

Senior citizens' intrinsic and extrinsic work motivation

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Abstract

Purpose – It is important to understand why some workers prolong their working life even though they are entitled to statutory pension benefits. This paper aims to investigate whether senior workers are motivated by external factors such as pay and social expectations (extrinsic motivation) or are primarily motivated by internal factors such as job satisfaction (intrinsic motivation). This is a central question for policymakers and social partners when it comes to the design of public pension systems and work organisation.

Design/methodology/approach – This study uses a combined longitudinal administrative data and an own-designed postal survey to ask individuals aged 65–76 years to describe their work motivation. Based on the answers, this study constructs an index of autonomous motivation (AM) where a value of zero implies only extrinsic motivation and a value of one implies only intrinsic motivation. The values between zero and one thus imply various grades of AM, where higher values signal motivation that is more autonomous and hence a higher degree of intrinsic work motivation.

Findings – The results of the statistical analysis show that the extent of intrinsic motivation is higher among senior workers who retired aged 65 years or older compared to those who retired at 65 years or younger. In addition, this study found that the degree of intrinsic work motivation among senior workers decreases when they face economic and financial constraints. It also found that intrinsic motivation is more prevalent among high-skilled workers.

Research limitations/implications – This study shows that individuals who continue to work after 65 are mostly motivated by the satisfaction they derive from their job. Job satisfaction is strongly related to skill level, job quality, job content and job autonomy. Results indicate that job quality and commitment to work are essential elements for motivating seniors to postpone retirement.

Originality/value – This study contributes to this literature by applying a multidisciplinary approach from organisational psychology and labour economics that considers the potential importance of intrinsic motivation to work after standard retirement age. The authors think that this approach enhances the understanding of the mechanisms behind the lengthening of working life. Finally, this study suggests a simple, but efficient way of empirically measuring the extent of intrinsic motivation among workers.

Keywords Conditions of employment, Employee attitudes, Retirement, Labour, Motivation (psychology), Older workers

Paper type Research paper

1. Introduction

During the last decade, the level of employment among the older population has increased in advanced economies. To illustrate: the employment rate of the population age 65–69 (EU27) in the European Union increased from 9.0% in 2010 to 13.2% in 2021 (Eurostat, 2022). The positive trend implies that an increasing share of the older workforce earns a labour income as a



substitute, or a supplement, to a pension income. It is hence important to understand why some workers prolong their working life even though they are entitled to statutory pension benefits. A fundamental question is whether the decision to delay retirement is largely motivated by economic considerations and/or social expectations or whether it is rather linked to job satisfaction. In other words, are senior workers motivated by external factors such as pay and social expectations (*extrinsic motivation*) or are they primarily motivated by internal factors such as job satisfaction (*intrinsic motivation*)? This is a central question for policy makers and social partners when it comes to the design of public pension systems and work organisation.

For several decades, organisational psychologists have analysed the distinction between *extrinsic* and *intrinsic* motivation (Deci, 1971; Deci and Ryan, 1985). People are said to be extrinsically motivated when “... *satisfaction comes not from the activity itself but rather from the extrinsic consequences to which the activity leads*” (Gagné and Deci, 2005, p. 331). On the other hand, people are intrinsically motivated if they are “... *doing an activity because they find it interesting and derive spontaneous satisfaction from the activity itself*.” (Gagné and Deci, 2005, p. 331). As paid work involves, in various degrees, both extrinsic and intrinsic motivation, the interaction between the two categories of work motivation has drawn increasing attention (see e.g. Lanfranchi and Narcy, 2022; Kuvaas *et al.*, 2020; Kuvaas *et al.*, 2017; Sicsic *et al.*, 2012).

Deci and Ryan (1985, 2000) further developed an analysis of the interaction and the relationship between intrinsic and extrinsic motivation in the self-determination theory (SDT). Motivation is modelled as a continuum of individuals’ *Internalisation of extrinsic motivation*, where internalisation is defined as “... *people taking in values, attitudes, or regulatory structures, such that the external regulation of a behavior is transformed into an internal regulation and thus no longer require the presence of an external contingency (thus, I work even when the boss is not watching)*” (Gagné and Deci, 2005, p. 334). Intrinsic motivation is thus a result of a process where the individual internalises the goal and content of a job to become an integral part of personal interest and enjoyment. This process involves several stages of increasing *autonomous* motivation (AM).

In this paper, we apply the SDT approach to empirically estimate the extent of autonomous work motivation among residents in Sweden aged 65 years and older. Some specific institutional features in Sweden make working after the age of 65 years of particular interest. In 2021, the employment rate of the population age 65–69 years in Sweden amounted to 27.5%, significantly above the EU average (Eurostat, 2022). Although age 65 has been for many years the standard age of retirement, the choice between continuing to work after 65 or retiring is nowadays to a larger extent an individual decision. The Swedish public pensions system allows people to withdraw pension benefits at the earliest at the age of 62 [1]. The current public pension system is a defined contribution system with pension benefits based on lifetime income and increasing by age of retirement. In addition, supplementary collective agreements on pension savings imply that pension benefits often increase at age 65. The Swedish labour law insures employment protection up to 68 years old (until 2019, 67 years old). Our main research question is hence to what extent the growing share of people that continue working after age 65 are mainly intrinsically and/or extrinsically motivated.

We use a longitudinal administrative data combined with an own designed survey questionnaire where individuals aged 65–76 were asked, *inter alia*, about their work motivation. Based on the replies to these questions, we construct an index of autonomous motivation (henceforth the AM-index) where zero implies only extrinsic motivation and one implies only intrinsic motivation. The values between zero and one thus imply various degrees of AM, with higher values indicating motivation that is more autonomous and hence a higher degree of intrinsic work motivation.

We investigate the following research questions. Firstly, pension entitlements may reduce a person’s extrinsic work motivation and increase the likelihood of entering into retirement and exiting from the labour force (e.g. Pleau and Shauman, 2013). On the other hand, it follows from

the SDT that work incentives of autonomously motivated workers may not be negatively affected by available pension benefits (Gagné and Deci, 2005). It is thus possible that workers still working after the standard age of retirement constitute a selection of individuals with a generally higher degree of autonomous work motivation. Consequently, we firstly explore whether the extent of AM is higher among senior workers aged 65 and older compared to individuals who retired at 65 years old or earlier. Secondly, some respondents may continue to work after age 65 due to economic and financial constraints, which means that their income and living standard are contingent on staying on the labour market instead of retiring and being able to do other things that could be interesting and stimulating. These workers could thus also be extrinsically motivated to work due to financial incentives, which in line with the SDT could reduce the extent of their AM. In other words, we want to assess whether the degree of AM is lower among senior workers experiencing financial and economic constraints. Thirdly, it is likely that investments in training and skill acquisition are enhanced by autonomous work motivation. Skilled workers are also more likely to have higher degrees of job autonomy, which is positively related to AM (Gagné and Deci, 2005). There are thus reasons to expect that a higher skill level affects positively AM among senior workers. Finally, workers with a higher level of extrinsic motivation are more likely to reduce their working hours over time, since the external reward in terms of pay and employers' expectations are likely to diminish when the individual gets older. On the other hand, senior workers that are autonomously motivated are less likely to be influenced by external reward when it comes to their working hours. It is therefore likely that AM is positively correlated to working hours and this effect becomes increasingly significant as the senior worker becomes older. In other words, we want to test whether working hours are longer among senior workers having a higher degree of AM.

