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Earnings trends among older employees in England and Wales, 1972–2001

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ABSTRACT
This article considers the hypothesis that 'older people in full-time employment normally receive earnings below the level previously enjoyed', by examining the money and real earnings of older British full-time employees as they age. After a review of the factors that influence earnings, data from the *New Earnings Survey* of Great Britain are used to estimate average gross weekly money and real earnings of two cohorts of manual and non-manual workers as they age. The two cohorts were born respectively in 1927 and 1937, and male and female employees are considered separately. The estimates are used to develop time series age-earnings profiles of real earnings. These suggest that the average full-time older employee normally benefits over time from rising real earnings as a consequence of increases in national prosperity, although the increases vary by gender, occupational group and cohort. Older female employees benefited more than males from significantly higher percentage increases in their average real earnings, and between 1981–2000 average real earnings in non-manual occupations rose relative to manual workers' earnings.

KEY WORDS – older workers, earnings, income, age-relationships, money earnings, real earnings, time series, trends.

Introduction

Older employees have to choose whether to remain in full-time or part-time employment or withdraw from the labour force. Although the relationship between age and earnings significantly influences older peoples' labour market participation, and the employment experiences of older people are well documented, less attention has been given to their anticipated earnings from continued employment (see Campbell 1999). If, for example, anticipated earnings are below the minimum level at which they are willing to offer themselves on the labour market (their 'reservation wage'), they will be discouraged from entering employment; while if they

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attracted high wages, that would encourage employers to hire younger, cheaper workers. The age-earnings relationship therefore has implications for both the supply of and the demand for labour, as well as for the employment opportunities of older people. Furthermore, for a large minority of older employees who contribute to final salary pension schemes, earnings during their last working years have long-term implications. As a World Bank study (1994: 84) noted, 'an employee's pension often depends directly on their wages, especially in the last years of employment'. Should earnings decline prior to retirement, a reduced pension entitlement could result.

This article examines the earnings of older people in full-time employment against the changing demand for and supply of older workers. The hypothesis considered is that 'older people in full-time employment normally receive earnings below the level previously enjoyed'. The paper comprises four further sections: the first briefly notes relevant labour market data for 50-64 year olds. The subsequent section examines the factors thought to influence the earnings levels of older employees. In the final sections, the data are described and the time series age-earnings profiles for two cohorts of ageing employees are estimated and discussed.

Labour market data for 50-64 year olds

Each year in Great Britain since 1972, the *New Earnings Survey* (NES) has collected information from employers on the age, gender, hours worked, weekly earnings, industry and occupation of a one per cent sample of employees (Office of National Statistics, 1972- annual). The sample is identified from employees' National Insurance numbers: those whose numbers end with a specified two digits are included. Two methods are used to identify the employees and their current employer. Around 90 per cent of the sampled individuals are identified from Inland Revenue data on individuals with the appropriate National Insurance numbers. The remaining 10 per cent are obtained directly from large employing organisations. The representation of full-time employees is thought to be very good, although Dickens (1996) has suggested that employees in small firms and in firms that experience a high rate of turnover may be underrepresented.

Data on the size of the male and female populations aged 50–64 years in Great Britain for selected years are displayed in Table 1, along with the number of economically active older people, which includes full-time and part-time employees, the self-employed and registered unemployed. The relevant activity rates are shown. Until the 1990s, the number of

TABLE 1. *Total and economically active population of men and women aged 50–64 years (thousands)*

Age and sex	1971	1981	1991	2001
Males aged 50–64 years				
Economically active	4,278	3,853	3,228	3,507
Activity rate (%)	*93.2*	*87.9*	*75.7*	*71.0*
Total	4,592	4,384	4,262	4,951
Females aged 50–64 years				
Economically Active	2,312	2,162	2,081	2,732
Activity rate (%)	*46.1*	*46.5*	*47.3*	*53.8*
Total	5,017	4,646	4,401	5,070

Source: Data for 1971, 1981 and 1991 taken from the Census of Population of England and Wales; data for 2001 derived from the Labour Force Survey. Whilst the two data sources differ the high sampling rate for the Labour Force Survey (10%) would suggest there is a high degree of comparability.

