assistant	197	12
Offers coming from the same place for the assistants	2	
Young analyst	196	18
Old analyst	196	5
Offers coming from the same place for the analysts	3	

Source: Self edited

We realized that the older candidates were facing a more difficult situation when applying for jobs. In the case of the analyst positions, the older candidate barely got any positive feedbacks, while the younger candidate seemed to get much more. For the assistant positions, the difference is not as large, but the preference towards younger candidates is still visible. There are two main observations that can be made. First, it seems that the callback rates are higher for assistants. Second, the difference between the older and the younger applicants seems to be larger in case of the analysts.

Modelling the decision of the employers

In this section we construct describe a simple model to explain the patterns we see in our data and to potentially quantify the discrimination towards older people. The goal of the model is to give use the collected data in a way that gives us clearer picture about the discrimination.

The model has two types of actors: employers and potential employees, called candidates. A candidate has a skill level which describes how well-matched the candidate is for the type of job. This skill level is a summary of the skills and attributes of the candidate and with a massive simplification we assume it can be expressed with a single real number. Employers receive information about the candidate, for example based on the candidate's CV and cover letter, and have a pre-determined target skill level, above which they invite candidates for a job interview. From the candidate's point of view, as

there are many potential employers with unknown target levels each, we assume that the candidate effectively is facing a continuum of employers, distributed over a support (finite or otherwise) according to a given cumulative distribution function. Thus, when a candidate is applying for a job, the probability of getting an invitation for a job interview can be simply calculated as the probability that the target level of the employers is lower or equal to the skill level of the candidate.

Our experimental setting was based on several assumptions, one of which is that our constructed CVs signal similar, if not identical skill levels for our old and young candidates. This assumption is crucial in our comparative analysis. If this assumption were not met, we would not be able to meaningfully compare the callback rates for older and younger candidates. Thus, even in the theoretical framework, we make this assumption.

By using several cumulative distribution types (linear, inverted U-quadratic, chi-square, and triangular), we can quantify two measures for the discrimination. The first shows by how much the signaled skill level of the older candidate should be for her to receive a positive callback with the same probability as her younger counterpart. The other is similar, but with ratios. It tells us how many times the older candidate's signaled skilled level should be higher. By calculating these numbers for every distribution type, we find that, depending on the distribution itself, the older candidate needs to signal a higher skill level around 20-30% of the standard deviation of the distribution in both cases.

Concluding remarks

As the Hungarian population is aging, it is important to understand the role and possibilities of older people on the job market. In order to test and potentially quantify their possibilities, we conducted a field experiment on the Hungarian job market, where we compare the possibilities for hypothetical older and younger job applicants.

Our experiment is in line with the international literature and has all the advantages and disadvantages of discrimination testing. We tried to minimize potential harm on the employees by only following every application until the first round of replies (if any). We compared the results of two pairs of candidates, the first in an analyst position, the second

in an assistant position. Our results show that the callback rates for older applicants were smaller and the difference seems to be harsher for the analyst position.

We introduce a toy model to quantify the discrimination we measured with our experiment. The actual numbers depend on the choice of a distribution function, but irrespective of the shape of these functions, we find that older applicants need to signal a much higher skill level if they want to have the same acceptance rate as their younger counterparts.

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Workplace flexibility, employee wellbeing and the possible macroeconomic impacts

Cserháti Ilona

Abstract

It is frequently argued that more satisfied employees with better social relations at the workplace would be essential for the new economy. The paper gives a brief overview of the latest trends and tendencies regarding the new forms of employment with special regard to the job flexibility; possible advantages, unavoidable drawbacks and expected challenges are also presented. Measuring these developments in a reliable way is again of crucial importance. Therefore, the paper explores the possible ways of measuring flexibility at a workplace - based on official Hungarian and international datasets. The preliminary results of our own survey for measuring perceptions job flexibility are also presented. Hypotheses on relationships between workplace flexibility, employee well-being and economic performance require multidimensional micro-level modelling approach. The paper outlines a theoretical model for estimating these relationships. Finally, some data requirements are formulated that would be vital to analyse the relationship of employee wellbeing and long-term economic performance more trustworthily.

Keywords: workplace flexibility, employee well-being, remote work

Introduction

What makes you happy at the workplace? Could it be argued - based on quantitative evidence - that productivity would increase as a consequence of higher level of job satisfaction? If this hypothesis can be hold and that relationship is proved to be significantly positive (irrespectively of time and country) then it would be of crucial importance for economists, employers and governments to determine main drivers of employee wellbeing. The fact that more and people seek self-fulfilment not only in their

personal life but also in their professional carrier changes the expectations towards an “ideal workplace” and an “ideal job”.

This paper focuses on finding the main drivers of employee wellbeing in Hungary. The structure of the paper as follows. In section II a brief literature review is given regarding remote work and work flexibility in general, in section III the available datasets and analysis of the recent trends is shown, while in section IV the main results of our own survey are presented and finally in section V some conclusions are drawn and some further research plans are presented.

Literature review

Olson (1983) raised a question of a new phenomenon, namely remote office work or telework. She projected in 1983 that the office automation technology would change the way we work, i.e. many office workers would become potential telecommuters. The employees (who had already worked from home) were found to be highly self-motivated and self-disciplined. Olson suggested organizations to give more options in space and time to their employees to get increased motivation and productivity.

Bell (2012) took part in a remote work research project through the Cornell Center for Advanced Human Resource Studies (CAHRS) in the ILR School at Cornell University. In the research interviews were conducted with nine CAHRS partner companies (including Aetna, Citigroup, Cisco Systems, General Mills, and IBM) in order to identify the strategies and practices companies have developed to manage their remote workers. The main findings of this research were the followings:

- senior leadership support is proved to be essential for cultural acceptance of remote work,
- personal and professional isolation is a higher risk since less face-to-face interaction occurs,
- only high quality direct leadership can lead to a better performance of remote employees and to a higher level of job satisfaction.

IBM (2014) had a research (based on WorkTrends survey) about remote working from the full-time employee perspective. They had some findings:

The numbers teleworking at least one day per week have remained remarkably consistent for Anglo-Saxon countries between 2008 and 2013 at around 9 percent. Australia had a 2 percentage point jump in 2013, the largest increase in the Anglo-Saxon countries group.

- The higher up the career ladder, the more likely you are to telework.
- Workers in the high-tech industry are more than three times as likely to telework as those in the government.
- Teleworkers are more highly engaged, more likely to consider their workplaces as innovative, happier about their job prospects and less stressed than their more traditional, office-bound colleagues. One of the most commonly discussed benefits of flexible work arrangements is improved work-life balance.
- Remote work is not suitable for every type of job; construction workers will likely always need to be on the construction site and retail associates in their stores. However, a lot of jobs are suitable for remote work and in future, the number of remote workplace will likely continue to increase.
- Poorly prepared managers do not promote often the remote work. Training organized them how to manage and lead remote employees is important to overcome barriers of the success of teleworking. Leadership needs to actively create an organizational culture that supports telework.

Fernandez - Marrauld (2017) analysed the design of a virtualized platform and focused also on the remote working management. They proposed three options:

- The remote worker works exclusive at home, uses a desk in his/her flat. His or her work is under control by the ICT (information and communication technology) because instant massages allow the verification that the home workers are really behind the computer.
- The remote worker works sometimes at home. The ICT devices allow one to contact them at any time even he/she is not available.
- The remote worker works in a co-working space or telecentre: he/she has a high degree of autonomy of organizing of his/her work.

Felsted-Golo (2017) found some evidence of remote work based on statistical data. The data of Labour Force Survey (LFS) and Skills Surveys of United Kingdom replicate that

remote working has been growing among 20-59 year olds who are in work. The proportion working at least one day a week away from the conventional workplace grew by 4 percentage points from 13.3 per cent in 1997 to 17.1 percent in 2014.

According to Olubunmi et al. (2017), “migration in the twenty-first century is the movement of mindpower, not simply bodies”. The World Economic Forum’s Global Future Council on the Future of Migration has a project, namely Mobile Minds. The aim of the project is to promote global prosperity to support global remote work. The authors recognize that a globalized world requires a globalized labour market, and that the coming decades will only bring more need for solutions like remote work.
Expected benefits of remote work for employers the real estate cost savings and the improved worker productivity mainly as a consequence of fewer distractions from colleagues, a quieter work environment and no commuting time. They state that remote work could have positive impacts also on the whole society by reducing unemployment in economically underdeveloped areas, improving gender equality, decreasing the environmental footprint.

Choudhury et al. (2019) analyse the effects of the WFA (“work -from-anywhere”) program on productivity of at the United States Patent and Trademark Office. While traditional “work-from-home (WFH)” programs offer the worker temporal flexibility, “work-from-anywhere (WFA)” programs offer both temporal and geographic flexibility. The authors found that the output under WFA increased a 4.4 % in comparison to WFH. The provided evidence also shows that WFA examiners relocate to lower cost-of-living conditions.

The available quantitative information and analysis of recent developments

Measuring job flexibility - stance of remote work internationally –The Zapier survey

The most recent international survey about the state of remote work was conducted by Zapier in 2019 (a fully distributed team of 300 employees working from 27 countries)

asking nearly 2,500 remote workers to get their opinion and experience about the benefits and struggles that come with remote work and also to get some information on the structure of their remote companies. Almost half of respondents (1180 people) lived in the United States, followed by Canada and United Kingdom (6-6%). This survey was conducted online among ages 18 and older who primarily used the computer for doing the job can be considered as knowledge workers.

The main conclusions were as follows.