Previous studies have analysed several financial, individual, work-related and social factors that influence the incentives to delay retirement (e.g. Lorenz and Zwick, 2021; Anxo *et al.*, 2019; Dingemans *et al.*, 2017; Wang *et al.*, 2008). Although there is an extensive literature on determinants of postponed retirement, the importance of autonomous work motivation has been largely ignored. We contribute to this literature by applying a multidisciplinary approach from organisational psychology and labour economics that considers the potential importance of intrinsic motivation to work after standard retirement age. We think that this approach enhances our understanding of the mechanisms behind the lengthening of working life. Knowledge about the work motivation of workers in retirement age is also important for our understanding of their well-being and the changing roles in society and workplaces. Finally, we suggest a simple, but we think efficient, way of empirically measuring the extent of intrinsic motivation among workers. This allows us to test several hypotheses on the relationship between intrinsic motivation and work at old age described previously. A limitation of this study is that we cannot prove the causality between work at old age and intrinsic motivation, which remains to be done in future research.

The paper is structured as follows: after a short description of the contextual and institutional framework and an analysis of the development of senior employment in Sweden, Section 3 provides some theoretical considerations regarding extrinsic and intrinsic work motivation as well as the main hypotheses to be tested. Section 4 describes the data and the method used for constructing our index of AM. Section 5 reports the results of our econometric estimations. Finally, the last section provides some concluding remarks.

2. Contextual and institutional background

By international standards, the employment rate of the Swedish population 55–64 years old was in 2020 one of the highest amongst post-industrial economies, namely 79.8% for Swedish men and 75.3% for Swedish women, compared to the EU average of 66.2% for men and 53.4% for women (Eurostat, 2022). Furthermore, the employment rate of the population aged

65 years and older has increased from 9.9% in 2005 to 23.1% in 2020 while the employment rate amongst 65–74-year old was 12.5% for the EU as a whole.

Like other modern economies, the Swedish society is ageing due to an increase in life expectancy and a decline in fertility rates. Combined with a delayed entry into the labour market and an earlier exit from the labour force (a tendency to shorten working life), it was increasingly argued that the ageing population posed a serious challenge to the long-term financial sustainability of the Swedish public pension system (see [Anxo et al., 2012](#)). The Swedish pay-as-you-go state pension system was reformed in 1999 with an aim to increase the economic incentives to prolong working life. Furthermore, alternative exit routes such as unemployment benefits, disability pensions or early retirement schemes were closed or restricted. The new state pension system, which applies completely for individuals born in 1953 and after, is based on a person's life-time earnings principle and a flexible retirement age [\[2\]](#). The new statutory public pension system provides freedom to combine work with pension benefits, and both employees and self-employed persons are eligible to pension benefits. Pension benefits increase the longer you work and the financial incentives for postponing retirement are therefore strong (see [Anxo et al., 2019](#)). Statutory income pension is payable from the age of 62 [\[3\]](#) for both men and women. However, the size of the pension will increase the longer the retirement is postponed, and the financial incentives for postponing retirement are strong. Nevertheless, the standard age of retirement remains 65 years for a majority of men and women in Sweden, particularly for the cohort analysed in the present study.

In [Anxo et al., \(2019\)](#), using the same data set as in the present study, we analysed the extent to which socio-economic factors and individual characteristics influence senior citizens' decisions to retire at age 65 or to stay longer on the labour market in Sweden. The results show clearly that good health, high educational attainment, good working conditions as well as the individual's employment status (to be self-employed) are strong predictors of working beyond 65 years old. Well-functioning work organisation, particularly extensive job autonomy, the ability to determine working hours and job content, are important factors influencing the willingness of senior citizens to stay longer in the labour force. Monotonous, physically and/or psychologically demanding jobs reduce the likelihood to continue working after standard retirement age. This indicates that job quality and work satisfaction are essential elements for motivating seniors to postpone retirement. Age and family norms as well as perceived life expectancy are also important factors affecting the decision to stay or not on the labour market after 65 years old.

3. Theoretical framework and main hypotheses

3.1 Previous literature on intrinsic and extrinsic work motivation

The motivation to engage in paid work is a central topic in both labour economics and organisational psychology. According to standard labour economics, a natural starting point is to study how financial compensation affects the individual's allocation of time between paid work, unpaid domestic work and leisure time (e.g. [Becker, 1981](#)). The neoclassical economic model of labour supply assumes that individual's utility increases by financial compensation, while utility is negatively related to work effort. Thus, an individual's work motivation depends essentially on employers' compensation schemes. This kind of motivation has been defined by organisational psychologists as extrinsic motivation: "*Individuals are extrinsically motivated when they engage in the work in order to obtain some goal that is apart from the work itself*" ([Amabile, 1993](#)). The role and impact of such extrinsic motivation has been studied extensively in the economic literature on incentive contracting in organisations (see e.g. [Gibbons, 1998](#); [Lazear, 2000](#)).

An alternative approach to worker's supply of paid work is the concept of *intrinsic motivation* ([Deci, 1971](#)). In contrast to standard neoclassical economic models, utility is

derived from the activity itself, motivating the worker to engage in paid work and determining its work effort. According to [Deci and Ryan \(2000\)](#), the activity itself reinforces the worker's feeling of control, competence and self-determination: "*Intrinsically motivated behaviors are those that are freely engaged out of interest without the necessity of separable consequences, and, to be maintained, they require satisfaction of the needs for autonomy and competence*" ([Deci and Ryan, 2000](#), p. 233).

The initial proposition by [Deci \(1971\)](#) was that if an activity is rewarded externally (*Externally Mediated Rewards*), then an intrinsically motivated person may feel that other people view his or her activity as predetermined and decided by others, which, in turn, weakens the person's feeling of competence and self-determination, hence weakens the intrinsic motivation.

[Deci and Ryan \(1985, 2000\)](#) further develop the analysis of the interaction and relation between intrinsic and extrinsic motivation in the SDT. Instead of a dichotomy between intrinsic and extrinsic motivation, the motivation can be modelled as a continuum of individuals' *Internalisation of extrinsic motivation*, where internalisation is defined as "... people taking in values, attitudes, or regulatory structures, such that the external regulation of a behavior is transformed into an internal regulation and thus no longer require the presence of an external contingency (thus, I work even when the boss is not watching)" ([Gagné and Deci, 2005](#), p. 334). *External regulation* is the lowest level of internalisation where individuals engage in an activity simply because they receive some kind of reward or avoid punishment, which corresponds to the original definition of extrinsic motivation. The next stage of internalisation is the *introjected regulation* where people behave in order to feel worthy or to support their ego, while they still are not interested in the activity itself or the purpose and goals of the activity. When the individual's internalisation reaches the next stage of *identified regulation*, they identify with the value of a behaviour and feel that it is consistent with their own personal goals and identities. The fullest stage of internalisation is denoted *integrated regulation* where the person senses that the activity is an integral part of who they are, and hence self-determined (see [Table 1](#)).