50-64 year olds was declining, but the trend has subsequently reversed. Nevertheless there are now fewer economically active older males than in 1971, and their economic activity rate has fallen by 22 percentage points. During the same period, despite an initial decline in the number of economically active older females, their economic activity rate has increased. The total number of economically active older people has declined over the last 30 years, and their representation in the nation's labour force has fallen.

Influences on the level of earnings

Endogenous variables

Economic theories of wage determination assume that employers hire additional workers to the point at which the value of the last (marginal) individual's contribution to output, the marginal revenue product, is equal to the marginal cost of employing that worker. For simplicity, such theory predicts that older employees will receive a wage equal to the value of their output. Frank (1984), however, believed that reality differed from theory, and that an individual's earnings are influenced less by their marginal revenue product than by their education, training and current job. He argued that employers do not normally match earnings with productivity because of the difficulty of estimating the value of an individual's contribution to output, and that remuneration strategies are not related to an individual's productivity but rather to the perceived value to the employer of the job tasks they undertake. This approach was supported by Disney (1996), who reported the common practice of grouping jobs into a hierarchical structure with differentiated levels of pay. The implication is that

the earnings of older people are determined more by the job that they hold than by their performance in that job or their contribution to output.

Some observers contend that there is a link between the job in which an individual is employed and their education or training, because employers perceive acquired qualifications and training as a proxy for the abilities required to undertake specific job tasks at a specified wage. The implication is that investment in human capital determines the job obtained, and the job determines the employee's earnings. This approach also provides an explanation of why annual earnings vary over a lifetime. During the early years of employment, earnings rise as an individual's human capital, in the form of training and experience, increases. Later in the employment career, earnings peak and then, as Klevmarken (1993) has suggested, earnings decline because the value to an employer of the previously acquired human capital decreases. Whilst the human capital approach offers an explanation for the decline in earnings of older employees, those earnings will also be influenced by exogenous variables such as economic growth and inflation.

Exogenous variables

Important facets of the heterogeneity of a nation's labour force are that new cohorts of employees enter the labour force annually, and that over time the educational attainment of succeeding cohorts expands and changes, investment in human resources being a prerequisite of economic growth. Phelps Brown (1977) reasoned that this 'churning' of the labour force, by which new cohorts have superior qualifications to those withdrawing, offered an explanation for the decline in the earnings of older employees that had been observed in cross-sectional profiles. He anticipated that each new cohort entering employment would expect to receive higher earnings than preceding cohorts, to reflect their greater human capital. Developing this approach, Andrisani and Daymont (1987) contended that the larger human capital investment received by successive cohorts facilitated continuing economic growth, with the consequence that later cohorts would receive higher earnings than their predecessors.

It remains possible that the earnings of older employees decrease as they age, although both Carliner (1982) and Creedy and Hart (1979) have argued that this is unlikely. Carliner's reasoning was that while individuals might experience some deterioration in their physical abilities and human capital investment, any potential loss of income as a result of greater age would be cancelled out by productivity gains in the economy. Filter *et al.* (1996) developed this argument by suggesting that, even after allowing for

inflation, economic growth would normally result in an individual's real earnings rising throughout their working life. Johnson and Neumark (1996) found that earnings did decline but only when employees reached their sixties.

The *monetary* earnings of older employees have been much influenced by inflation over the last 70 years. Thus, any comparison of the actual money earnings of older employees over time reveals an increase as a result of inflation. If simply interpreted, this observation would lead to the rejection of the hypothesis that 'older people in full-time employment normally receive earnings below the level previously enjoyed'. Clearly, it is imperative to remove the effects of inflation, and to compare *real* earnings over time.[1]

Estimated real earnings profiles for ageing employees

The NES also provides particulars of gross earnings for manual and non-manual jobs before pay deductions by age and gender. The annual data on age and earnings are obtained from an evolving sample: once an individual is sampled for the survey, they are included in all subsequent annual enquiries if economically active, and those who die or withdraw from the labour force are replaced by newly sampled recruits. Elias and Gregory (1994) considered that the data 'appears to give an accurate representation of long-term trends in earnings in the aggregate'. Nevertheless, any conclusion based on a comparison over time of cross-sectional age-earnings profiles will be misleading as a result of the higher qualifications of succeeding cohorts, economic growth and inflation. To establish whether an average employee's *real* earnings change over time it is necessary to derive time series age-earnings profiles for each employee cohort as they age.