From the viewpoint of employees:

1. Remote work is proved to be very attractive: great majority (99%) of the respondents would like to work remotely. So people from all over the world want to work remote!
2. A flexible schedule proved to be the biggest benefit to remote work (40% argued that), but other characteristics (working from any location, more time with family and working from home) can be also important drivers going remote. So providing job flexibility is of crucial importance to increase job satisfaction.
3. Unplugging from their work, loneliness (isolation) and struggling with communication are the main problems when you work remotely, but distractions at home or staying motivated can also become a significant issue sometimes. It means you have to be prepared for the negative consequence and have to have your own or your company's strategy to handle them.
4. Location flexibility is very important. However, 84% of respondents use their own home as their primary workspace, i.e. remote work is not only for young digital nomads for discovering the world on a low budget anymore. You can work from safety of your home and work for anywhere.
5. One fourth of people think that commuting can be considered as the most stressful part of an office job.

From the viewpoint of employers:

1. 91% of business owners stated that they had always intended to support remote work.
2. Regarding status of respondents' companies: 31% of firms work as a fully remote company, 40% follows the partially remote and partially office based set up (they have both remote and in-office workers), while 25% of companies provides some home office opportunities and the rest 4% runs a solo business.
3. It was a bit surprising that in spite the fact that remote companies save money on office space and facilities, the majority of companies does not pay for the costs related to remote work, such as home internet or co-working membership. It highlights the role government, the role of decent regulation.

All in all, majority of the respondents thinks that the traditional office work will disappear by 2030. So it would be of vital importance for both governments and firms to be prepared for this changes; with implementing new regulations, new types of leadership and elaborating human resource policies helping employees also to get ready for these new requirements.

The Hungarian case: recent trends regarding job flexibility in Hungary

In Hungary there are no regular data services regarding remote work and measuring job flexibility yet. But in 2018 a supplementary survey was conducted by the HCSO (Hungarian Central Statistical Office) titled "Remote work and home office". At about 20 thousand employees were asked about their job characteristics. The main findings were as follows based on Table 1 and Table 2.

1. Only 144 thousand employees (3.7%) worked in remote form in Hungary in 2018.
2. It seems promising that there are no remarkable gender gap regarding remote work opportunities in Hungary.
3. Remote work is the most widespread (6.1%) in the age group of 35-39 years of age. It can highlight a very important opportunity for policy makers: developing remote environment, providing remote options for mothers with small children could

become a perfect choice for the family and it can contribute to the increasing of employment rate in Hungary.

4. Remote work is much more available for knowledge workers (7.9%) than for blue collar employees (only 0.5%).
5. The more educated you are the more remote option you have in the remote market: while the remote ratio is extremely low for people with primary education, those with tertiary one it almost reaches 10% (among men it is 12.4%). 69% of remote worker has tertiary education.

Table 1: Ratio of remote workers by demographic characteristics (15-74 years, %)

	Working remote		
	Male	Female	Total
Sum	3.8%	3.7%	3.7%
By age group			
15–24	2.1%	1.9%	2.0%
25–29	3.4%	4.3%	3.8%
30–34	4.8%	4.7%	4.7%
35–39	6.0%	6.2%	6.1%
40–44	4.6%	3.3%	4.0%
45–49	3.8%	2.5%	3.1%
50–54	2.9%	3.5%	3.2%
55–59	1.3%	3.1%	2.2%
60–64	2.3%	1.7%	2.1%
65–74	4.4%	6.0%	5.3%

Source: HCSO, LFS (Labour Fource Survey),
supplementary survey, first quarter of 2018 and own calculations

Table 2: Ratio of remote workers by highest educational attainment (15-74 years, %)

Male	Female	Male	Total
Primary	0.6%	0.4%	0.5%
Secondary, without high school diploma	0.4%	0.4%	0.4%
Secondary, with high school diploma	2.8%	3.1%	3.0%
Tertiary education	12.4%	7.5%	9.7%

Source: HCSO, LFS, supplementary survey,
first quarter of 2018 and own calculations

Table 3 presents some interesting characteristics of remote work regarding the place of work.

It can be seen that majority (89.1%) use their home as a primary workspace – and do not work from the other side of the world or from coffee shops or from other co-working spaces. The ratio is extremely high for young people (91.3%). All these facts suggest that Hungarians would love to stay and work in Hungary with their friends and family if they feel that they can get a decent job and work for a brighter future.

Table 3: Primary workspace of remote employees in Hungary, %

	Working from home	Working from somewhere else	Total
Total	**89.1%**	**10.9%**	**100%**
Mail	86.9%	13.1%	100%
Female	91.7%	8.3%	100%
By age group			
15–24	72.1%	27.9%	100%
25–39	91.3%	8.7%	100%
40–54	88.0%	12.0%	100%
55–74	89.6%	10.4%	100%

Source: HCSO, LFS, supplementary survey, first quarter of 2018 and own calculations

From macroeconomic point of view, it would be also essential to provide flexible remote options for the younger generations to stay in Hungary to stay even in the region where they were born.

It can be seen based on information of Table 4 that immigration is not always proved to be the optimal selection. More than two third of young Hungarians working abroad do jobs under their qualification. It means that a decent remote offer according to their qualifications might help them to think about returning home, decreasing brain drain, increasing the domestic human resources and labour force.

Table 4: Job experience of young Hungarians (15-29 years old) working abroad

	Do jobs according to their qualifications	Do jobs under their qualification	Do anything that comes in their way	Sum
Mail	32.0%	36.8%	31.2%	100%
Female	21.0%	54.8%	24.2%	100%
Sum	27.7%	43.7%	28.5%	100%

Source: HCSO, LFS, supplementary survey, fourth quarter of 2018 and own calculations

Results based of our own survey: perception of students and role of flexibility in their future jobs – the Hungarian perspective

The best way to be prepared for the future labour market challenges to ask younger generation about their visions, perceptions and expectations about the future of work. For this purpose, an online survey was conducted among university students in the framework of the ”EFOP-3.6.2-16-2017-00017 – Sustainable, intelligent and inclusive regional and city models” project.

The survey contains 103 questions in 8 dimensions (personal issues, study, work experience, job environment, work abroad, job flexibility, carrier targets, subjective

wellbeing). The Hungarian sample size is 417 (out of which 253 were female). The international version of the questionnaire is still currently in progress.

This paper focuses only on results of the job flexibility section.

Majority of the respondents (75%) has already had some work experience. At about 43% of them was able to get a job closely connected to their future profession. For 63% of students the duration of their job was longer than 6 months.

Measuring job flexibility, I would like to highlight four survey questions.

Regarding the first question about opinions about new forms of employment we got a bit surprising results (Table 5): whilst part time job and platform work proved to be less attractive and a bit more "independence-oriented" new forms of jobs (such as remote work or launching out on an own startup) proved to be highly supported by the respondents.

Table 5: Which new forms of employment are the most attractive at your job selection?

Atypical forms of job	Interested
1. Locally independent	55.4%
2. Launch out on a startup	53.5%
3. Remote work	45.6%
3. Part time job	33.3%
4. Platform work	26.9%

Source: calculations based on own survey

The second question was about time requirement for home office in their future jobs. Home office (even if you have a traditional office job) is getting more and more accepted and well-known recently in Hungary. It can be seen in Table 6 that two third of students says that at least one day a week would be needed to be satisfied with their job and save their work-life balance. It can be evaluated as a responsible and moderate position.

Table 6: How much time would be needed for home office?

Not necessary	A few hours in a week	One day a week	More than one day a week
22,8%	9.9%	39.7%	27.6%

Source: calculations based on own survey

The third question was about the required level of flexibility by the students (Table 7). It turned out that less than 15% of respondents strive to achieve full flexibility, but majority wants it at least to some degree.

Table 7: What type of time schedule do you think is the best for you?

Fixed time	9.9%
Flexible at some extent	75.9%
Fully flexible	14.2%

Source: calculations based on own survey

It is also important to add that almost 90% stated that flexibility of their job would be a great help when they decide to have children.

The fourth question was about spatial flexibility of the respondents (Table 8). It is a bit frightening that almost half of the students are considering to go abroad to have a job. On the other hand, it is good to have well-educated young experts who are able to find a job in the global labour market. Whilst international flexibility can be regarded as very high, domestic flexibility is very low: almost half of the respondents is not willing to move only settlements nearby or not at all. Remote work could be a solution for both groups: some people could work from home for the local market, others can work globally but locally independent. It could avert the brain-drain crisis and also could help brain-gain for less developed region in Hungary.

Table 8: Are you flexible regarding your place of work?

Not at all	15.4%
Only settlements nearby	28.9%
Only in Hungary	13.0%
Out of country, as well	42.6%

Source: calculations based on own survey

Our results regarding perceptions about job flexibility can be summarized as follows.

