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## **'Fifty is the new thirty': ageing well and start-up activities**

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This article examines the impact of ageing well on the employment behaviour of ageing workers. We focus on start-up activities because doing so circumvents potential constraints on labour market participation imposed by statutory retirement and employer practices. Using Finnish survey data, we find a positive and significant relationship between ageing well and the likelihood of engaging in start-up activities for individuals in their late forties and throughout their fifties.

## **I. Introduction**

As a result of increasing incomes and better medical care, individuals in developed countries, on average, live longer and more active lives than previous generations (UNDESA, 2011). The old mantra that ‘you are only as old as you feel’ has become an increasingly appropriate description of how we age. In fact, research shows that ageing is an individual process and that subjective (self-perceived) age is a better predictor of psychological and physical functioning than is chronological age (Uotinen *et al.*, 2003). While some fear the consequences for pension and health care systems arising from an ageing population, it is possible that ageing well could translate into a desire for longer or more active working lives and the emergence of a new pool of experienced labour.

Assessing the impact of ageing well on employment behaviour necessitates addressing two particular challenges. First, it is necessary to identify those individuals who are ageing well and distinguish them from those who are not. To resolve this problem we consider a positive subjective age bias, defined as the difference between an individual’s chronological age and their perceived age, as a proxy for ageing well (Uotinen *et al.*, 2003). If older cohorts of population feel younger than their chronological age (Rubin and Berntsen, 2006), then their employment behaviour should reflect that difference and be linked to a positive subjective age bias.

Second, the research design must account for regulation and possible ageist practices (Platman, 2003) that can limit participation in the labour force, even if ageing well

has encouraged individuals to continue their working career. To address at least in part this problem we examine engagement in activities aimed at starting a business. Running one's own business provides flexibility and is a salient exception to mandatory retirement and other labour market constraints (Zissimopoulos and Karoly, 2007). Thus, engagement in start-ups provides a natural experiment to test whether ageing well has implications for employment behaviour more generally.

## **II. Subjective Age Bias in the Decision to Start a Business**

Empirical evidence shows that the likelihood of being involved in start-up activities declines significantly as individuals approach retirement age (Parker, 2009). Frank (1988) explains this decline by showing that, since entrepreneurs use current informational advantages to produce future returns, incentives to entrepreneurship decline to zero as individuals approach retirement. Lévesque and Minniti's (2006) employment choice model elaborates on this explanation by showing that, unlike wages which are realised in the present, the returns from operating a business are realised in the future and that implies an opportunity cost varying with age. Since time is a more scarce resource for older individuals, the discount rate they attach to future payments is higher than for younger people and, as a result and all else being equal, starting a business is less desirable for ageing individuals.

We expand on this literature by arguing that a subjective age bias can affect the discount parameter individuals apply to returns from business ownership, meaning that the discounting of business income would not be a function of how old individuals are but how old they feel they are. In other words, feeling younger than

one's chronological age should have a positive impact on ageing individuals engaging in start-up activities.

### **III. Data**

We use original data from a survey of entrepreneurial activities and attitudes of the Finnish population aged 20–64 years conducted in April 2011 (wave 1) and May 2012 (wave 2). The sampling strategy for the survey was developed in cooperation with the Finnish Population Register Centre to ensure representativeness. Our sample consists of those respondents in wave 2 who, in wave 1, were thinking about starting a business as a career option but who were neither self-employed nor already engaged in start-up activities. Thus, our empirical research question addresses a specific step on the entrepreneurial ladder (van der Zwan *et al.*, 2010): the step from thinking about starting a business to taking concrete actions. Compared to including also those who have not thought about starting a business, our focus has the advantage of considerably reducing the effect of an important source of unobserved heterogeneity, individual entrepreneurial inclination.

We examined the mean of our subjective age measure between those who considered starting a business in wave 1 ( $n=489$ ) and those who did not ( $n=1029$ ). The comparison excludes those respondents who were already self-employed or engaged in start-up activities. The objective is to assess whether those who have thought about a start-up have a more positive assessment of their subjective age as a result of being more entrepreneurially oriented. The  $t$ -test indicated that the means of these two groups do not differ significantly ( $t_{1516}=.62$ ). From the 489 qualified respondents in wave 1, 49% participated in wave 2, yielding a final sample of 241 individuals.

We compared the participants in wave 2 ( $n=241$ ) with the eligible non-participants ( $n=248$ ) based on all wave-1 variables in our regression model (Table 1). The only significant difference is that the participants are marginally older on average than the non-participants (40 versus 38 years,  $t_{487}=2.12$ ).

#### IV. Econometric Strategy

Eq. (1) summarises the principal relationships to be estimated:

$$\begin{aligned} startup_i = & \alpha + \beta_1 age_i + \beta_2 age_i^2 + \beta_3 subage_i + \beta_4 age_i * subage_i + \\ & \beta_5 age_i^2 * subage_i + \beta_6 C_i \end{aligned} \quad (1)$$

The dependent variable is the self-reported number of start-up activities ( $startup_i$ , where  $i = 1, \dots, n$ ) that respondents engaged in between wave 1 and wave 2.