The NES data may be utilised for this purpose, because it reports the earnings of a unique group of individuals who, while they continue in employment, remain in successive annual surveys. This continuous nature of the NES sample and the earnings data therefore allow estimates to be made, with inflation adjustments, of the real earnings of specified age cohorts over time. In other words, time series profiles for specified cohorts can be constructed from successive annual NES reports (although with the aid of some linear interpolation).[2] These profiles reveal whether the anticipated increases in earnings associated with economic growth outweigh the potential earnings decline that older employees are thought to experience. The two time series age-earnings profiles in Figure 1 depict the development of the average gross weekly *real* earnings received by

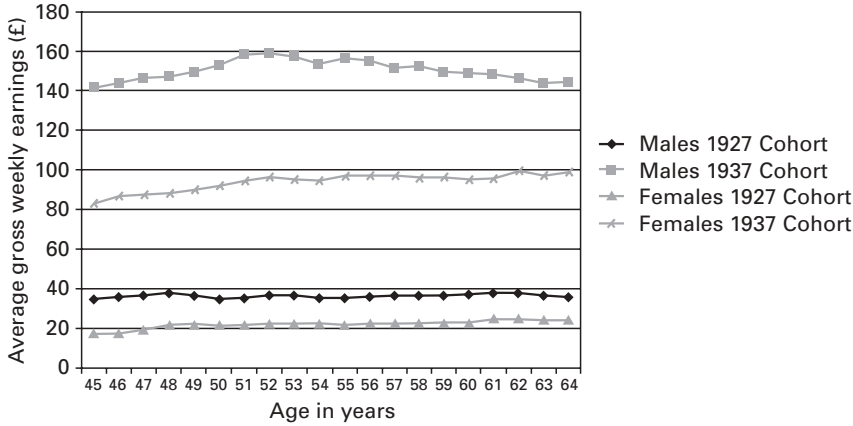

Figure 1. Average gross weekly earnings for manual workers aged 45–64 years.

TABLE 2. *Estimated average gross weekly money earnings (£) at 45 and 64 years and estimated average gross weekly real earnings at age 64 years*

	Estimated money earnings		Estimated real earnings
Cohort group	45 years	64 years	64 years
Males: manual			
1927 cohort	34.9	221.3	35.7
1937 cohort	141.3	314.4	149.2
Males: non-manual			
1927 cohort	50.4	317.2	51.2
1937 cohort	203.0	520.0	239.7
Females: manual			
1927 cohort	17.5	151.0	24.4
1937 cohort	83.0	215.2	99.2
Females: non-manual			
1927 cohort	28.4	215.1	34.7
1937 cohort	116.1	332.9	153.5

Source: Estimated from New Earnings Survey, 1972, 1982, 1991 and 2001.

cohorts of average full-time employees born respectively in 1927 or 1937. The profiles are based on estimated values of gross weekly real earnings of average male and female employees in manual occupations as they age from 45 to 64 years, which for the two cohorts cover 1972–91 and 1982–2001 (Table 2).