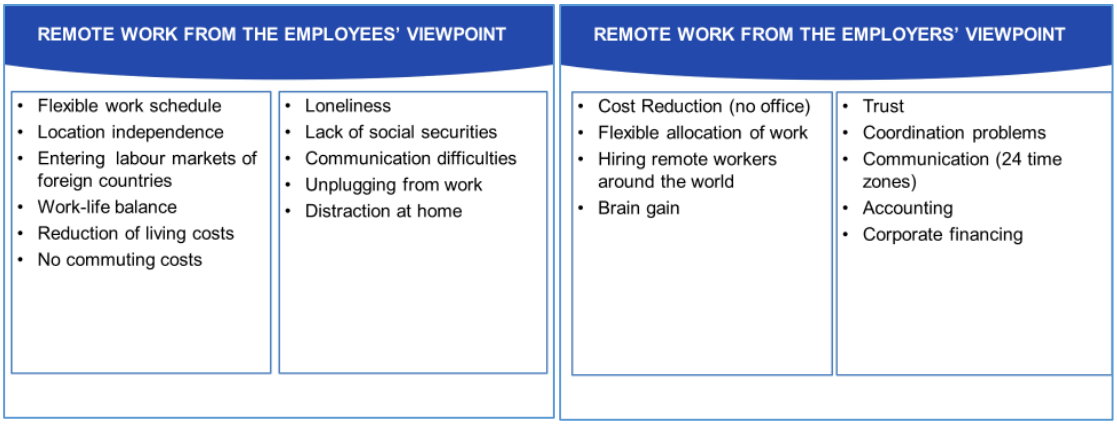
1. Regarding atypical jobs students prefer jobs with higher level of independence (own start-ups, remote jobs, etc.) to only time flexible ones (part time jobs).
2. For traditional office jobs the flexibility (home office options) is also getting more and more important.
3. Overall job flexibility becomes of vital importance when having children.
4. Spatial flexibility (domestic and international) is proved to be a contradictory issue: half of the students would like to maverick but the other half would not move anywhere – or just nearby.

Overviewing the recent trends for remote work and job flexibility it can be stated that remote work is probable not just a fashionable recent trend. It can stay here permanently, for a longer period of time and it could become the norm for some sectors by 2030. The importance of traditional office jobs tends to decrease. It seems that there is room for remote work expansion in Hungary, as well.

Multidimensional flexibility seems to be one of the key drivers of job satisfaction, mainly for knowledge workers. A flexible schedule proved to be the biggest benefit to remote work. Location flexibility is also important, but 84% - 89% of respondents (in Zapier (2019) and in HCSO (2018) survey) would like to use their own home as their primary workspace, i.e. going remote at home.

Remote work is much more available for people with tertiary education. Offering good flexible job options for the young generation emigration, brain-drain and further aging problems could be diminished.

Figure 1: Pros and cons regarding remote work from different viewpoints



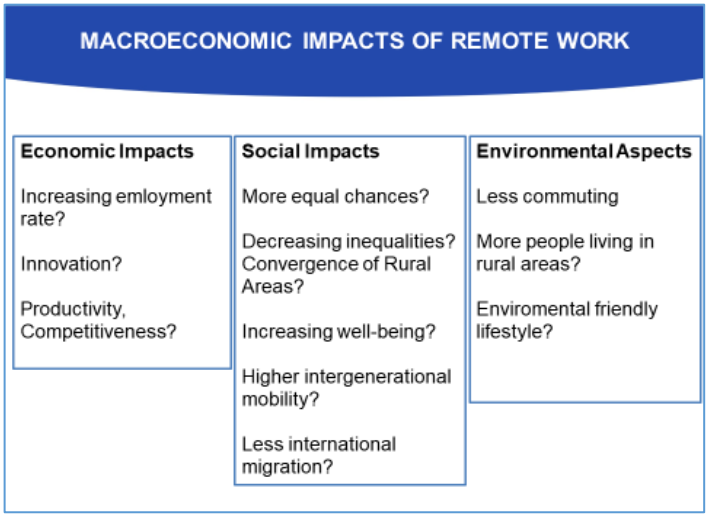
Source: results of own research

There are pros and cons for this new form of employment (Figure 1) both from the employers' and employees' viewpoint, but if one implements and regulates these types of activity effectively it can also have enormous benefits in the fields of job creation and economic growth.

Conclusions and further research plans

The main conclusion of the paper that measuring flexibility is of vital importance. Different dimensions regarding job flexibility were detected: flexible time schedule, spatial and location flexibility and the level of independence at work. It would be essential to get regular statistical data on these areas by the official statistical services. The next step would be to determine the main divers of job satisfaction. Next to the flexibility dimension safety (both in income term and in the traditional job security sense) and smartness (interesting job, development opportunities, etc.) dimensions could be estimated.

Figure 2: Theoretical impact assessment of remote work



Source: results of own research

By help of measuring flexibility safety and smartness also the employee wellbeing could be projected. It could give us the opportunity to model the macroeconomic impacts of remote work and or employee wellbeing in general. I firmly believe that these types of impact assessments could contribute to help people, business owners and policy makers to develop both the mind-set and the skills required in order to increase economic growth on one hand, and having a much better lifestyle in this new world, on the other.

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SESSION 3: WELL-BEING

The demographic dividend in Uzbekistan. What should we learn from the South Korean case?

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Abstract

Uzbekistan is currently on a crossroads in terms of economic, demographic and technological progress. The positive economic effects of the first demographic dividend can still be felt, however, it is already visible that this advantage will soon diminish. Investment for economic stimulation and human capital can establish further economic growth and welfare. The main question is whether Uzbekistan's economy can use this opportunity. To predict the future economic path taken by Uzbekistan, it can prove beneficial to compare critical stages of its economic path to that of other countries already in the aging stage. This paper compares the demographic development path of the Republic of Korea and Uzbekistan. It is shown that well planned and relevant demographic policies can boost economic growth in developing countries which are in the first demographic dividend stage. These examples could serve as valuable lessons for the Uzbek economy, and other similar countries as well.

Keywords: demographic dividend, economic growth, age structural transition, education, employment

Introduction

Most developed countries are facing the problem of ageing, while in developing countries the working-age population is increasing due to the decline of the fertility rate, which provides an opportunity for a demographic dividend. Uzbekistan is one of the countries that currently goes through a demographic transition with decreasing fertility and mortality rates over the last three decades. However, it seems that this window opportunity might

soon be closed. In order to exploit this demographic opportunity, it is beneficial to learn from some East Asian countries' valuable experience. Although there is no universal formula for exploiting the demographic dividend, Uzbekistan can adapt their experience in developing its model for tackling the problem of high skilled labor shortage and the high level of immigration due to unemployment. Among the East Asian countries South Korea is a prime example for boosting its demographic dividend. In the early 1960's Korea had a low economic development and its per capita income was 100$ while its population growth was 3% annually. This caused problems such as unemployment, job shortage, and poverty up to the point where almost 40% of the whole population suffered from poverty (Kim, 1991). However, through proper economic planning the country could increase its per capita GDP to 26761$ by 2018 (adjusted to constant 2010 price levels, US$), which is 28 times higher than in 1960 (World bank, 2020), and shifted from a poor agrarian country to an industrial high-income country (Lee&Lee, 2013).

The demographic dividend occurs when the share of the working age population increases, while fertility and mortality rates decrease. The first demographic dividend (DD) is used, when the share of the working age population (WAP, people aged 15 to 64) is increasing in the total population. An increase in the WAP results in the decrease of the child dependency (ChDR, the ratio of people aged 0-14 and the working age population) and old age dependency ratios (the ratio of people aged 65+ and the working age population). A smaller number of children per household generally leads to larger investments per child (Joshi & Schultz, 2007, Turbat 2017) and family welfare, provides more freedom for women to enter the formal workforce (Bailey, 2006), which later leads to an increased income (Lee&Mason, 2006) and labor supply per capita (Bloom et al., 2009) and more household savings for old age (UNFPA, Gupta, 2014). The latter is known as one of the components of the so-called second demographic dividend (Lee&Mason, 2006, Cruz&Ahmed, 2018). It can provide a further source for growth for a country once the first demographic dividend has already been exploited. Going back to the first demographic dividend it is proven in several studies that there is a positive relationship between the increasing share of the working-age population and GDP per capita growth (table 1). In the table below we summarize some of the most important papers dealing with this relationship, using econometric models. In the first column the reference of the papers are given, the second column contains the most important demographic variable

in the model influencing GDP growth, the third column shows the level of the GDP growth, and the last column contains the demographic area for which calculations were done.

Table 1: Demographic Dividend: contribution to growth in GDP

Study	Main variable in the model influencing GDP growth	Actual growth in GDP	Demographic area
Bloom and Williamson (1998)	the share of working age population	an increase of 1.4–2 % points in the GDP growth rate	East Asian countries (1965-1990 years)
Bloom et al., (2004)	the share of working age population	an increase by 1.4 % points in income per capita growth	A panel of countries observed every 10 years over 1960–90
Kelley and Schmidt (2005)	youth dependency ratio	an increase by 20 % of per capita output growth	South America, Europe and Asian countries (1960-1995 years)
Maliszewska et al., (2016)	the share of working-age population	an increase by 0.5 to 0.8 % points in annual GDP per capita growth	In pre- and early-dividend countries over 2015–2030 years given the right enabling conditions
Cruz and Ahmed (2018)	the share of working age population	an increase by in 1.6% points in GDP per capita growth	180 countries (1950- 2010 years)

Source: Author's' collection from the cited papers

In this paper, we present a few possible development paths and the potential of this development in the context of the demographic changes in Uzbekistan. Uzbekistan is compared with the Republic of Korea (further we simply write Korea), as these two countries have many historic similarities. Since both countries were formerly part of an empire or an empire-like country, and both had very high fertility rates, similar family traditions and role of women in the society (Chang, 2003), which are common starting points. Korea has achieved remarkable economic growth, and in terms of its main economic and demographic indicators, present-day Uzbekistan resembles Korea of the early 1980s. In this way, Uzbekistan has an excellent example when planning its future economic path, which if followed properly, would greatly accelerate Uzbekistan's economic development. Of course, Uzbekistan should also learn by avoiding the pitfalls Korea has failed to avoid when following the path of demographic dividends.