Examples of the nine gestation activities included in the survey are developing a business plan, engaging in marketing efforts and producing financial projections.

Chronological age ( $age_i$ ) is included in a quadratic specification and interacts with the individual's subjective age bias ( $subage_i$ ). The raw subjective age variable ('How old do you feel you are?') was converted to a proportional discrepancy measure:

(chronological age – subjective age) / (chronological age). This measure is less age-sensitive and thus more appropriate for the entire lifespan than the raw subjective age (Rubin and Berntsen, 2006). The vector of covariates  $C_i$  includes gender, prior experience of starting and running a business, education, marital status, occupational status and satisfaction with current standard of living (Parker, 2009). Table 1 displays means and standard deviations for all explanatory variables.

The properties of the dependent variable inform our choice of econometric strategy. Since the variable is a count from 0 to 9, with mean 1.20, variance 5.90, and an excessive proportion of zeros (39%), our initial choice of estimation technique is the zero-inflated negative binomial regression model (ZINB). ZINB puts extra weight on the probability of observing a zero through a mixing specification and, contrary to a zero-inflated Poisson model, it includes a parameter modelling over-dispersion. The observed variable  $y_i$  is the product of the two latent variables  $z_i$  and  $y_i^*$ , where  $z_i$  is a binary variable estimated with logit, and  $y_i$  has a negative binomial distribution (Greene, 1994). We compared the ZINB specification to a normal negative binomial regression using the Vuong test, and found support for the appropriateness of ZINB ( $z=5.89$ ).

## V. Results

Table 1 displays coefficient and robust standard error estimates for a ZINB specification of Eq. (1). To understand the interaction between *age* and *subage*, we computed the average marginal effect (AME) and standard error of *subage* on the predicted count of start-up activities for the full age range in the sample. Results show that the AME of *subage* is positive and significant ( $p<.05$ ) for individuals aged 45–59 years (Figure 1).

TABLE 1 ABOUT HERE

FIGURE 1 ABOUT HERE

To check for the robustness of the ZINB estimates, we estimated a two-part model specification comprising a logit model for zero versus a positive number of gestation

activities, and a negative binomial model for a truncated-at-zero count model that focused on 146 individuals who engaged in one or more gestation activities. Results are very similar to the ZINB estimates. Further, simple OLS estimates of the truncated-at-zero model yield results that are nearly identical to those from the negative binomial model. Regression diagnostics suggest that influential observations and serious multicollinearity are not concerns in this analysis.

## **VI. Conclusions**

Our results show that a positive subjective age bias, as a proxy for ageing well, has a significant positive effect on the likelihood that individuals who have thought about self-employment in their late forties and throughout their fifties will in fact engage in start-up activities. This suggests that ageing well has the potential to influence the market for labour by altering the employment behaviour of individuals approaching retirement.

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**Table 1. Zero-inflated negative binomial regression estimates**

Parameter	Mean (SD)	Logit	Negative binomial
Age	40.28	-.12	.00
(range: 20–64 years)	(11.64)	(.12)	(.04)
Age squared		.00	-.00
		(.00)	(.00)
Subjective age bias (subage)	.09	8.02	-5.11*
(range: -.88 to .56)	(.16)	(12.71)	(2.68)
Age*subage		-.38	.19
		(.62)	(.13)
Age squared*subage		.00	-.00
		(.01)	(.00)
Entrepreneurial experience	.20	-.31**	.19*
		(.39)	(.11)
Female	.49	.60*	.10
		(.33)	(.09)
Education (base: primary)			
Vocational	.21	-.05	-.08
		(.81)	(.22)
Secondary	.33	-.77*	-.21
		(.80)	(.22)
Tertiary	.42	-.42**	-.29
		(.77)	(.21)
Marital status (base: single)			
Cohabiting	.26	.50	-.03
		(.47)	(.13)
Married	.46	.32	.17
		(.43)	(.12)
Divorced or widowed	.06	1.40**	.07
		(.71)	(.32)
Occupation (base: employed)			
Job seeker	.09	.42	-.25
		(.58)	(.20)
Retired or receiving incapacity benefit	.03	-.02	-.47
		(1.22)	(.33)
Other outside labour force	.15	.57	.03
		(.52)	(.15)
Standard of living (base: somewhat satisfied)			
Very dissatisfied	.06	-.51	.09
		(.64)	(.20)
Somewhat dissatisfied	.25	-.59	-.18
		(.41)	(.11)
Very satisfied	.13	.28	-.39**
		(.46)	(.18)
Intercept		1.41	1.54*
		(2.47)	(.80)
Wald chi <sup>2</sup> (19 df)			66.56***
Log pseudolikelihood			-467.99

Notes: 241 observations (95 zero, 146 non-zero). Robust standard errors. \*, \*\* and \*\*\* denote 10%, 5% and 1% significance levels. Logit model:  $\Pr(\text{startup}=0)$ .

**Fig. 1 Average marginal effects of subjective age bias on predicted number of start-up activities when age varies (95% confidence intervals, robust standard errors)**

