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THE INEQUALITY OF EMPLOYMENT AND SELF-EMPLOYMENT INCOMES: A DECOMPOSITION ANALYSIS FOR THE U.K.

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U.K. employment and self-employment income inequality are analysed over 1979-94/95. Robust inequality decompositions reveal occupation to be a relatively important and hitherto neglected determinant of earnings inequality. In contrast, self-employment income inequality is harder to explain, although occupation is also the most important single factor in the mid-1990s. The paper also provides a novel implementation of a decomposition of *changes* in Kolm's inequality index.

1. INTRODUCTION

One of the most widely used techniques used to explain inequality is the decomposition of inequality measures across population sub-groups. Decomposition of an inequality measure involves partitioning the income-receiving population into groups defined by some characteristic (e.g. gender), and then identifying the amount of aggregate inequality due to inequality within groups, and the amount due to differences between groups. The greater the "between" group component, the greater the explanatory power of the characteristic used in the partition. Following earlier theoretical work that established the sub-set of inequality measures amenable to decomposition (Shorrocks, 1980; Cowell, 1980), numerous studies have utilised this technique for a range of different economies, time periods, and data-sets.

Previous studies have usually decomposed inequality of incomes, broadly defined. However, the following reasons suggest why it would be useful to separately analyse the two largest income sources, employment and self-employment incomes. First, the self-employed are known to be fundamentally different from employees, in their characteristics, the way their income is generated and reported, and in their degree of income inequality. In particular, it is known that the inequality of self-employed and employees' incomes evolved in different ways in the 1980s (Jenkins, 1995). Thus aggregating the incomes of these different groups could disguise important structure within them. Second, the self-employed are of considerable interest in their own right, especially in view of their importance in explaining growing U.K. inequality in the 1980s. Third, it may be easier and more efficient for policy-makers to address inequality in particular sources of income than for a broad measure of aggregate income.

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As well as analysing U.K. self-employment and employee incomes separately, this paper also makes the following contributions. First, it examines a relatively large number of possible determinants of inequality. Second, several different inequality measures are decomposed, for comprehensiveness. Third, a novel decomposition of the changes in one particular measure of interest is performed. All results are based on U.K. *Family Expenditure Survey* (FES) data over 1979–94/95.

The paper is organised as follows. The relevant literature is briefly reviewed in Section 2. Three inequality measures, their decompositions, and their relative merits are described in Section 3. The data-set is described in Section 4, and the decomposition results are presented in Section 5. Section 6 concludes.

2. Previous U.K. Studies

2.1. *Self-employment Income Inequality*

In the U.K., comparisons of frequency distributions and inequality measures reveal that self-employment incomes are more dispersed than incomes of employees, with a "fatter" tailed distribution.[1] The inequality of self-employment incomes increased sharply over the 1980s (Meager *et al.*, 1994; Parker, 1997). Explanations of why this occurred have been relatively scarce, though descriptive work by Meager *et al.* (1994) suggests that many of the new entrants to self-employment in the 1980s possessed different characteristics to existing self-employed workers. Some support for this proposition has been advanced in work by Parker (1997), who fitted a Pearson Type VI distribution to the self-employment income distribution between 1976 and 1991. Using FES data, the estimated parameters of the distribution changed in a way consistent with the proposition of increasing heterogeneity of the self-employed. However, that study did not search for the precise dimensions of heterogeneity responsible for the increase in inequality.

Some light has been shed on this issue by Meager *et al.* (1996), who estimated logit regressions using a sample of 1991 British Household Panel Survey data. These authors found that gender, part-time/full-time work status, age, industrial sector, education and occupation all significantly affected the probability of a worker ending up in the top decile of the *overall* income distribution. However, only gender, work status and industrial sector were significant in the bottom decile regression; and even after controlling for these factors, over-representation of the self-employed in the tails of the overall income distribution remained. The inequality of self-employment income itself was not examined.

2.2. *Earnings Inequality*

Most inequality decompositions based on U.K. data have studied aggregate income inequality, rather than earnings themselves.[2] However, there are

[1] See Meager *et al.* (1994, 1996), Curran *et al.* (1987), Smith (1986), OECD (1992), Rubery *et al.* (1993), Baker (1993), Jenkins (1994), Goodman and Webb (1994), and Parker (1997).

[2] See, for example, Borooah *et al.* (1991), Atkinson (1993), Machin and Waldfogel (1994), and Jenkins (1994, 1995). The most comprehensive study is by Jenkins (1995), who partitioned households by the number of adults, the number of earners, region, age and employment status of the head. Borooah *et al.* were more concerned with regional effects, and Machin and Waldfogel with the effects of female incomes on family income inequality.

exceptions. For example, two recent studies by Bell *et al.* (1994) and Bell (1995) decomposed British earnings inequality, measured by the mean log deviation (MLD), using New Earnings Survey data. Bell *et al.* (1994) reported that demographic structure accounted for 13.5 percent of inequality in 1975, and 23 percent by 1990. Despite this, inequality growth could not be explained by demographic change. These results attribute somewhat greater explanatory power to demographic effects than household income inequality decompositions have done (Borooah *et al.*, 1991; Jenkins, 1995).[3]

Earnings inequality has also been decomposed by industrial sector. Bell (1995) measured inequality within and between 202 manufacturing industries over 1983–90. As with demographics, unexplained within-group variation dominated both inequality and its growth over the period examined. Schmitt (1995) decomposed changes in U.K. education earnings differentials (rather than inequality) with *General Household Survey* (GHS) data. He also found small effects due to changes in industrial structure between 1978 and 1988, with growth in the within-group term accounting for 92 percent of the growth in total differentials.