General conditions of demographic development of Uzbekistan

Today, Uzbekistan is the most densely populated country in Central Asia with a population of 33 million, which makes up almost half of the total population in the region. Before gaining independence from the Soviet Union in 1990, the total population of Uzbekistan was 20.5 million, which increased by 60% in 2018. In the 1990-2018 period, the average annual population growth rate in Uzbekistan decreased from 2.8-3.0% to 1.2-1.3%, mainly due to the fluctuation of the birth rates, but the difference between the number newly born babies and deaths in the population was always positive. The number of active people (aged 15-64) grew from 10.1 million to 18.8 million from 1991 to 2018 (World bank, 2020). Currently, the demographic situation of the republic is characterized by a moderately expanded population growth, which is due to the impact of the entire system of economic and social relations, as well as a change in the reproductive behavior of the population. Due to the growth of urban population and the increasing mean age of marriage, the total fertility rate of the country fell from 4.1 births per woman in 1991 to 2.4 births in 2018. Besides, infant mortality rate went down and reached 19.1 infant deaths per 1000 live births, while it was 59.3 in 1991. Obviously, with a higher standard of living and improved medical services and nutrition, such a declining trend was also observed in other mortality indicators, such as crude death rate and the mortality rate of children under 5. Accordingly, life expectancy at birth showed positive trend, it was 66.4 years in 1991, but became 71.3 years in 2018 (World bank, 2020).

All these tendencies have caused the share of children in the population to fall and the share of the working-age population to rise, mainly due to the high birth rate in past years. The proportion of children (aged 0-15) decreased from 43.2% in 1991 to 30.1% in 2018. A decline in the fertility rates is usually accompanied by demographic ageing, however this is currently still almost invisible in Uzbekistan. The share of the retirement age population increased slightly (7.6% in 1991 to 9.4% in 2017), therefore the median age of population is also increasing. As a result, the share of the working age population (aged 15-64) had an increasing trend and in 2017 this ratio was 60.5% (World bank, 2020). The growing number of working age people puts a pressure on the job market, but due to the shortage of jobs the total number of unemployed people is increasing, especially it is higher among younger people. In 1991 youth unemployment was 3.48% which reached 9.72% in 2018. Unfortunately, the educational level of younger people does not meet the demand of the labor market because of limited accessibility to higher education. This has

a negative effect on the country's development. Korea faced a very similar problem with low capacity of higher education at the beginning of 1980's (Schmid, 2013).

Comparing the demographic and economic development of Uzbekistan and Korea

To predict the future economic path of Uzbekistan, it is beneficial to compare the critical stages of the economic and demographic development path of the Korean economy, which is now entering the aging stage, to the Uzbek economy. Analyzing economic indicators of both countries allow us to draw the conclusion that Uzbekistan's current economic condition resembles Korea's indicators after the Asian crisis of 1997. Korea developed quickly before the crisis. The average growth rate of real GDP between 1981 and 1996 was 9.3%, which fell to 3.7% during the 2003-2014 period (Whang et. al, 2015). The Korean development path was so impressive that as result Korea was recharacterized as a developed country (Lee&Lee, 2013). Uzbekistan's average annual GDP growth rate was 8% from 2005 until 2015 (Malikov et.el, 2016). In both countries agriculture was the dominant sector and the service sector was undeveloped. In Korea during the 1960's the share of the service sector in GDP was 39.4 % and in Uzbekistan 39.3 %. This distribution completely changed in Korea in 2018 with 1.98% for agriculture and 53.56% for services (World bank, 2020). Uzbekistan's GDP distribution across economic sectors in 1991 was 37% for agriculture and 26.5% for services, which changed only slightly in 2017 with 17.9% for agriculture and 48.5% for services (World bank, 2020). Uzbekistan still has a high dependency on agriculture. The structure of an economy influences how employment is shared across the sectors, which changed dramatically in Korea. Agriculture had 58.4% of the total employment in 1965, and only 5% in 2018, whereas in the service sector the share more than doubled with 31.2% in 1965 and 70.4% in 2018 (Lee&Lee, 2013, World bank, 2020). There is no visible change in Uzbekistan, in 2018 33.6% of all employees still worked in agriculture. Similar employment shares were observed in Korea in the 1980's.

The comparison of the main demographic indicators showed that nowadays Uzbekistan's conditions are like those of Korea in the 1970-1980 period. In 1971 the total

population of Korea was almost 33 million with a 1.8% population growth. This is almost identical to Uzbekistan's population growth in 2018. A similar pattern can be seen on the two countries' fertility rates. In Korea in the 1960s, the fertility rate was 6.1 children per woman and decreased rapidly by 1982 to 2.39 children and this decline continued until today. The fertility rate in Korea in 2018 was 1.05, while Uzbekistan's fertility rate in the same year was 2.45, however it is expected to fall further (UNICEF, 2018). Korea had a decrease in infant mortality rate, from 36.5 infant per 1,000 live births in 1975 to 2.7 in 2018. While, in Uzbekistan the infant mortality rate was still higher, 19.1 infant in 2018. In Korea during the 1970-1995 period the share of people aged 15-64 grew by 2.5% yearly on average, which decreased to 0.6% in the 1996-2010 period, with an expectation to decrease further in the future decreasing the share of the working age population (UNICEF, 2018).

The working age population in Uzbekistan was 18.12 million in 2018 and it is still expected to increase further. An increase in the number of the active population (aged 15-64) puts pressure on the government to create new jobs, otherwise this boom can end up in social problems. In Korea, the government supported youth entrepreneurship and gave them simpler credits deals. As a result, 28.8% of the total Korean workforce was self-employed in 2010 and most of them were small business owners (Lee&Lee, 2013). Moreover, the number of poor people[38] decreased from 40.9% in 1965 to 5.1% in 1987 (Kim, 1991). One main reason for the decrease in poverty in Korea is the increase in the education level of the people. The Korean case shows how education could exploit the opportunity provided by the first demographic dividend.

In Uzbekistan despite positive changes have been made to improve education, there are challenges that should be tackled. First, the low rate of participation of preschoolers to early childhood education. Despite by 2018 almost 30% of children had the chance to go to preschool, while it was only 25% in 2016 (UNICEF, 2020 and Stat Uzbekistan, 2020), it is still a very low number. It is noteworthy that in Korea kindergarten attendance increased during the rapid industrial growth in the 1970s as more labor force was needed. In the late 1980's many women participated in the labor force and the

[38] A person is defined poor it their cost of living per day was less than $1 according to the International Poverty Line, which is set by the World Bank but since 2015 the last update, it became $1.90 per day as the new global line.

enrollment rate in pre-school education increased (Lee & Cho 1977; Cho &Koo 1983). At the same time literacy grew from 30% in 1953 to 80% in 1963 and became one of the highest in the world by 1970 (Kim, 1991) in Korea.

In the meantime, the female labor force participation rate in Korea increased from 35.4% in 1964 to 43.1% in 1986 and to 52.7 in 2018. In Uzbekistan the female participation rate was a little higher 53.8% in 2018 (UNICEF, 2018) but this is more of a heritage from the Soviet era, and not a good indicator of effective use of human workforce, because in Uzbekistan women work mainly in less prestigious jobs, while in Korea females supposed to have higher positions more often.

In Uzbekistan, all girls have access to primary education, but this tendency does not keep up to tertiary education, contrary to the Korean practice. In Uzbekistan early marriage of girls is still typical, which hinders girls from entering higher education. Besides, not every girl can continue her studies at a higher educational institution due to higher costs. Only children from wealthy families can pay for extracurricular training courses which increase the chance of admittance to a university, while with the regular school curriculum and quality it is hard to be admitted to a university without paying the tuition fee. Wealthy families can afford the tuition fee, so their children have access to higher education even if they cannot obtain good results on the enrollment exam. The higher education coverage of school graduates in Uzbekistan (access to higher education) is still low, but this indicator has increased from 9% to 20% recently in 2018 and some further increase can be expected. As the Korean case shows, increasing enrollment in the higher education is inevitable for a country if it wants to use the window of opportunity of the first demographic dividend.

In Korea, the share of people with a tertiary education went up from 58% in 2008 to 68% in 2018, which is still the highest among OECD countries (OECD, 2019). As a result, highly educated people are overrepresented in the workforce of Korea, the share of employees with a tertiary education was 78% in 2018, while it was only 10-12% in Uzbekistan. So, a key ingredient in the Korean miracle were human recourses, especially workers having higher education, which could reap economic growth and equal the distribution of income (Lee&Lee, 2013).

We estimated the connection between GDP per capita growth and several demographic variables. The demographic variables used were the fertility and mortality

rates, share of the population aged 15-64, share of the population aged 65 and older, the share of urban population, the share of employees in the service sector, and school (primary and secondary) enrollment rate. The source of the data was World development indicators (2020). The analysis was conducted at an individual level, for the period between 1975 and 2018 for Korea and between 1991 and 2018 for Uzbekistan. We included data for Uzbekistan only after 1991 because that is the year when the country became independent from the USSR. A time-series regression method was used. Checking stationarity, we found variables were stationary on the first difference level. According to our regression in the case of Korea, the fertility rate and urban population have positive effect on GDP, while others have negative. Especially the share of population aged 65 and higher reduces GDP rapidly, which indicated that Korea might face an aging problem soon. In the case of Uzbekistan school enrollment rate, the share of employees in the service sector and the share of population aged 15-65 affect GDP positively, while other variables have a negative effect. From the regression analysis it is clear that Uzbekistan can only benefit from the demographic dividend, if other changes will also happen. These changes must boost the development of human recourses, such as tertiary education enrollment rate, increase the share of urban population, and raise employment level in services.