This model of *autonomous extrinsic motivation* through the process of individual's internalisation can be particularly useful in the context of work motivation since there are always external influences and reactions to a person's activity from employers, colleagues or customers. Furthermore, it may help us to understand why monetary rewards have different effects on workers' motivation. If monetary rewards are administrated in an "autonomy-supportive context", for example, as a bonus or salary which is unrelated to a quantitative measure of performance, then the individual's internalisation of extrinsic motivation is less likely to diminish. On the other hand, if the monetary reward is designed as a piece-rate compensation, then internalisation of extrinsic motivation may diminish. [Gagné and Deci \(2005\)](#) point out that "... the interpersonal climate within which rewards are administrated has a significant influence on the rewards' effect. Specifically, when rewards are administrated in an autonomy-supportive climate, they are less likely to undermine intrinsic motivation and, in some

Table 1.
Self-determination
continuum process:
amotivation; extrinsic
motivation and
intrinsic motivation

Type of motivation	Characteristics
<i>Amotivation</i>	Absence of intentional regulation
<i>Extrinsic motivation</i>	
- External regulation	Contingencies of reward and punishment
- Introjected regulation	Self-worth contingent on performance
- Identified regulation	Importance of goal value and regulation
- Integrated regulation	Coherence among goal, values and regulations
<i>Intrinsic motivation</i>	Interest and enjoyment of the task

Source(s): [Figure 1](#) in [Gagné and Deci \(2005\)](#)

cases, can enhance intrinsic motivation” (Gagné and Deci, 2005, p. 354). Moreover, in a meta-analysis, Cerasoli *et al.* (2014) find support of the hypothesis that the relationship between intrinsic motivation and performance is *strengthened* by the presence of *indirect* performance-salient incentives, such as payment or compensation that are not directly related to performance, for example, a fixed salary. They also find support of the hypothesis that the relationship between intrinsic motivation and performance is *weakened* by the presence of *direct* performance-salient incentives, such as performance-related bonuses or sales commissions.

3.2 Motivation to work at old age and main hypotheses

We now turn our attention to work motivation among senior workers. According to the categorisation by Scherger (2015), we focus on “Workers of pension age with pension claims” (pension deferral) as well as “Working pensioner” (combining pension income with paid employment) and “Workers of pension age without pension claims”. Several studies have analysed the impact of age, years of education, gender, health, previous income and working conditions, etc. on the worker’s decision and motivation to *enter* various forms of employment in retirement age (e.g. Kim and Feldman, 2000; Davis, 2003; Wang *et al.*, 2008; Hanson Frieze *et al.*, 2011; Zhan *et al.*, 2015; Dingemans *et al.*, 2017; Anxo *et al.*, 2019). By contrast, our study considers work motivation as an outcome variable, dependent on retirement age, as well as other socio-economic variables.

An individual can be both extrinsically and intrinsically motivated to work at old age. On the one hand, the individual may be extrinsically motivated to stay in the labour force due to financial constraints and/or the desire to sustain a specific standard of living (e.g. Lorenz and Zwick, 2021). Retirement usually entails a reduction of disposable income, and this can be offset by a transitional period of continued paid work. Extrinsic work motivation can thus be a result of the desire to sustain a reasonable living standard in the presence of low pension benefits. In Sweden low pension benefits, in turn, are often a result of low previous pensions savings and weaker life-course attachment to the labour market (Lindquist and Wadensjö, 2009). These circumstances push the individual to continue working and to postpone retirement. However, the extrinsic motivation to continue working can also be a result of employer demand for skilled and experienced employees. Due to skill shortages in some occupations, some senior workers can remain attractive co-workers in organisations in both the public and the private sector. They can be offered generous contracts to extend their career employment or to become consultants providing guidance and training to less experienced younger workers. In addition, not only monetary compensation can affect extrinsic motivation of senior workers. Expectations of colleagues and encouragement by the employer to continue working can also affect positively extrinsic motivation (positive valuation). Societal normative aspects are also important, some occupations having norms and traditions of late retirement favouring continued full-time employment or employment on a part-time basis. There are thus several pull factors that create extrinsic motivation for postponing retirement and working at old age.

On the other hand, the individual may also be intrinsically motivated to continue working after the standard age of retirement. After many years in the labour force, having a job can be a central part of a person’s identity. In accordance with SDT, the intrinsic motivation is supported by the person’s feelings of autonomy and competence at the workplace (Gagné and Deci, 2005). To stop working and retire implies a cost in terms of lost identity and a loss of interesting and stimulating activities. Intrinsic work motivation can thus create strong incentives to continue working and delay retirement. In line with this reasoning, Henning *et al.* (2019) have found that high intrinsic work motivation before retirement was related to increased relatedness satisfaction (satisfaction from social network, family and friends) when workers continued to work after retirement age.

It is hence reasonable to assume that the motivation to work at older age consists of a combination of both intrinsic and extrinsic motivations, which, according to the SDT, can be modelled as a continuum of various degrees of AM, where intrinsic motivation (high AM) is a result of a process of *internalisation* where individuals take in values and attitudes such that external reward are no longer the only motivation for doing the job.

We assume that workers of retirement age are motivated according to this continuum of extrinsic and intrinsic motivation (Gagné and Deci, 2005). When they reach an age where they are eligible for pension benefits, extrinsic motivation to work is reduced, since, due to pension benefits, labour income is less crucial to sustain living standards. This reduction of extrinsic motivation may be sufficiently large to induce people to retire, especially for people in the stages of “*External regulation*” and “*Introjected regulation*” (see Table 1). However, individuals with a high degree of intrinsic work motivation may continue to work, despite that available pension income implies lower economic incentives to stay in the labour force. Furthermore, in some countries (for example, Sweden), some specific institutional arrangements make it possible for individuals to withdraw pension benefits and continue working on a full-time or part-time basis. In that case, an increased income (i.e. pension benefits) which is unrelated to current effort and activity should not decrease the individual’s intrinsic motivation, as the monetary reward from the pension benefit is administrated in an autonomy-supportive context (Cerasoli *et al.*, 2014; Gagné and Deci, 2005). In other words, monetary compensation in the form of pension benefits do not induce extrinsically motivated workers to continue working. On the other hand, intrinsically motivated workers will not be discouraged to continue working after the standard age of retirement as their work motivation is not negatively affected by the available pension benefits. Consequently, we may assume that:

- H1. Provided that individuals are entitled to pension benefits upon retirement, individuals that continue to work beyond the standard age of retirement are more intrinsically motivated than individuals that retire at the standard age of retirement or earlier.

Individuals with more erratic work trajectories and weaker labour market attachment across the life-course display lower previous average labour income and consequently also lower pension benefits. These individuals may continue to work after the standard age of retirement due to financial constraints, which means that their income is contingent on staying on the job instead of retiring and being able to do other interesting and stimulating things. Consequently, the monetary reward is *not* administrated in an autonomy-supportive context, which results in lower AM (Gagné and Deci, 2005). In other words, if a person is extrinsically motivated to work beyond the standard age of retirement because of low alternative income from pension benefits, then a person’s intrinsic motivation to work should be weaker.