The profiles reveal that it was normal for the average employee's gross weekly real earnings to increase from year to year although there were exceptions, notably the experience of males in the 1937 cohort as they

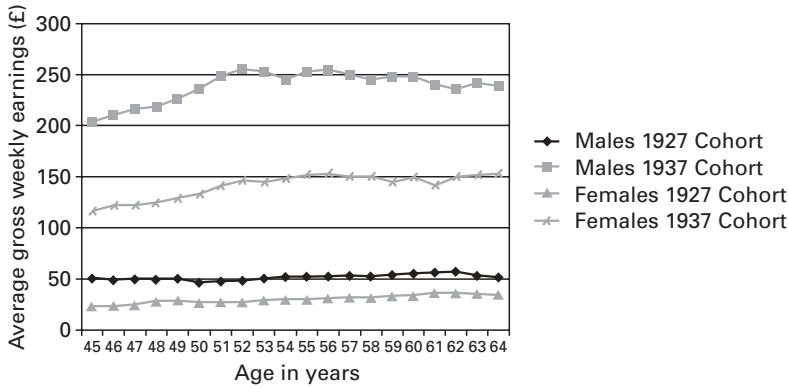

Figure 2. Average gross weekly earnings for non-manual workers aged 45–64 years.

passed the age of 56 years (*i.e.* during the years 1993 to 2001). It is also clear that the 1937 cohort members received higher real earnings than those in the earlier cohort. These higher earnings arose from several inter-related factors. First, as Phelps Brown suggested, the 1937 cohort received the benefit of their greater investment in human capital. Secondly, as Andrisani and Daymont anticipated, the higher investment in human resources facilitated economic growth and an increase in the nation's prosperity. Whilst 64-year-old employees received higher gross weekly real earnings than 20 years previously, the increases varied by cohort, gender and occupational group. The comparison by occupational group can be seen by comparing Figure 2, which gives comparable data for non-manual workers, with Figure 1.

Members of the 1927 cohort who were in employment at the age of 64 years on average received increases in their gross weekly real earnings until the final years of their employment. The earnings peak for the average male in the 1927 cohort was at 61/62 years of age, while females reached their peak earnings when aged 62/64 years. These peaks occurred later than is usually assumed, and the profiles do not conform to the human capital theory model which suggests that earnings peak many years prior to retirement. They more closely follow the pattern described by Johnson and Neumark. By contrast, men in non-manual occupations in the 1937 cohort in non-manual occupations again suffered declining real earnings in their later working lives and reached their peak earnings when aged 55/56 years, the same age as for male manual workers. On the other hand, the average female employee continued to receive increases in real earnings until their early sixties. It should be noted, however, that the 1937 cohort reached the mid-fifties during the early 1990s, a period when

TABLE 3. *Peak ages and years for average gross weekly earnings*

Cohort group	Peak age (years)	Peak year
Males: manual		
1927 cohort	61	1988
1937 cohort	55	1992
Males: non-manual		
1927 cohort	62	1989
1937 cohort	56	1993
Females: manual		
1927 cohort	64	1992
1937 cohort	62	1999
Females: non-manual		
1927 cohort	61	1998
1937 cohort	56 (64)*	1993 (2001)*

Source: Estimated from New Earnings Survey, 1972, 1982, 1991 and 2001.
Notes: * Indicates two years when peak earnings were equal.

retirement before the statutory pension age (currently 65 years for men) was becoming much more socially acceptable and frequent. Nevertheless, as Carliner predicted, even after the age of peak earnings, the profiles for older males, especially non-manual workers, suggest that their subsequent real earnings benefited from productivity gains in the economy.

The timing of peak earnings

Table 3 shows both the ages and calendar years at which earnings peaks occurred. The peak earning ages will be determined by the factors discussed above while the peak years will largely be determined by macroeconomic conditions. Table 3 shows that the peak years occasionally coincide for the two cohorts. For example, 1992 was the peak earnings year for both male manual workers in the 1937 cohort and female manual workers in the 1927 cohort. Similarly there was some 'crossing over' in 1998/99. Peak earning ages are thus determined by a combination of age, occupation and the general health of the economy. The age at which an individual's earnings peak will determine the duration of earnings decline prior to 65 years of age, and the experience of the two cohorts differed. The average real earnings of both males and females in the first (1927) cohort, and of females in the second, declined only in the final two years of employment. However, males in the 1937 cohort experienced, with occasional upward movements, several years of declining real earnings although this was hidden by the increases in their money earnings.