Main priority actions for boosting growth: Lessons can be learnt from Korea

By analyzing the Korean example, we suggest the following beneficial actions: i) Investing in human capital. Uzbekistan should invest more in education and increase its highly skilled labor force. ii) Gender equity could boost more effective production. By the help of appropriate policies women must be encouraged to get better education and professional skills. iii) Forming and implementing adequate economic plans could help the government to direct the country on a path with a stable economic growth. The path towards a higher economic level must include: iv) Establishing strong infrastructure. v) Reducing unemployment, creating jobs in manufacturing and service sectors. vi)

Flourishing the proper environment for new investments. vii) Attracting foreign direct investment to the country and improving its balance of trade.

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Country-level ESG indicators as Predictors of Social Well-Being?

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Abstract

Environmental, social and governance aspects are collectively known as ESG factors, which have gained significant importance in finance recently. This paper focuses on uncovering the predictive power of country-level ESG indicators to detect improved living standards. We applied Principal Component Analysis on the database of global ESG indicators provided by the World Bank, to establish an ESG well-being index. The implications of the results are obvious: this ESG well-being index would help to assess the determinants of well-being and to reveal the areas of improvement of the social care and pension benefit system.

Keywords: ESG factors, Principal Component Analysis, social well-being, living conditions

Introduction

Environmental, social and governance aspects are collectively known as ESG factors, which have gained significant importance in finance recently. According to MSCI ESG Research (MSCI, 2016), these are special performance indicators that measure the sustainability and societal impact of an investment. ESG factors and ratings are applied to both corporates as well as countries, similarly to credit ratings. These ESG factors provide investors with insight when assessing a country's long-term credit risk and evaluating sovereign bonds, sub-sovereign bonds, and government-related enterprises. With these new insights investors and researchers can have a better understanding of inherent long-term risks both from a values-based and an economic perspective. (Comble et al., 2019) In this paper, we focus on uncovering the predictive power of country-level

ESG indicators in the field of social well-being. The literature introduces several definitions of well-being and various approaches to its measurement. Prescott-Allen (2001) differentiated ecological and human well-being as he established a complex well-being index. He argued that the usual well-being indices, such as the HDI index of the United Nations or WHO-5 index, do not account for both human and ecological characteristics at the same time. In this paper, we target establishing a well-being index using ESG indicators. ESG is a dominant aspect in economics today, so this could be a novel and comprehensive framework for interpreting well-being. Under this concept we take into account both human and ecological characteristics. Then, we evaluate if it has a strong correlation with economic performance indicators and whether the index is as suitable for elderly well-being evaluation, similar to the HDI index.

Literature review

Country-level ESG factors is a widely researched topic. In the researches of Crifo et al. (2017) econometric analysis of the relationship between ESG performance and government bond spreads was applied for 23 OECD countries over the 2007-2012 period. Their results showed that high ESG ratings are associated with low borrowing costs and the impact of ESG ratings on the cost of sovereign borrowing is more pronounced in bonds of shorter maturities. Capelle-Blancard et al. (2016) examined the extent to which ESG performance can affect sovereign bond spreads. They observed that countries with good ESG performance tend to have less default risk and thus lower bond spreads. In addition, they found that the economic impact is stronger in the long run, suggesting that ESG performance is a long-lasting phenomenon. They also examined the financial impact of separate ESG dimensions: the results suggested that the environmental dimension appears to have no financial impact whereas governance weighs more than social factors. In their work they used a standard panel model to create an ESG index using Principal Component Analysis. Tarmuji et al. (2016) examined the impact of ESG practices on economic performance. In their research, they examined non-financial data from two countries (Malaysia and Singapore) for the period of 2010–2014. The results of their work showed, that social and governance practices significantly influence economic performance. In their study they used descriptive statistics, correlation analysis, and linear regression to analyze data.

Data and methodology

In our research, we used the database of global ESG indicators provided by the World Bank. (World Bank, 2020 a) The original database of the World Bank consists of 68 ESG indicators for 239 countries and country groups. For analysis, we selected six variables from the ESG indicators, based on the pillars of the well-being of Prescott-Allen (2001) and relevant literature of country-level ESG factors (Capelle-Blancard et al., 2016). These variables included GDP per capita; control of corruption; the proportion of seats held by women in national parliaments (%); PM2.5 air pollution measured as mean annual exposure (micrograms per cubic meter); the prevalence of overweight (% of adults); and scientific and technical journal articles (pc). Our research covers 174 countries for the single year of 2016. For the hypothesis testing we used further data form the World Bank database. (World Bank, 2020 b)

The applied methodology was Principal Component Analysis (PCA), based on the research of Nicoletti et al. (1999) and correlation analysis (Tarmuji et al., 2016).

Results

As a first step, we created an ESG well-being index with PCA, then we tested, if this new index correlates with economic performance indicators and if it is as suitable for elderly well-being evaluation, similar to the widely-used HDI index. HDI index is weighted by social variables and takes into account only social and governance factors, while ESG well- being index is weighted by governance variables and counts with environmental factors as well.

ESG well-being index

For PCA, firstly we evaluated the model conditions. The KMO value was 0,683, which was above the 0,5 limit, Bartlett’s test was rejected and the diagonals of the anti-image correlation matrix were above 0,5, so the selected database was optimal for Principal Component Analysis. After completing the analysis, based on the results we created the ESG well-being index.

Hypothesis

We tested two hypotheses using correlation analysis. In the case of Hypothesis 1, we examined the correlation between the well-being indices (our ESG-based well-being index and the HDI index) and the main economic indicators (annual inflation, GNI per capita, unemployment). The results of the correlation analysis show, that neither the ESG well-being index nor the HDI index had a strong correlation with economic performance, so we rejected the hypothesis, that the ESG well-being index had a strong correlation with economic performance indicators. In the case of Hypothesis 2, we examined the correlation between the well-being indices (ESG well-being index and the HDI index) and the population ages 65 and above (percentage of the total population). HDI index is the well-being index of the United Nations, and its components are the GDP per capita, life expectancy, and literacy rate/school enrollment. The results of the correlation analysis suggested, that there was a strong positive correlation between ESG well-being index and HDI index. Furthermore, both indices, the HDI index, and the ESG well-being index had a strong positive correlation between the population ages 65 and above, so we did not reject Hypothesis 2.

Summary

In our research we used country-level ESG indicators to determine social well-being. We applied Principal Component Analysis on the database of global ESG indicators provided by the World Bank and based on the results, we created an ESG well-being index. We tested this index, if it correlates with economic performance indicators and if it is suitable for well-being analysis similarly to the HDI index. Resultantly, it did not correlate strongly with economic performance indicators, so the application of this index in investment decision making is not obvious, for identifying possible implication, the investment strategies should be analyzed as well. Then, in the case of testing Hypothesis 2, it appeared that the ESG well-being index could be optimal for well-being analysis. This result may indicate that this index could reveal the determinants of retiree well-being and identify the development areas of the social care system.

This research has limitations. Firstly, robustness checks are required to further enhance reliability of results. Moreover, results are valid for only data for 2016, no general conclusion can be drawn from this analysis.

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Intersection of Elderly Employment and Tourism – Opportunities for proactively addressing the challenges brought by aging societies

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Abstract

The phenomenon of aging societies, marked by a dynamic increase in the proportion of elderly in the total population, represents major economic- and social challenges that cannot be ignored; and effectively addressing them requires comprehensive and proactive action plans and strategies. In addition to the action plans of countries and international organizations, there is a growing number of complex indicators aiming to measure the success of adaptation to this demographic change and to make it regionally comparable. However, in terms of aging-related indices, Hungary usually ranks in the second half of the field in any international comparison, which leaves ample room for improvement in dealing with the challenges brought by this aging of our society. The preliminary results of our research project are based on in-depth interviews with nineteen retired workers employed in various areas of tourism, and explore the relationship between the subjective well-being of elderly and their involvement in tourism on the

service provider side. Our results show that the abilities, skills and experience of these retired workers make them well-suited to the task of heritage interpretation, and that there is a link between being an employee in the supply side of tourism and the subjective well-being of older workers.

Keywords: subjective well-being, seniors, involvement in tourism, elderly employment

Introduction

The process of the aging of society, characterized by a dynamic increase in the proportion of elderly in the total population, is mainly due to three predominant trends: increasing life expectancy at birth, declining child mortality and declining fertility rates (UN 2017). The fact that people are living longer than ever can be seen as an achievement of our time, but also foresees severe economic- and social challenges (Kolos et al 2019; Turner 2011; Uhlenberg 2009) that must be effectively coped with not only by individuals themselves but also by the business- and public sectors and society as a whole (Galiana – Haseltine 2019). Therefore, there is an unprecedented need to pay special attention to initiatives and actions that are aiming to raise the well-being of the elderly. It is no wonder that more and more complex indicators have recently been published to measure and compare the effectiveness of countries in adapting to this dynamic demographic change. Although these indices are compiled with different methodologies and content, most of them, among many other factors and with different weightings, take into account self-reported subjective well-being (SWB) as a determinant of adaptability to successful aging (UNECE 2019; Goldman et al 2017; HelpAge 2015; Betts-Adams et al 2011). It is more than a meaningful fact that Hungary usually ranks in the back half of the field in any international comparison in terms of these indicators (UNECE 2019; Goldman et al 2017). Reflecting on this situation, the aim of our research is to explore the relationship between employing the elderly in the supply side of tourism and their subjective quality of life, i.e. well-being.