On the other hand, some individuals with higher previous average income may be encouraged to continue working beyond the standard age of retirement due to an employer’s wish to retain skilled and experienced workers. Some individuals may choose to become self-employed and receive a high income as consultants or senior advisers, etc. These individuals display a high internalisation of extrinsic motivation to continue working due to the fact that monetary rewards are administrated in an autonomy-supportive context. The increased earnings from work beyond the standard age of retirement is not conditional on external requirements and conditions, in contrast, the earnings are supported by a continued autonomy and use of experience and competence.

Hence, we assume that:

- H2. The degree of AM for senior workers is lower when a person continues working due to financial *constraints/restrictions*.

The individual's level of skills is also likely to influence the degree of autonomous work motivation. To obtain a high skill level in any occupation the individual needs to train and invest in commitment and effort that will result in a pay-off at a later point in time. Such investments should be enhanced by motivation that is not dependent on immediate external rewards. Hence AM is likely to be more common among high-skilled workers. In addition, high-skilled occupations can result in greater job autonomy and better working conditions enhancing AM. We therefore assume the following:

H3. The degree of AM is positively related to the level of skills of workers.

If a senior worker is primarily extrinsically work motivated, then it is likely that working hours will be reduced over age, since the external reward in terms of pay and employers' expectations are likely to diminish when the individual gets older. On the other hand, individuals primarily intrinsically motivated to continue working after the age of retirement are less likely to be influenced by external factors when it comes to their working hours. Instead, it is their own interest and commitment that influence their working hours. Hence, we assume that:

H4. AM among senior workers increases with the time they spend at work (working hours).

4. Data and methodological considerations

4.1 Data

Our own designed postal survey was sent by Statistics Sweden to a sample of senior citizens aged 65 and older. Our sampling frame included all individuals living in Sweden in 2012 and who were born between 1938 and 1949 (i.e. aged between 65 and 76 years old at the time of the survey in 2014). From this population, a stratified random sample of 20,000 people was drawn. The population was then divided in two groups; the first group was composed of senior workers still employed in 2012 (15,000 individuals) [4]. The second group included individuals who had left the labour force in 2012 (5,000 individuals). A rich set of socio-economic variables, from Statistic Sweden's longitudinal database-LISA (Statistics Sweden, 2016) was linked to each of the 20,000 randomly selected individuals giving us a rich set of information regarding previous work trajectory, income and life history over a period of 23 years. The survey was separated into seven sections (1. Background variables; 2. Work experience; 3. Your situation at age 65; 4. Working life current situation; 5. Motives to continue working; 6. Social relationships and well-being; 7. Personality traits). In total, the survey contained 90 questions and was sent to the participants by mail. The survey response rate was 60.8%, which is considered acceptable for this type of survey (See Table A1 in the appendix for a definition of variables) [5]. Some descriptive statistics are displayed in Table A2 in the appendix.

4.2 Empirical implementation and creation of a motivation index

4.2.1 Empirical strategy. Our empirical strategy relies mainly on the theoretical approach developed by Deci (1971) and Deci and Ryan (1985). In order to construct a motivation index and to assess whether AMs are higher among senior workers currently working compared to those leaving the labour market at 65 years old or earlier, we rely on own-reported statements about respondent's, motives, working environment, attitude and working conditions (see Table 2 and Table A3 in the appendix for men and women). These statements concern the year preceding the respondent's retirement which means that work motivation is measured retrospectively for individuals that were retired at the time of the survey. For the respondents still working when the survey took place their statements regarding their motives to continue

Table 2.
Working conditions
and job characteristics
for senior workers at
the age of 64 and past
working conditions
and job characteristics
in job preceding
retirement for senior
citizen currently
retired, in per cent

	(1) Good cohesion and atmosphere	(2) Hang out with co- workers	(3) Personal commitment	(4) My work is monotonous	(5) Stimulus and enrichment
<i>Retirees</i>					
Agree					
- Completely	59.3	13.5	50.2	4.1	n.a.
- Partially	31.8	53.0	29.7	18.6	n.a.
- Not at all	5.1	28.0	13.3	74.9	n.a.
- Don't know	3.9	5.5	6.8	2.4	n.a.
Number of observations	7,806	7,759	7,532	7,659	
<i>Current senior workers</i>					
Agree					
- Completely	62.5	10.7	71.2	2.5	73.6
- Partially	31.5	44.9	24.5	14.5	23.4
- Not at all	6.0	44.4	2.7	83.0	1.9
- Don't know	—	—	1.6	—	1.1
Number of observations	2,419	2,396	2,457	2,416	2,466
Note(s): Good cohesion and atmosphere: “The cohesion and atmosphere is/was good at my workplace”; Hang out with co-workers: “I usually/used to hang out with my co-workers after work”; Personal commitment: “I feel a great personal commitment in my work”; My work is monotonous: “My work is/was monotonous”; Stimulus and enrichment “I feel that my work stimulates me and enriches me”					
Source(s): Own calculations, based on our Survey questionnaire					

working after 65 years old, their working environment, attitude and working conditions concern the situation at 64 years old. This will allow us to investigate if the degree of AM changes by the age of retirement and whether senior workers are more intrinsically motivated than individuals that are currently retired.

AM is measured by the five statements reported in [Table 2](#).

The first two statements (*Good cohesion and atmosphere* and *Hang out with co-workers*) signal that working environment and social contacts on the job may create extrinsic motivation to work and are hence not sufficient for autonomous work motivation. However, in combination with the other statements in [Table 2](#), they are likely to enhance AM. The third statement (*Personal commitment*) will obviously add to the individual’s level of AM, while the fourth statement (*My work is monotonous*) will contribute to autonomous work motivation if the respondent *do not* agree. The final statement (*Stimulus and enrichment*) also contributes to a high level of AM. Consequently, if a person totally agrees with all these statements (apart from the statement “My work was monotonous”), then this person can be classified as highly autonomously motivated. On the other hand, if a person do not fully agree or disagree with one or several of the statements (and agrees that work in monotonous) then it is an indication of a lower level of autonomous work motivation.

[Table 2](#) displays the share of respondents that agree with the above-described statements.

The internal validity of the statements were tested by Cronbach’s alpha. The statements 1–4 are calculated to 0.3815 for the Retirees and 0.3720 for the Current senior workers. When adding statement 5 for Current senior workers, Cronbach’s alpha increases to 0.5044.

As shown by [Table 2](#), compared to respondents retired at 65 or earlier, a larger share of current senior workers completely agrees that they feel a great personal commitment in their work. A lower share of senior workers respondents report that their job was monotonous or that they have contact with their colleagues outside the workplace.

A gender decomposition of these statements is reported in Table A3 in the Appendix. As shown by Table A3, job commitment seems to be on average stronger among women. Also worth noticing a lower share of women report that their workplace presented good cohesion and atmosphere.