Nonetheless, male employees who remain in employment into their sixties received higher average gross weekly real earnings than female

employees of the same age. Recently, though, the gross weekly real earnings of older women have increased relative to those of men. For example, between 1972 and 1991, while the real earnings of men in the first cohort rose by two per cent, the corresponding increase for women was 40 per cent. These differential increases may be attributed to exogenous factors associated with the changing labour market position of women relative to men and the implementation of the equal pay and opportunities legislation.

Cohort change

In recent decades, while aggregate employment has increased, the significance of manufacturing as the principal source of manual work has declined. This decline and the increased employment in non-manual jobs did not seemingly influence the gross weekly real earnings of employees in the 1927 cohort, for in the last years of 1972–91, manual and non-manual employees were receiving similar percentage increases in real earnings, although there were gender differences. The experiences of the later cohort differed, however, for the percentage increase in real earnings for non-manual employees was significantly higher than for manual workers. Employers appear to have been slowly adjusting their remuneration polices to reflect changes in labour demand.

An examination of the time series of age-earnings profiles reveals that the average older employee received higher real earnings at the conclusion of their working lives than 20 years earlier, although in the majority of instances real earnings did decline during the final years of their employment. The declines in average gross weekly real earnings were usually small when compared to the continuing increases in money earnings. For example, as the real earnings of the average non-manual male in the 1937 cohort declined from their peak by six per cent in the eight years to their 65th birthday, the average gross weekly money earnings rose by 16 per cent. For the average employee in each of the cohorts who remained in full-time employment until 65 years, over the final 20 years of their employment increases in their money and real earnings normally occurred.

The data could, in principle, be affected by selective withdrawal from the labour force before the statutory pension age. If those on lower earnings tend to withdraw earlier than others, then there will be a tendency for average earnings in later life to rise. If, on the other hand, the reverse is true and those on higher earnings tend to withdraw earlier, then the tendency will be a tailing off of average earnings for people who remain in work in their late fifties and early sixties. There are however two major offsetting economic effects. On the one hand, those on lower earnings may

have a greater incentive to leave employment early. Their reservation wage will be influenced by their expectations of future earnings and these may be below, or not significantly greater than, the income they can derive from benefits and non-paid work. On the other hand, those on higher earnings have greater wealth to rely on in later years (including occupational pensions) and may have more opportunities to retire earlier. As noted above, those who withdraw from the NES panel are replaced by new recruits of the same age, gender and broad occupational category, so the potential bias from selective withdrawal is minimised.

Conclusions

This article has examined the earnings over two decades of two cohorts of workers as they aged against the background of economic growth, inflation and an evolving labour market for older people. It has been noted that price inflation has resulted in increases in the average gross weekly money earnings for all employees. The more significant finding, however, is that the average gross weekly *real* earnings of older employees also increased, a benefit of the nation's economic growth and rising prosperity. Nevertheless, while the average member of the 1927 cohort experienced increases in their real earnings until after the age of 60 years, the real earnings of the average male in the 1937 cohort declined over the final decade of their working lives, even though their money earnings continued to rise.

Britain has, over, the last 30 years, experienced unprecedented changes in the employment opportunities of older people. As the labour market for older employees evolved between 1971 and 2001, the economic activity rate for 50-64 year old males declined by 22 percentage points, while the female economic activity rate increased by eight percentage points. These changes in the level of labour force participation of older people provide the background against which to evaluate earnings trends. The findings of this study suggest that changes in both the money and the real earnings of older employees can only be partially explained by labour market changes. Rather, as Frank and Disney contended, the findings suggest that it is the job that employees hold and the pay structure of organisations, not an individual's age, that determines their money and real earnings. When an employer considers that employees are satisfactorily fulfilling the requirements of a specified job, those employees receive the relevant pay rate for the job regardless of their age. Should an older or a younger employee's job performance prove unsatisfactory, their employment will be terminated. They are unlikely to retain the job at a lower wage.