Literature review

However, there is still no agreement among researchers on the exact content of the concept of quality of life and on the optimal way to measure it (Costanza et al 2007; Diener et al 1999). It can be said that human quality of life is based on people's certain, objectively measurable living conditions (objective well-being - OWB), and their individually perceived satisfaction and subjective life-evaluation (subjective well-being - SWB) related to those conditions (Sirgy et al 2006). Thus, the level of subjective quality of life of individuals with similar, objectively measurable living conditions may differ widely. There is also a lack of consensus on the content and measurement of subjective well-being, though several different models have been created by researchers (Oswald – Wu 2010; Diener 1994). Whereas at the beginning of scientific subjective well-being research the findings of Wilson (1967) assumed a happy person – among other factors – to be undoubtedly young, by now it has been proven that the relationship between subjective well-being and age is far from clear and straightforward (Murinkó 2007). Several related studies have been conducted in different contexts and areas, some of which have found no relationship (Veenhoven 1996), some of which have shown a negative relationship (Koo et al 2004), and others that have shown a positive relationship (Horley – Lavery 1995). There have also been quite a number of research findings that consider the curve depicting the connection between age and well-being to be U-shaped (Blanchflower – Oswald 2001) or even inverted U-shaped (Xing – Huang 2014; Easterlin 2006). Several researchers pointed out that in Hungary the curve approximately follows an inverted U-shape (Kiss 2015; Murinkó 2007), which is a very unfavorable result from the point of view of the elderly. In reflection to this, while keeping an eye on the current demographic changes, it may be worthwhile to carry out further exploratory studies about the subjective well-being of elderly.

The question is therefore self-evident: what are the factors and what is their effect on the quality of life and subjective well-being of the elderly? Although answering this is a particularly complex task, as there is no commonly accepted recipe for the content and measurement of both general quality of life and subjective well-being, it is certain, however, that when focusing specifically on the elderly age group, some factors (such as

health, work / activity and social relationships / embeddedness) are much more important than in all other age groups (Walker 2005). For instance, older people have a higher perception of the importance of health for life satisfaction than younger ones (Schneider et al 2004), while the long-term negative effects of the lack of social relationships, and the resulting feeling of loneliness, are much more intense among the elderly than in other age groups (Yang – Victor 2015). Also, when it comes to spending one's leisure time and other activities, although some researchers do not find a clear connection between travel and subjective well-being of the tourists involved (McCabe et al. 2010), this relationship seems strong and clear when examining only a narrower segment of travelers, such as the elderly (Kim et al. 2015; Michalkó et al. 2008; Dann 2002), and the prominent role of work as an activity and lifelong learning in improving the quality of life of this age group has been confirmed by multiple studies (for example Galiana – Haseltine 2019; Walker 2005).

Research methodology

In our research, we aimed to explore the relationship between work and subjective well-being in the case of retired Hungarian employees working in the field of tourism. In order to fully understand what employment means for older people, what are the current practices, and what opportunities the Hungarian tourism industry holds in this regard, we used a very popular qualitative research method – the most expedient to explore and understand deeper connections – the in-depth interview. The need for storytelling is as old as mankind (Barthes 1975), so we can basically see man as a storyteller (MacIntyre 1981). Thus, the method of semi-structured in-depth interview is especially suitable for getting closer to deeply understanding the phenomenon we want to explore, and in order to answer our research question we need to hear the first-hand experiences of the examined group about their current work and its subjective meaning for each individual.

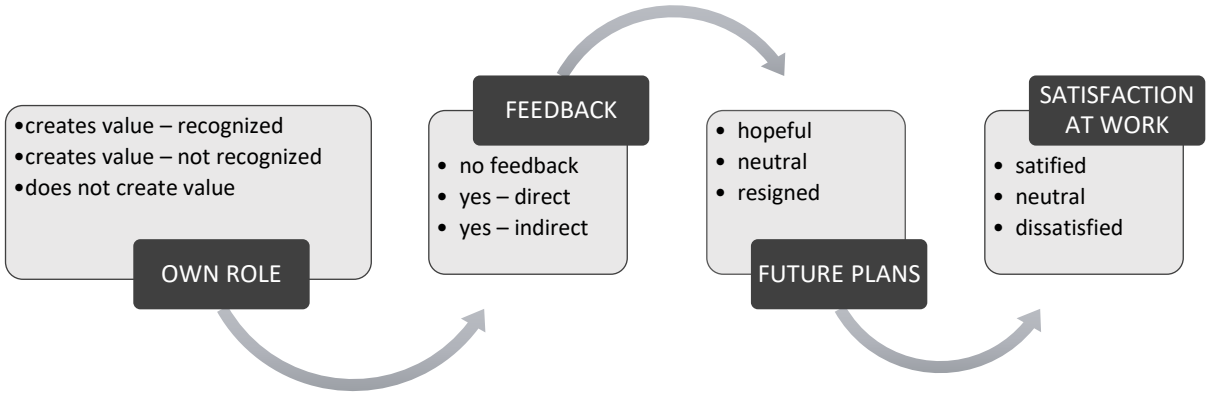
During the data collection, beginning in March 2017, we focused exclusively on the elderly who, according to the current Hungarian laws, qualify as retired based on their age or

length of employment. Thematic, semi-structured in-depth interviews with altogether 19 elderly employees were conducted in the Danube Museum of Esztergom (6 employees), in the Castle of Pécsvárad and in the Egg Museum of Zengővárkony (6 employees), in the Inner-City Mother Church of the Blessed Virgin in Budapest (6 employees) and in the Benkovics Guest House in Pilismarót (1 employee). These 19 subjects are employed as museum guards and -guides, a librarian, cashiers, maintenance staff and accommodation providers. The 60-90-minute interviews took place at the respondents' workplaces and included questions primarily about why they work, what their work means to them, and how they feel about their current job. Our thematic analysis of the transcripts of the interviews outlined four key emerging themes within which there are vast differences between the 19 retired workers. Then we examined the patterns emerging from each participant's narrations and compared the individual differences and similarities with the other 18 retired employees, based on which we attempted to divide the storytellers into well-separated typologies.

Results

Based on our thematic analysis of the 19 narratives, four key topics emerged as characteristic differences between the individual workers: their *own role*, the *work-related feedback*, the *job satisfaction*, and *future plans* (*Figure 1*). Subsequently, for each participant we observed their characteristic pattern and compared its similarities and differences with those of the other retired employees.

Figure 1: Characteristics identified along the four key emerging themes that are the basics of the differences among the retired employees working in tourism



Source: own editing (2019)

After the comparison of the individual patterns emerging from the narratives of each interviewee with all the other retired workers, the participants can be grouped into four well-differentiated groups, based on the:

- **type of work** they are appointed to do (which can be mostly *mental* or *physical*),
- their **contact with the visitors** (which is ether *direct*, *indirect*, or *none at all*),
- and the **nature of their daily tasks** (which are either related to *heritage conservation and/or interpretation* or mainly of an *operational* nature).

Out of the four groups, work is of the greatest pleasure to those who carry out intellectual activity in which they have direct contact with visitors, and the nature of their duties is primarily linked to the interpretation of heritage and transfer of knowledge, such as museum guides. They mostly talked about their work with statements such as "*I am aware that they are counting on me*" or "*this is a place where I can realize myself*", and therefore they see it as a kind of mission. Those who are predominantly engaged in intellectual activities but nonetheless either do not have any direct contact with visitors (such as the librarian) or have to deal with them solely in connection with operational duties (such as a cashier or accommodation provider), were typically emotionally neutral when discussing their jobs. Based on what they said, work neither explicitly delights them but nor they do associate any negative experiences with it. During the interviews, the "*at least I don't sit at home*" and the "*I'm good here, I don't have anything to do anyways*" were the most characteristic statements. Those who seem to be the least satisfied and have the least

pleasure in their work are employed in a position where they have to do mostly physical work and do not have any, or only occasional, random contact with visitors (for example the maintenance staff). They typically represented the attitude of "*I only do it for money*" and "*I can't wait for the day to pass*". According to their own perceptions, out of all the retired employees this group felt the most "invisible" at the workplace, and although they said they are aware of the value of their work, they were the ones who most missed positive feedback.

Thus, there is clearly a relationship between the subjective well-being of retired workers involved in the research and the characteristics listed above, although we do not claim that there is a causal relationship between them. It cannot be unequivocally claimed that some of the retired employees are more satisfied with their work, and feel valuable in their positions, because they have heritage presentation-related tasks in which they can pass on their knowledge to visitors with whom they come into direct contact, as the reverse may be true as well.

Conclusions and summary

Based on our research, there can be a clear connection between the level of subjective well-being of retired employees working in tourism and the work they do, if the nature of the task entrusted to them is related to heritage interpretation and knowledge transfer, and they have direct contact with visitors during their work. The ageing of society has now brought up the issue of (re-)employment of the ever-growing group of elderly, both due to the burden it imposes on the pension system and the issue of their social integration. The results of our three-year research project suggest that the skills, abilities and experience of elderly working in tourism-related workplaces make them particularly suitable for tasks of heritage interpretation and knowledge transfer; while these results may be of interest to tourism service providers when planning their human resources and the allocation of certain tasks. In the next phase of the research, we plan to conduct further in-depth interviews with other retired employees who are also working in tourism in order to fine-

tune our results. We have also begun to analyze the customer feedback in the guestbooks of the service providers, as these comments can be very instructive and a reflection of our previous research, which has been approached exclusively from the service provider's point of view. The results of this analysis will be published later.