4.2.2 Motivation index. We construct an index of autonomous motivation (AM-index) based on the above-described statements reported in Table 2 using the following formula:

$$AM = I/(2N) \quad (1)$$

where

I = the number of scores from the statements about AM in Table 2 (Agree completely = 2; Agree partly = 1; Not at all = 0; Don't know = becomes a missing value)

N = the number of statement

It follows that the maximum value of an individual's autonomous motivation is $AM = 1$, which will be obtained if the individual totally agrees with all the statements about AM ($AM = 2N/2N = 1$). By the same logic, the minimum value of the AM-index is $AM = 0$, which will be obtained if the individual does not agree with any of the statements about the AMs ($AM = 0/2N = 0$). The intermediate cases where the individuals partly agree or do not agree with one or more of the statements about AM result in $0 < AM < 1$.

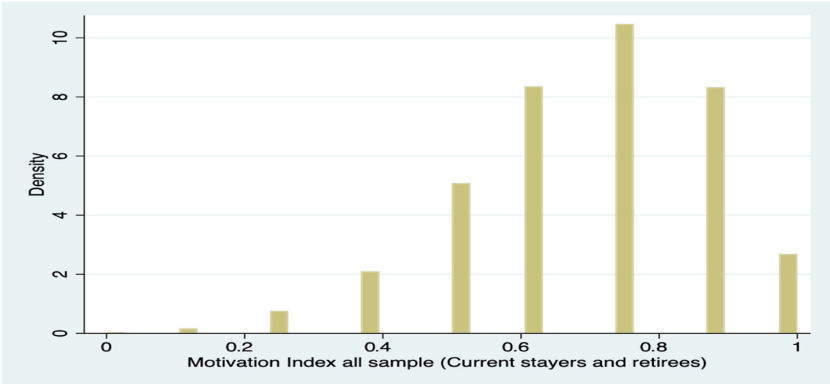
The index AM in (1) serves as an empirical measurement of the stages of internalisation of extrinsic motivation in the SDT, where $0 < AM < 0.5$ indicates a low level of AM ("Controlled Motivation" and "Moderately Controlled Motivation"), whereas $0.5 < AM < 1$ indicates a high level of AM ("Moderately Autonomous Motivation" and "Autonomous Motivation") (see Table 1).

Our empirical analysis relies on two versions of the AM-index. Firstly, the index that enables us to measure autonomous work motivation for the whole sample includes item 1–4 in Table 2. Agreeing to statements 1–3 (Good cohesion and atmosphere; Hang out with co-workers; Personal commitment) and *not* agreeing to the statement 4 ("My work is monotonous") increases the degree of autonomous work motivation. A second version of the index (Alt-AM-index) includes items 1–3, 5 in Table 2, where statement 4 "My work is monotonous" is replaced by statement 5 "Stimulus and enrichment". This latter item was only available for current senior workers in the survey. Consequently, this second version of the AM-index will serve as a robustness check for current senior workers in the empirical analysis below.

The distribution of the first index AM for the sample as a whole (dependent employees, item 1–4 in Table 2) is displayed in Figure 1 (see Figure A1 for the distribution for current senior workers in the Appendix).

4.2.3 Motivation's individual attributes and socio-economic factors. In order to test Hypothesis 1, i.e. that current senior workers exhibit a higher level of AM than retirees we use in a regression analysis four categorical variables: *Early retired* (retirement before age 65); *Standard retired* (retirement at age 65); *Late retired* (retirement after age 65) and *Current senior worker* (currently working after age 65). We control the impact of financial constraints/restrictions on work motivation by the variable *Economic constraints*. This variable is based on a hypothetical question asked in our survey questionnaire only among current senior workers: "Suppose you would win SEK 5 million on a lottery. What would you do?" (11 SEK = 1 Euro). Those who answered "Stop working completely" and at the same time agreed completely to the statement "Economic considerations were a strong motive to continue to work (after age 65)" are classified as continuing working due to financial constraints/restrictions. This variable will thus serve to test the validity of Hypothesis 2,

Figure 1.
Distribution of the AM
index for retirees and
current senior workers,
previous and current
dependent employees



Note(s): Number of observations = 7,886; weighted mean = 0.69 median = 0.754, Standard deviation = 0.19;
Source(s): Own calculations, based on Register Data, LISA database from Statistics Sweden (2016) and our Survey questionnaire

where *Economic constraints* are expected to reduce the index AM among current senior workers.

The skill-level of respondents is measured by three categorical variables *Low skill*, *Medium skill*, and *High skill* (Swedish ISCO classification occupations, see Table A1 in the appendix for definitions). Hypothesis 3 implies that *Low skill* reduces the AM index, while *High skill* is expected to have an opposite and increasing effect on the extent of AM. Finally, the variables *Current working hours* and *Working hours in the last job* preceding retirement are stated by the respondents in the survey. Longer working hours for those currently working after age 65 (*Current working hours*) is expected to increase the index AM among current senior workers according to Hypothesis 4. We also test if longer working hours before retirement are associated with more intrinsic work motivation for both those currently working after age 65 and those who retired before age 65 or at age 65 (*Working hours before*).

For assessing the variation of AM index across socio-demographic groups, we control for gender; country of birth; public or private sector employment; and cohort (1938–42; 1942–45; 1946–49). Table 3 displays the means of the motivation index, AM, for various groups in the data.

As expected, the mean value of the index increases from 0.69 to 0.74 for retired having worked after age 65 (*Late retired*) and for those who currently were working at the time of the survey (*Current senior worker*). The same pattern is also observable in the subgroups below the first row in Table 3. AM appears to be similar among men compared to women, while slightly lower among foreign-born compared to natives. Employees in the private sector exhibit also a slightly lower level of AM than in the public sector. When it comes to cohorts, there are only small differences between already retired people. AM is slightly higher for the oldest cohort but the differences in the level of AM across cohorts are small. As also shown by Table 3, AM increased significantly by skill level among both workers that have retired (Early retired; Standard retired; Late retired) and also among Current senior workers.

5. Econometric estimations

In order to test the validity of our four hypotheses we use a standard Fractional Outcome Regression technique which is well adapted when the dependent variable takes the form of an

Intrinsic and extrinsic work motivation

	All (age 65–76)	All retirees	Early retired	Standard retired	Late retired	Current senior worker
Motivation index (0–1)	0.69	0.68	0.68	0.68	0.74	0.74
Male	0.69	0.68	0.67	0.67	0.74	0.74
Female	0.69	0.69	0.68	0.68	0.74	0.74
Natives	0.69	0.69	0.68	0.68	0.74	0.74
Foreign born	0.64	0.64	0.63	0.62	0.72	0.72
Private sector	0.68	0.68	0.66	0.66	0.74	0.74
Public sector	0.70	0.70	0.69	0.69	0.73	0.73
Cohort 1938–1942	0.70	0.70	0.69	0.69	0.75	0.75
Cohort 1942–1945	0.69	0.69	0.68	0.68	0.73	0.73
Cohort 1946–1949	0.68	0.67	0.66	0.66	0.73	0.73
Low skill	0.63	0.57	0.54	0.58	0.67	0.67
Medium skill	0.69	0.68	0.68	0.68	0.73	0.73
High skill	0.73	0.73	0.72	0.73	0.76	0.76
Number of observations	7,886	5,786	1,845	2,409	1,532	2,100

Source(s): Own calculations, based on Register Data, LISA database from [Statistics Sweden \(2016\)](#) and our Survey questionnaire

Table 3. Motivation index, AM (0–1) All, All retirees, retired before 65 (*Early retired*), retired at 65 years old (Standard retired), retired after 65 (*Late retired*) and currently working (*Current senior worker*), dependent employees

index ranging from zero to one (see [Papke and Woodridge, 1996](#), for a description of the method) [6].