The paper has examined the hypothesis that 'older people in full-time employment normally receive earnings below the level previously enjoyed'. When the average gross weekly money earnings of the two cohorts were estimated, the hypothesis had to be rejected. But when the estimated average gross weekly *real* earnings of employees are considered, it has to be accepted. Nevertheless, caution is required: the findings relate to an 'average' employee receiving 'average' earnings. In both cohorts there will have been some employees, including those in 'bridge' jobs (jobs taken between leaving long-term career positions and retirement) whose earnings during their final years of employment were below the average, and whose real if not money earnings declined as they aged. There were, however, other employees whose money earnings rose faster than the average. In this group, real earnings may also have increased as they aged.

NOTES

1 If real earnings are compared between years 'A' and 'B' and are found (a) to increase, then the benefits of economic growth exceed the decline in strength and acuity; (b) to remain constant, then the benefits of economic growth equal the decline in strength and acuity; or (c) to decrease, then the declines in strength and acuity exceed the benefits of economic growth.

2 The average gross weekly *money* earnings (W) in any year for the two cohorts as they aged respectively from 45 to 54 years, and from 55 to 64 years, were estimated as follows:

$$W_n = W_{n-1} + \Delta W$$

where W is the weekly money earnings of an average employee, n is the age of an average employee, and $\Delta W = 1/10\,(W_a - W_b)$ with subscript a being either 54 or 64 years of age, and subscript b either 45 or 55 years of age respectively. The estimated average gross weekly *money* earnings were affected by inflation. During 1972–1991, the Retail Price Index (RPI) rose from 100 to 620, and during 1982–2001 it more than doubled. To estimate average gross weekly *real* earnings, estimated money earnings were deflated to take account of inflation as measured by the RPI, so that:

$$W_r = W_n(I_o/I_x)$$

where W_r is the weekly *real* earnings of an average employee aged between 45 and 64 years, I_o is the value of the RPI for April 1972 or 1982 (the base year), and I_x is the value of the RPI in April for the individual years 1973 to 2001.

References

Andrisani, P. and Daymont, T. 1987. Age changes in productivity and earnings among managers and professionals. In Sandell, S. H. (ed.), *The Problem Isn't Age: Work and Older American*. Praeger, New York, 52–70.

Campbell, N. 1999. *The Decline of Employment Among Older People*. Centre for Analysis of Social Exclusion, London School of Economics, London.
Carliner, G. 1982. The wages of older men. *Journal of Human Resources*, **17**, 25–38.
Creedy, J. and Hart, P. 1979. Age and the distribution of earnings. *Economic Journal*, **89**, 280–93.
Dickens, R. 1996. *The Evolution of Individual Male Earnings in Great Britain: 1975–94*. Centre for Economic Performance, London School of Economics, London.
Disney, R. 1996. *Can We Afford to Grow Older?* MIT Press, Cambridge, Massachusetts.
Elias, P. and Gregory, M. 1994. *The Changing Structure of Occupations and Earnings in Great Britain: 1975–1990*. Institute of Employment Research, University of Warwick, Warwick.
Filter, R. K., Hamermesh, D. S. and Rees, A. E. 1996. *The Economics of Work and Pay*, 6th Edition. Harper Collins College Publishers, New York.
Frank, R. F. 1984. Are workers paid their marginal product? *American Economic Journal*, **74**, 549–71.
Johnson, R. W. and Neumark, D. 1996. Wage declines among older men. *Review of Economics and Statistics*, **78**, 740–8.
Klevmarken, N. A. 1993. On ageing and earnings. In Johnson, P. and Zimmerman, K. F. (eds), *Labour Markets in an Ageing Europe*. Cambridge University Press, Cambridge, 151–81.
Office of National Statistics 1972- (annual). *New Earnings Survey: Part E*. Stationery Office, London.
Phelps Brown, E. H. 1977. *The Inequality of Pay*. Oxford University Press, Oxford.
World Bank 1994. *Averting the Old Age Crisis*. Oxford University Press, Oxford.

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