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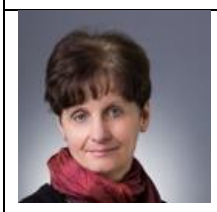
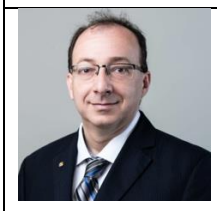
	Zsófia Kenesei is a Professor at the Marketing Department of Corvinus University of Budapest. Her researchinterests cover the fields of service marketing, consumer decision making and sevice economy.
	Krisztina Kolos is a Professor at the Marketing Department of Corvinus University of Budapest. She is an expert of service marketing research, and marketing strategy compilation.
	Gábor Michalkó is a Professor of Tourism at Corvinus University of Budapest and scientific advisor at the Geographical Institute of CSFK. He is head of the Doctoral School of Business and Management, and director general at Corvinus Doctoral School. He was awarded a PhD in Geography from University of Debrecen in 1998, and a DSc (academic Doctor of Sciences) from the Hungarian Academy of Sciences in 2009, for his contribution to tourism geography. His recent research interests include urban tourism, shopping tourism, health tourism, human ecology of tourism, and the relationship between tourism and quality of life.

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Corporate Social Performance and Financial Profitability

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Abstract

According to stakeholder theory, good corporate social performance (CSP) enhances financial profitability due to higher stakeholder satisfaction. Employees are critical stakeholders; therefore, better working conditions (e.g. smart working, equal opportunity for each demographic group, fair remuneration policy) increase their well-being which could result in higher productivity and profitability. Although we emphasise narrowly defined social performance, however, other closely related corporate factors such as environmental and governance policies are also discussed because of their general well-being effects. Taking all these into account, we use the “ESG” concept throughout the study. The analysis covers 2018 company-level data and performed on a sample of 1,099 firms from the MSCI ACWI Index. Regression calculations are based on the weighted least squares (WLS) method. The dependent variable is the return on sales (ROS, 2018); the control variables are previous year profitability, size, leverage, growth, capital intensity, industry and regional dummies. The empirical results suggest that higher ESG and E, as well as S ratings, do not significantly affect profitability in the short run. However, corporate governance has a significant positive effect at 5 per cent: a 10-point increase in G score increases ROS by 0.3 percentage points. Another important message of the paper is that social and environmental factors, which are often interpreted also as mere costs, do not significantly reduce short-term profitability.

Keywords: ESG, sustainability, well-being, smart working, financial profitability, WLS cross-sectional regressions

Introduction

The advocates of stakeholder theory argue that good corporate social performance (CSP) creates value-added due to higher stakeholder satisfaction (see for instance Orlitzky et al. 2003, Clark et al. 2015, Daugaard 2019). One of the major stakeholder groups is employees; therefore, better working conditions (e.g. smart working, equal opportunity for each demographic group, fair remuneration policy, diversity, health and safety, elder care backup) could increase their well-being which, in turn, results in higher productivity and corporate profitability. However, corporate strategies are increasingly emphasising not only pure social factors but environmental, and governance (jointly ESG) considerations due to their general well-being effects, hence this study covers all the three factors. Companies with high E, S and G scores are therefore socially conscious and well-managed companies with excellent reputation but with a small ecological footprint.

Statistical figures underpin the importance of ESG: according to 2018 data from US SIF Foundation, the total assets under management (AUM) by ESG-themed funds in the US increased twenty-fold by 2018 compared to 2010, approaching $12,000 billion (the figure was roughly $570 billion in 2010). The new survey of Krueger et al. (2020) with 439 respondents highlight the importance of climate risk.

The concept of ESG is not new, as many areas of economics have analysed ESG-type topics but under different names and focusing on only one of its elements. Comprehensive literature review articles have already been written, see, for instance, the study by Friede et al. (2015), which reviews more than 2,200 articles since the early 1970s.

However, academic findings on the relationship between financial and ESG performance are quite heterogeneous. Most researchers found positive relationship (e.g. Margolis – Walsh 2003, Roman – Hayibor – Agle 1999, Simpson – Kohers 2002, Orlitzky – Schmidt – Rynes 2003, Al-Tuwaijri – Christensen – Hughes 2004), while others did not have significant results (McWilliams – Siegel 2000, Cornett et al. 2013), but some studies have identified negative relationship (Wright – Ferris 1997).

A key question is how to measure financial performance. In the work of Günther-Hoppe-Endrikat (2011) or Peloza (2009), the authors summarise the most commonly used

metrics. Financial performance indicators are classified into three groups: accounting ratios (including ROS, ROE, ROIC), ratios that use both stock exchange and accounting data (e.g. P/E, EV/EBITDA), and measures calculated from stock exchange data (e.g. Jensen's alpha, Sharpe ratio)[39]. In the empirical part of this study, we analyse the net profit margin (ROS). Several studies used ROS as the dependent variable, see Hart – Ahuja (1996), Griffin – Mahon (1997), Graves – Waddock (2000), Wagner (2005), Callan – Thomas (2009), Qiu – Shaukat – Tharyan (2016).

We test the following hypothesis: return on sales of listed companies with high ESG scores (performance) is significantly higher than companies with low ESG ratings. We first analyse company ESG performance separately (E, S and G), then together (ESG score). The studied period covers only 2018, i.e. the focus is on short-term profitability.

Conceptual framework

The conceptual framework underlying this paper originates from the theory of corporate valuation. The term "value" is mostly measured by discounted cash flow (DCF) models. One version of the DCF formula based on value drivers is as follows[40].

$$E_0 = \sum_{t=1}^{\infty} \frac{S_{t-1} * (1 + g_t) \ * \ ROS_t - \ BV(E_{t-1}) * \ r_{Et}}{\prod_{t=1}^{\infty}(1 + \ r_{Et})} + \ BV(E_0), \qquad (1)$$

where E_0 is the present value of equity, $S_{(t-1)}$ is the turnover in period $t-1$, g_t is the expected growth rate of turnover in period t, ROS_t is the net profit margin during t, $BV(E_{t-1})$ is the book value of equity at the beginning of t, r_{Et} is the required return of equity. Based on formula (1), if a firm can increase its profitability (i.e. profit margin, ROS), it will also increase shareholder value, ceteris paribus.

Profitability is affected by several factors, which may include events affecting ESG performance. As an example, businesses that do not pay attention to the environment may face high environmental fines, lousy behaviour towards employees, customers, local

[39] Studies that analysed return data are for instance Edmans (2012), Eccles, Ioannou, and Serafeim (2013), Bebchuk, Cohen, and Ferrell (2010), Kovács, Dömötör, and Naffa (2011).
[40] The equation is a variation of the Residual Income (RI) model. More information on RI models see for instance Juhász (2018) or Ehrbar (1998).

communities may lead to a drop in sales and productivity, poorly managed businesses may find it challenging to adapt to challenges induced by competitors.

Dataset

The analysed data sample is from Bloomberg, and the observations are companies from the MSCI All Country World Index (MSCI ACWI). Table 1 summarises the variables involved in the analysis. These firm characteristics have been widely used in the literature, see for instance Russo – Fouts (1997), Wagner (2005), Callan – Thomas (2009), or Qiu – Shaukat – Tharyan (2016). The dependent variable is the return on sales (ROS) for 2018. The explanatory variables in focus are E, S, G, and the combined ESG scores, each provided by Sustainalytics. Ratings range from 0 to 100. A higher value indicates better ESG performance.

Control variables include previous year's ROS (2017), company size, leverage, capital intensity, average growth rates, industry and geographic (region) dummy variables. Size is quantified by the following variables: assets, sales, market capitalisation. We calculate their natural logarithm to maintain a linear relationship between the dependent and independent variables. Leverage metrics are as follows: book leverage, market leverage, and net debt/assets ratio. Growth is also measured with three variables: the average annual growth rate of assets, sales, and profit after tax between 2016 and 2018. To combine these measures into one variable principal component analysis (PCA) is applied (i.e. one size, leverage, and growth factor).

Table 1: Variables Applied in the Analysis

Factor	Variable
Profitability – ROS_2018	**Net income/Sales (2018)**
Profitability in 2017 – ROS_2017	Net income/Sales (2017)
Company size – SIZE	Market capitalisation (2018) Assets (2018) Net sales (2018)
Leverage – LEV	Book leverage (2018) Market leverage (2018) Net debt/Assets (2018)
Capital intensity – CAP	Capital intensity (2018)
Growth – GRO	Average asset growth (2016-2018) Average net sales growth (2016-2018) Average profit after tax growth (2016-2018)
ESG score	ESG score (2018) Environment score (2018) Social score (2018) Governance score (2018)

Source: Own compilation

Econometric Models and Estimation Methods

Due to Sustainalytics's methodology, "raw" ESG scores are only suitable for comparison within industries, so the transformation is required. To this end, we follow the procedures of Morningstar (2016):

$$zESG_i = \frac{ESG_i - \mu_{peer}}{\sigma_{peer}}, \qquad (2a) \qquad NormESG_i = 50 + (zESG_i \; x \; 10), \qquad (2b)$$

where ESG_i is the ESG score of company i, μ_{peer} is the mean ESG score of the peer group, and σ_{peer} is the standard deviation of the ESG scores for the peer. Standardised ESG scores are obtained according to equation (2a). Next (equation 2b), standardised ESG scores again take values between 0 and 100, averaging 50, due to normalisation. Individual company-level ESG scores become comparable with using equation (2b).

We estimate the linear regression model by following the below general equation (separate equations are required due to collinearity between each ESG variable).

$$ROS_{it} = \beta_0 + \beta_1 ROS_{it-1} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CAP_{it} + \beta_5 GRO_{it} + \beta_6 ESG_{it} + \sum_{j=1}^{11} \beta_6 IND_{ji} + \sum_{j=1}^{3} \beta_7 REG_{ji} + u_{it} \quad (4)$$

Similar models like equation (4) are generally estimated by ordinary least squares method (OLS) (see Qiu – Shaukat – Tharyan 2016, Wagner 2005, Russo – Fouts 1997).