5.1 Autonomous motivations among current senior workers and retirees

As shown by [Table 4](#), *Late retired* (after 65 years old) and *Current senior worker* display *ceteris paribus* a statistically significant higher level of AM compared to *Early retired* and

Variables	(1) All	(2) Men	(3) Women
Male	–0.0135*	–	–
Foreign born	–0.0382***	–0.0222	–0.0489**
Medium skill	0.0966***	0.0599***	0.149***
High skill	0.128***	0.0974***	0.173***
Autonomy	0.0552***	0.0618***	0.0459**
Cohort 1942–1945	–0.0183*	–0.0147	–0.0222
Cohort 1946–1949	–0.0322***	–0.0289**	–0.0366***
Early retired	–0.00585	–0.00169	–0.00707
Late retired	0.0386***	0.0466***	0.0277*
Current senior worker	0.0326***	0.0377***	0.0271**
Working hours before*	0.00109***	0.000636	0.00129**
Public sector	0.00882	0.00606	0.00930
Conditional mean	0.6902	0.6884	0.6921
Observations	7,619	4,054	3,565

Note(s): *Statistically significant at 10% level; ** 5 %t level; *** 1% level

*“Before” means before the actual age of exit for *Early retired* and at 64 years old for *Current senior workers* Marginal effects estimated at sample means

Source(s): Own calculations, based on Register Data, LISA database from [Statistics Sweden \(2016\)](#) and our Survey questionnaire

Table 4. Fractional outcome regression model, autonomous motivation index (AM-index), all, men and women, dependent employees

Standard retired, confirming our [Hypothesis 1](#). According to our results, working beyond 65 years implies an increase of the index by around 0.04 unit for *Late retired* and by 0.03 unit for *Current senior workers* (or an increase of 6 and 5% respectively compared to those who retired at 65 years old). Worth noting, the impact of retiring before 65 years old (*Early retired*) on motivation is negative but not statistically significant. In other words, our results show that everything else being equal, the level of AM increases with the age of exit and is significantly higher among current senior workers.

[Hypothesis 3](#) is also confirmed by our estimations: AM increases with skill level. As shown by [Table 4](#), high-skilled workers are *ceteris paribus* more intrinsically motivated, compared to medium and low-skilled workers, an increase by, respectively, 0.128 and 0.097 unit of the index (an increase by 18.5 and 14.0% of the index). As shown by Columns 2 and 3, the impact of skill on AM appears to be stronger among women compared to their male counterparts.

We also found a positive correlation between the length of working hours and autonomous work motivation, a lengthening of working hours increases the motivation index ([Hypothesis 4](#)), but the impact is small compared to skill level or employment status (retired or still active after 65).

Both men and natives exhibit a lower level of AM, but the gender and ethnic differences, although statistically significant, are not high (respectively 1.9 and 5.5%). As expected, an autonomous job increased the AM significantly (8.0%). On the other hand, no statistically significant differences in the level of AM were found with respect to institutional sector (public sector). Worth noticing also is that the negative impact of ethnicity on motivation is restricted to women (see Column 3).

5.2 Autonomous motivations among senior workers

We now turn to the potential heterogeneity in the extent of AM among respondents still working after 65 years old (*current senior workers*). The results of our estimations are reported in [Table 5](#). As shown by the results, [Hypothesis 2](#) is confirmed, current senior workers with stronger economic constraints exhibit, *ceteris paribus*, a statistically significantly lower level of AM, a decrease of 0.09 unit of the index AM (i.e a decrease of

Variables	(1) All	(2) Men	(3) Women
Male	−0.0208**		
Foreign born	−0.0222	0.00763	−0.0438*
Medium skill	0.0809***	0.0511***	0.168***
High skill	0.108***	0.0861***	0.179***
Autonomy now	0.0506***	0.0575***	0.0403***
Cohort 1942–1945	0.00511	−0.0368	0.0621
Cohort 1946–1949	−0.0130	−0.0469**	0.0318
Current working hours	0.000111	0.000152	0.000565
Public sector	−0.0231**	−0.0261**	−0.0170
Economic constraints**	−0.0900***	−0.113***	−0.0720***
Conditional means	0.720	0.718	0.724
Observations	2,025	1,147	878

Note(s): * Statistically significant at 10% level; ** 5 %t level; *** 1% level
** Definition of economic constraints: Current senior workers who would stop working completely if they won at the lottery, and state that they continue to work due to financial considerations
Marginal Effect Estimated at Sample Means
Source(s): Own calculations, based on Register Data, LISA database from [Statistics Sweden \(2016\)](#) and our Survey questionnaire

Table 5.
Fractional outcome
regression model,
autonomous
motivation index (AM-
index), current senior
workers only, all, men
and women, dependent
employees

12.5% of the motivation index). Interesting to note is that the negative impact of economic constraints on AM is higher among men than among women (see Columns 2 and 3, 9th row).

Our third hypothesis ([Hypothesis 3](#)), i.e. that there is a positive correlation between the extent of AM and skill level is also confirmed when we restrict the sample to current senior workers, where the impact of skills on the level of AM is similar compared to the results for the sample as a whole (including retirees). As previously mentioned, skills and educational level are strong predictors of the likelihood to work after 65 years old (see [Anxo et al., 2019](#)), higher skill level significantly increasing the probability to work after 65 years old. So if current senior workers display on average a higher level of skills and are more intrinsically motivated compared to retirees, the variation in the degree of AM among current senior workers according to skill level is also significant.

Our fourth hypothesis ([Hypothesis 4](#)) that AM is positively correlated with working hours is not statistically significant. Another result worth noticing, is that male senior workers display a lower level of AM compared to their female counterparts, but the gender difference in the level of AM among senior workers is relatively small (less than 3%). It is interesting to note that the difference in AM between natives and foreign-born is only statistically significant for female senior workers (see Column 3 first row).

In contrast to the sample as a whole, a small statistically significant lower level of AM were found with respect to institutional sector (public sector) among male current senior workers. In addition, the youngest cohort of male current senior workers displays a lower level of AM by 6.5%.

We test the stability of our results in [Table 5](#) by using the alternative definition of the AM index for current senior workers (Alt-AM-index). Instead of using the item on monotonous work, we include the item on stimulating work, which was only available for current senior workers (see [Table 2](#) above). [Table 6](#) shows the result of the regressions analysis with this alternative specification of the AM-index as the dependent variable. The results reported in [Table 6](#) are largely the same as those reported in [Table 5](#). The effects of level of skill on AM are very close to the previous ones. The effects of current working hours remain not statistically significant, and the effect of economic constraints remain statistically significant

Variables	(1) All	(2) Men	(3) Women
Male	-0.0301***		
Foreign born	-0.0156	0.0246	-0.0437
Medium skill	0.0886***	0.0559***	0.173**
High skill	0.109***	0.0888***	0.171***
Autonomy now	0.0509***	0.0578***	0.0412***
Cohort 1942–1945	0.00617	-0.0477*	0.0765
Cohort 1946–1949	-0.0222	-0.0719***	0.0481
Current working hours	5.22e-05	0.000334	0.000122
Public sector	-0.0258**	-0.0277**	-0.0189
Economic constraints**	-0.104***	-0.121***	-0.0925***
<i>Conditional means</i>	0.710	0.705	0.719
Observations	2,043	1,152	891

Note(s): * Statistically significant at 10% level; ** 5 % level; *** 1% level

** Definition of economic constraints: Current senior workers who would stop working completely if they won at the lottery, and state that they continue to work due to financial considerations

Marginal Effect Estimated at Sample Means

Source(s): Own calculations, based on Register Data, LISA database from [Statistics Sweden \(2016\)](#) and our Survey questionnaire

Table 6.
Fractional outcome
regression model,
alternative
autonomous
motivation index (Alt-
AM-index), current
senior workers only,
all, men and women,
dependent employees

and stronger for men than for women. However, the negative effect of foreign-born women on AM found in [Table 5](#) is no longer statistically significant.

6. Concluding remarks

Our analysis tends to show that autonomous work motivation is positively correlated with working at old age. From previous research, we know that good health, high educational attainment/skills, continuous work trajectory and high average life income are strong predictors of working after the standard age of retirement (See [Anxo et al., 2019](#)). In the present study, we found that the extent of autonomous motivation (AM) is significantly higher among current senior workers (age 65 and older) compared to individuals retiring at 65 years old or earlier. At first sight, this result seems counter intuitive, as financial motives should play a central role in the decision to work after the standard age of retirement, and hence extrinsic motivation could be expected to dominate. One way of understanding this result is that retirement increasingly seems to require an active choice from the employee. Sweden is a good illustration of a country where the age of retirement has become to a large extent an individual decision and where a standard age of retirement (age 65), no longer constitutes the social norm for retirement for employees, employers, social partners or co-workers. Retirement becomes an individual trade-off for the worker between, on the one hand, benefits of increasing leisure and available income from pension benefits and, on the other hand, costs of leaving an active work life that can be rewarding both in terms of labour income and through social contacts and identity. An individual with a low degree of autonomous work motivation will find that the benefits of retirement at a younger age outweigh the costs compared to a worker with a higher degree of autonomous work motivation. Hence, AM is more common and higher among senior workers.

In addition, we found that the degree of AM among senior workers decreases when a person continues to work due to financial constraints/restrictions. This result follows directly from the previous one: If the income from pension benefits and pension savings is low, then an individual with a low degree of AM finds the benefits of retirement (in terms of pension income and leisure) *lower* than the costs of retirement (in terms of loss of labour income) and therefore continues to work.

Consistent with this reasoning, we found that AM is more frequent among high-skilled workers. We argue that this can be expected, as jobs with higher skills are often associated with greater work autonomy, which in turn augments AM. In addition, investments in education and training at a younger age may reflect a selection mechanism where people who are autonomously motivated to work choose to invest more in human capital.

Our findings also add to previous qualitative studies on retirement-aged workers ([Bratun et al., 2022](#)). It has been found that sense of autonomy is a central component of work at retirement age, which is consistent with our finding that intrinsic motivation is higher among senior workers. In addition, motives related to helping others and non-material rewards of prolonged labour engagement, such as the development and training of younger generations, are also found. This indicates that AM is a central component of prolonged working life.

A limitation of this study is the relatively few questions related to work motivation that were included in our survey. More items could be added in order to capture additionally relevant dimensions of the AM of senior workers. For example, their work motivation could be affected by experienced exposure to economic and/or health shocks. Work motivation could also be dependent on how they experience their importance and role in the organisation where they are working. It is also possible that measured aspects of AM in our survey are weighted differently by individuals. Furthermore, it is possible that some answers in the survey are affected by a social desirability bias, where current senior workers may not want to reveal that their work is sometimes monotone or that they do not feel enriched by their

work. Retired individuals, on the other hand, may tend to downplay their past work by exaggerating their perceived monotony and lack of engagement. Finally, respondents' interpretation of completely agreeing to statements in the survey may be a more extreme view than for others. Future studies should consider these challenges when they measure autonomous work motivation of senior citizens.

The use in the future of longitudinal data could make it possible to better identify and assess the causal impact of autonomous work motivation on the ability and willingness to postpone retirement. Longitudinal studies make it possible for example to use the Multidimensional Work Motivation Scale (MWMS) (Gagné *et al.*, 2015) in order to measure the degree of autonomous work motivation both before and after the standard age of retirement. If a higher level of AM before the retirement age increases the probability of work at retirement age, then it can be concluded that AM is an important factor influencing senior citizens' decision to continue working.

Two main policy recommendations can be derived from our study: we have seen that individuals who continue to work after 65 are mostly motivated by the satisfaction they derive from their job. Job satisfaction is strongly related to skill level, job quality, job content and job autonomy. Our results indicate that job quality and commitment to work are essential elements for motivating seniors to postpone retirement. Consequently, one policy recommendation would be to continue to invest in the overall education/skill levels of the population and to promote skill-enhancing measures that enable persons with low education and routine-jobs to invest in training, through for example life-long learning facilities either in the form of on-the-job training and/or formal education. Also, work organisation that promotes employees' job autonomy regarding *inter alia* working hours and work content seem to be important factors influencing the extent of intrinsic motivation and the willingness of senior citizens to stay longer in the workforce and therefore should be favoured. One way for practitioners to achieve these goals could be to increase the use of older workers as mentors and instructors to younger workers, which helps to increase the investment in the training of younger workers but also may enhance the older workers' sense of autonomy and intrinsic work motivation. From the demand side, measures favouring an overall upgrading of the skill structure via innovations, investment in research and development, new technologies as well as improvement in work organisation and working conditions should be privileged.

Notes

1. Individuals born in 1958 or earlier could draw pension benefits at age 61.
2. There are three components in the Swedish statutory public pension system: income pension, based on a person's full lifetime earnings and financed on a pay-as-you-go basis; premium pension, which is a smaller and funded part of the income-based pension; and guarantee pension which provides a basic income for all persons, irrespective of their previous lifetime earnings. The statutory pension system is complemented by collectively bargained occupational pension schemes, which cover about 90% of the workforce.
3. Individuals born in 1958 or earlier could draw pension benefits at age 61.
4. As the survey took place two years later, in 2014, a part of the 15,000 individuals had left the labour market.
5. An analysis of the non-responses shows that the response rate was globally not affected by age, gender and income level. Highly educated, wage earners and natives were however more prone to participate in the survey than low educated, self-employed and foreign-born. The relative overrepresentation of some groups was not of major concern for the external validity of the survey, since Statistics Sweden supplied sampling weights compensating for stratification, coverage and non-response. After the elimination of some questionnaires not filled in accurately and/or obviously

incoherent with limited answers to the questions in the survey, the final sample amounts to 12,400 observations.

6. The fractional outcome regression technique is a variant of the binary probit model with that difference that the independent variable y can actually take on values in the unit interval $[0,1]$. (see Papke and Wooldridge, 1996).