Results

The results of the regression analyses can be found in Table 2. Based on F-tests, the explanatory variables together significantly explain profitability, hence the linear relationship is also valid. Based on adjusted R^2 values of around 53 to 54 per cent, the models have adequate explanatory power.

Firstly, most of the control variables are significant at least at 5 per cent and have signs one would expect: the higher the historical profitability, capital intensity and growth the higher the current ROS (higher leverage results in lower ROS). The only exception is corporate size, which is insignificant at the usual significance levels.

Table 1: Result of Regression Calculations

Variable	ESG			E			S			G		
	β	Std. err.	Sig	β	Std. err.	Sig	β	Std. err.	Sig	β	Std. err.	Sig
Cons	*4,96*	*1,74*	***	*5,97*	*1,72*	***	*5,65*	*1,76*	***	*3,14*	*1,77*	*
ROS_17	0,54	0,02	***	0,54	0,02	***	0,54	0,02	***	0,54	0,02	***
SIZE	-0,29	0,17	*	-0,27	0,17		-0,29	0,17	*	-0,24	0,16	
LEV	-0,05	0,01	***	-0,06	0,01	***	-0,05	0,01	***	-0,06	0,01	***
CAP	1,35	0,15	***	1,36	0,15	***	1,36	0,15	***	1,35	0,15	***
GRO	0,04	0,02	**	0,04	0,02	**	0,04	0,02	**	0,04	0,02	**
ESG	0,01	0,02										
E				-0,01	0,02							
S							0,00	0,02				
G										0,03	0,02	**
adj. R^2	0,553			0,557			0,552			0,564		
F	76,579			77,565			76,234			79,921		
p-value	0,000		***	0,000		***	0,000		***	0,000		***

Note: The dependent variable is the return on sales (ROS).

, **, and * indicate that the given variable is significant at 10, 5, and 1 per cent.*

Source: Own compilation

The empirical results suggest that the higher cumulative ESG and E, as well as S ratings, do not significantly affect profitability in the short run. However, corporate governance has

a significant positive effect at 5 per cent: a 10-point increase in the G score increases the profit margin by 0.3 percentage points. Another important message of the results is that social and environmental factors, which are often interpreted also as mere costs, do not significantly reduce short-term profitability.

Conclusions

This paper examined the effects of the environmental-social-corporate governance (ESG) characteristics of enterprises on the financial profitability of companies, namely on net profit margin (ROS). The study included a 1,099-item sample of firms from the MSCI ACWI Index and the analysed period was 2018. The applied control variables were previous year profitability, firm size, leverage, growth, capital intensity, industry and regional dummy variables widely used in the literature. The statistical background of the study was based on the weighted least squares (WLS) method.

The results are as follows: the aggregate ESG, E and S ratings do not significantly affect the profitability of enterprises in the short run. However, corporate governance (G) scores have significant and positive effects: a 10-point rise in the G score increases the net profit margin by 0.32 percentage points. The results also suggest that there is no short-term trade-off between E, S performance and financial profitability which indicates that higher revenues offset higher operating costs due to enhanced environmental and social performance. These latter results are in line with the findings of McWilliams and Siegel (2000), Garcia-Castro, Arino, and Canela (2010), Cornett, Erhemjamts, and Tehranian (2013). The findings show that caring about clean technologies, resource and waste management as well as social factors such as smart working conditions, equal opportunity for each demographic group, fair remuneration policy, diversity does not deteriorate profitability but improve the well-being of stakeholders.

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Lifestyle medicine – Can you create shareholder and employee value at the same time?

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Abstract

Employee well-being is nowadays a business imperative that every organization needs to consider. Programs, which aim to achieve the well-being of your staff, offer an excellent way to decrease the costs linked to employee turnover, absenteeism and presenteeism. Lifestyle medicine is an evidence-based approach to preventing, treating and even reversing diseases by replacing unhealthy behaviours with positive ones considering six areas of our life such as eating healthfully, being physically active, managing stress, avoiding risky substance abuse, adequate sleep and having a robust support system. Our paper analyses the impact of such workplace programs based on several interviews with attendees of lifestyle medicine programs in Hungary. We conclude that Lifestyle Medicine programs may offer a considerable upside for personal life, but positive work impacts mostly remain hidden for the participants. Still, those can be identified when focusing on indirect effects. It seems that the wide-range involvement of the employees and the strong commitment of the management is vital for the overall success. Still, even less than perfect programs can create value for both the employees and the firm.

Keywords: workplace-health programs, employee value, well-being, productivity

Introduction

Companies provide value to their employees when they care about their health and well-being; this, in turn, creates both shareholder and society value. The concept of “employee value” attempts to strike a “balance” between employee satisfaction, job dedication and productivity. In addition to employee compensation, numerous other factors play an essential role in creating value like work-life balance, workplace culture, or vocational training. (Deshpande, 2019).

In 2008, 34 percent of multinational companies worldwide initiated health programs for their employees. This ratio rose to 56 percent in 2014 and to 69 percent in 2016 (Xerox, 2016). The global market for corporate well-being services, valued at $29.3 billion in 2017, is set to grow at nearly 9 percent a year to $61.7 billion by 2026, according to a 2018 forecast by Transparency Market Research. Based on the market size of around 57 billion USD in 2019, Grand View Research (2020) even expects a total turnover of 97.4 billion USD by 2027 on the global corporate wellness market.

Research shows that every $1 spent on workplace health programs garners a return of $1.40 to $4.70 over three years (Goetzel et al., 2008). A study by PwC (2014) found that every dollar spent on mental health development brings a return of $2.30; research by Deloitte (2017) put the average return on investment at $4.20. Most international research puts the expected return at between $1 and $5; however, the methodology of those calculations is sometimes questionable (Szabó-Juhász, 2019). Still, it seems that efforts pay off. Willis Towers Watson’s Staying@Work survey in 2015-2016 found a close relationship between efficient health programs, higher worker productivity and better financial results (Stirzaker, 2017).

The majority of workplace-health programs concentrate solely on preventing disease and only in certain areas. However, the concept of lifestyle medicine has emerged recently representing a new and more sophisticated approach. It is an empirical evidence-based method that focuses on reversing diseases in addition to treating them. It puts special emphasis on preventing chronic disease, eschewing pharmaceutical-based remedies in favour of whole-food plant-based nutrition, regular exercise, proper sleep habits, stress management, social relationships, and avoiding harmful addictive substances. Education, practical training and experiences in these six areas are of paramount importance.

Health Development in the Workplace – impacts and goals

Aldana (2020a) argues that the primary impact of corporate-health programs is helping people learn and maintain healthy behaviours, thereby it diminishes risks to their health. (E.g. physical inactivity, poor nutrition, smoking and other addictions, insomnia, stress, as well as medical conditions such as high blood sugar, high cholesterol, and high blood pressure.) Reducing these risks has the beneficial effect of cutting healthcare expenditures not only on the personal but also on the corporate and society levels.

According to research by Mercer (2018a), organizations that produce well are those that take a role in improving their workers' general well-being (physical, emotional, financial and social well-being). People who score highly on tests that assess employee well-being are more affordable; employers spend 41 percent less on high-scorers than they spend on lower-scoring workers. Fluctuation among high-scoring employees was 35 percent lower, while their productivity was 31 percent higher. These studies found that 50 percent of workers want their employers to pay greater attention to their well-being. Employers who do so distinguish themselves; they make their companies more attractive to quality workers (Mercer, 2018b).

No wonder that when companies implement health programs, their main objective is to increase morale, dedication, and workforce maintenance while decreasing fluctuations (Szabó-Juhász, 2019). In a 2017 Investigator Sponsored Study (ISS), the largest number of companies cited these goals as most important because they bring about a decrease in absenteeism and expenditures while improving employee health and health consciousness (Nazareth, 2017).

A research by the Gallup Institute (Witters-Agrawal, 2015) found that satisfied workers – those who scored more points in the well-being index – were 30 percent less likely to be absent from work due to illness in the following month compared with those who might be engaged to their jobs, but whose well-being values were lower. Moreover, those with higher well-being scores spent 70 percent less time on sick-pay every year.

Empirical research on Hungarian lifestyle medicine experiences

To get a good overview of lifestyle medicine practices in Hungary, we conducted in-depth interviews. We focused on both employee and company level effects and value creation. We could only find one finished lifestyle medicine program in Hungary that was performed at AON, but several more are up and running.

Due to the limitations to hinder the spreading of the coronavirus, the interviews were conducted online. Six participants, three women and three men agreed to share their experiences during interviews lasting typically 60 minutes in March 2020, a year after the program finished. Three of the participants worked for less than ten years for the given employer, and two of them were below 35. Only two of the interviewees took part in all the 18 sessions of the program, others could not do so because of their work and clients.

Our interview-based research showed that participants of a Hungarian Lifestyle Medicine program identified various positive impacts on their personal life and overall well-being. At the same time, they started to experience no or very few effects on their office life. Still, when addressing indirect impacts, they could find some positive outcomes on satisfaction, engagement, energy, morale and connections. These limited results are yet not merely due to the type or quality of the training. In the given case, only a small number of colleagues participated in the program, and many have missed several of the sessions. Also, the direct superior of the participants showed up only at the first meeting that is considered by the participants to limit the team cohesion. We may conclude that just like in the case of other corporate health programs and enterprise risk management systems generally, a strong commitment of the top management is vital for overall success.

To synthesise our key findings, it seems that Lifestyle Medicine programs may create value both for employees and employers as it aims to improve factors with a proven link with both personal well-being and work productivity. However, both the initial level of employee wellbeing and the way a firm organises such training could impact the results.

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