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Table A1.
Definition of variables
used in the study
retrieved or created
from our questionnaire
survey or based on
[Statistics Sweden](#)
[\(2016\)](#) LISA register
data if not specified in
the table

Appendix	
Variables	Definition
Current senior worker	Current active senior workers age 65 or older, dummy, questionnaire
Late retired	Retired respondent, but have been active after 65, dummy, questionnaire
Standard retired	Retired at 65 years old, dummy, questionnaire
Early retired	Retired before age 65, dummy, questionnaire
Public sector	Work or worked in the public sector, dummy, register data (LISA) and questionnaire
Cohort 1938–1941	Respondent born between 1938 and 1941, dummy, register data (LISA)
Cohort 1942–1945	Respondent born between 1942 and– 1945, dummy, register data (LISA)
Cohort 1946–1949	Respondent born between 1946 an d1949, dummy, register data (LISA)
Foreign born	Respondent born outside Sweden, dummy, Register data (LISA) and questionnaire
Low skill	Swedish ISCO classification (SSYK, 3 digits level, code ≥ 745), register data (LISA)
Medium skill	Swedish ISCO classification (SSYK, 3 digits level, code 311–744), register data (LISA)
High skill	Swedish ISCO classification (SSYK, 3 digits level, code ≥ 249), register data (LISA)
Autonomy	Respondent fully agrees on two statements: “I could influence when (how) my work could be done”
Economic constraints	Senior workers who report they would stop working completely if they won at a lottery, SEK 5 million (€ 500,000) and at the same time agreed completely to the statement “Economic considerations were a strong motive to continue to work (after age 65)”, dummy, questionnaire
Source(s): Author’s own work	

						Intrinsic and extrinsic work motivation
Variables	(1) All	(2) Early retired	(3) Retired at 65 years	(4) Late retired	(5) Current senior worker	
<i>Demographics</i>						
Age of the respondent	68.8	69.6	68.5	69.7	68.0	
Male	0.56	0.46	0.47	0.62	0.63	
Foreign born	0.09	0.08	0.08	0.08	0.09	
Cohort 1939–1941	0.17	0.24	0.17	0.19	0.10	
Cohort 1942–1945	0.29	0.33	0.24	0.38	0.26	
Cohort 1946–1949	0.54	0.43	0.59	0.43	0.64	
<i>Skills</i>						
Low skill	0.11	0.10	0.12	0.09	0.10	
Medium skill	0.57	0.65	0.62	0.54	0.49	
High skill	0.32	0.25	0.26	0.37	0.41	
<i>Employment status</i>						
Wage earner, bef*	0.71	0.74	0.84	0.69	0.60	
Self-employed, bef*	0.20	0.08	0.08	0.22	0.34	
Combiners, bef*	0.04	0.03	0.02	0.05	0.05	
Out of the labour force, bef*	0.05	0.15	0.06	0.04	0.01	
Wage earner, now	–	–	–	–	0.56	
Self-employed, now	–	–	–	–	0.40	
Combiners, now	–	–	–	–	0.04	
<i>Working conditions and environment</i>						
Weekly working time bef*	39.8	38.8	38.3	40.3	41.1	
Weekly working time now	–	–	–	–	29.7	
Public sector	0.32	0.33	0.39	0.33	0.27	
Note(s): * “bef.” means before the actual age of exit from the labour force or at 64 years old for still active senior workers (Current senior workers)						
Source(s): Own calculations, based on Register Data, LISA database from Statistics Sweden (2016) and our Survey questionnaire						

Table A2.
Descriptive statistics,
Mean, Total sample
(All), Retired before age
65 (Early retired),
Retired at 65 years,
retired after age 65
(Late retired) and
currently working after
age 65 (Current senior
worker)

Table A3.
Working conditions
and job characteristics
for retirees and current
senior workers, Men
(M) and Women (W), in
per cent

Retirees	Good cohesion and atmosphere		Hang out with co-workers		Personal commitment		My work is monotonous		Stimulus and enrichment	
	M	W	M	W	M	W	M	W	M	W
<i>Agree</i>										
- Completely	63.6	54.4	11.5	15.8	48.6	52.0	4.3	3.9	n.a.	n.a.
- Partially	27.5	36.5	52.1	54.0	31.2	27.9	18.7	18.5	n.a.	n.a.
- Not at all	4.2	6.1	30.0	28.8	13.5	13.0	74.5	75.3	n.a.	n.a.
- Don't know	4.7	2.9	6.4	4.3	6.6	7.1	2.4	2.3	n.a.	n.a.
Number of observations	4,133	3,673	4,112	3,647	4,010	3,522	4,066	3,593		
Current senior workers										
	M	W	M	W	M	W	M	W	M	W
<i>Agree</i>										
- Completely	64.4	60.1	9.23	12.5	69.2	73.8	2.5	2.5	71.33	76.4
- Partially	29.3	34.3	41.6	49.1	25.7	23.0	14.6	14.4	25.3	21.1
- Not at all	6.3	5.6	49.1	38.4	3.4	1.8	82.9	83.1	1.9	1.8
- Don't know	—	—	—	—	1.7	1.4	—	—	1.5	0.6
Number of observations	1,346	1,073	1,333	1,063	1,376	1,081	1,352	1,064	1,381	1,085
Note(s): Good cohesion and atmosphere: “The cohesion and atmosphere is/was good at my workplace”; Hang out with co-workers: “I usually/used to hang out with my co-workers after work”; Personal commitment: “I feel a great personal commitment in my work”; My work is monotonous: “My work is/was monotonous”; Stimulus and enrichment “I feel that my work stimulates me and enriches me”										
Source(s): Own calculations, based on our Survey questionnaire										

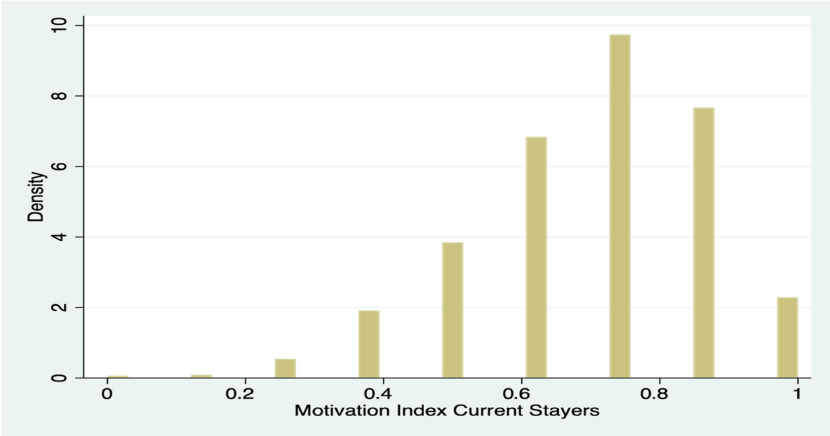


Figure A1.
Distribution of the AM-
index, current senior
workers dependent
employees

Note(s): Number of observations = 2,118; weighted mean = 0.71; median = 0.75, Standard deviation = 0.18;
Source(s): Own calculations, based on Register Data, LISA database from Statistics Sweden (2016) and our Survey questionnaire