The declining importance of trades unions may also explain observed increases in earnings inequality. Gosling and Machin (1995) investigated this issue using Workplace Industrial Relations data over 1980–90. A variance decomposition measured the reduction in earnings inequality which would have occurred if the trade union structure of 1980 had still been in place in 1990. The hypothesised inequality reduction was found to be relatively small, of between 11 and 17 percent, although larger effects (20–25 percent) were found for the 1984–90 subperiod.

2.3. *The Variables Used in This Study*

A broad range of variables is used to explain the inequality of employment and self-employment incomes in this paper: age, region, industrial sector, gender, marital status, occupation, full-time/part-time work status, and years of education. A rationale for using age and education variables to explain inequality is provided by the human capital model, at least for employment incomes; and studies of U.K. earnings differentials have concluded that returns to age and education have risen steadily since the 1960s and 1970s (Gosling *et al.*, 1996). Less formal arguments support the inclusion of the other variables. For example, Blackburn (1990) considered the effect of marital status on U.S. inequality, on the grounds that family responsibilities may force married people to substitute away from relatively low-paying jobs with non-pecuniary compensating advantages towards higher paying jobs with fewer of such advantages.[4] However, a more compelling case can be made for including occupation and industrial structure partitions. Both variables are linked to the "de-industrialisation" hypothesis

[3]An exception is Mookherjee and Shorrocks (1982), who reported larger effects than Bell *et al.* over 1965–80. However, the use of grouped rather than micro-level data by these authors artificially reduced some of the unexplained (within-group) inequality.

[4]For U.K. (shift-share) evidence on this issue from the 1950s and 1960s, see Dinwiddy and Reed (1977).

for growing inequality (Bluestone and Harrison, 1988), as well as to the "supply and demand" story of changing wage structure (Murphy and Welch, 1992; Katz and Murphy, 1992).[5]

3. Decomposition Formulae

Three inequality measures will be considered in this study: the mean log deviation MLD, denoted I_0; half the squared coefficient of variation, I_2; and Kolm's (1976) index, $K(\alpha)$. The formulae for these measures are:

$$I_0 = n^{-1} \sum_{i=1}^{n} \ln(\bar{y}/y_i) \tag{1}$$

$$I_2 = (2n)^{-1} \sum_{i=1}^{n} [(y_i/\bar{y})^2 - 1] = \sigma^2/2\bar{y}^2 \tag{2}$$

$$K(\alpha) = \alpha^{-1} \ln \left[n^{-1} \sum_{i=1}^{n} \exp\{\alpha(\bar{y} - y_i)\} \right] \qquad \alpha > 0 \tag{3}$$

where y_i is the income of person i: $i = 1, \ldots n$; n is the sample size; $\bar{y} = n^{-1}\sum_i y_i$ is mean income; and σ^2 is the variance of incomes. Both I_0 and I_2 are members of the "Generalised Entropy" class of inequality measures, and take values confined to the positive half line. They are both "relative invariant" (RI) measures, i.e. they are unaffected by equal proportionate increases in all incomes; and neither is derived explicitly from a social welfare function. Both measures are additively decomposable by population sub-groups.

$K(\alpha)$ differs from I_0 and I_2 by being based on a social welfare function, and by being "absolute invariant" (AI), that is, unaffected by equal additions to all incomes. The social welfare function underlying the measure penalises departures of the income distribution from an "equally distributed equivalent" (e.d.e.) income, denoted ξ. This is the equally distributed income that could preserve welfare at the level currently obtained from the (higher) currently unequally distributed income level.[6] Penalisation is an increasing function of social aversion to inequality, represented by the parameter α.

AI measures are invariant to equal additions of incomes, but not to scalar multiplication. Kolm (1976) argues that this is a desirable property because a common income expansion widens the income gap between rich and poor. While this is reflected by $K(\alpha)$, it is not by RI measures. Since the choice of a "preferred" inequality measure is subjective, both RI and AI measures are reported in the following. However, Kolm's measure also happens to enjoy an important advantage over the other two. Sample data on incomes are often of poor quality, especially for the self-employed, with common occurrences of income mis-

[5]See also Bean and Symons (1989) and Meghir and Whitehouse (1996), for U.K. studies of trends in occupation differentials.

[6]This follows from the fact that $K(\alpha) \equiv \bar{y} - \xi$, $\forall \alpha \in \Re^+$ (see Blackorby *et al.*, 1981). Note also that, like I_0 and I_2, $K(\alpha) \in \Re^+$.

reporting, data coding errors, etc. As Cowell and Victoria-Feser (1996) have demonstrated, this can cause measures that are not robust to data contamination to give misleading indications of inequality levels and trends. Unfortunately, most inequality measures are non-robust, including I_0 and I_2. $K(\alpha)$ is an exception, provided that mean income $\bar{y}$ is not mis-reported. Methods for correcting raw income data to avoid mean income mis-reporting are described in the next section.

The robustness property of the Kolm index extends to each term of its decomposition. We now describe how additively decomposable inequality measures are decomposed. Consider a characteristic which classifies the population exhaustively into J different groups j: $j = 1, \ldots, J$. Write the proportions of the population in each sub-group j as p_j, so $\sum_{j=1}^{J} p_j = 1$; denote sub-group mean incomes by $\bar{y}_j$; denote sub-group equally distributed equivalent incomes by ξ_j; and denote the inequality within a sub-group by Θ_j, where Θ is the given inequality measure. Use a "W" ("B") superscript to denote the within-group (between-group) component: then $\Theta = \Theta^W + \Theta^B$. In the cases of I_0, I_2 and $K(\alpha)$, the within and between group components are:

$$(4) \qquad I_0^W = \sum_{j=1}^{J} p_j I_{0j} \qquad I_0^B = \sum_{j=1}^{J} p_j \ln(\bar{y}/\bar{y}_j)$$

$$(5) \qquad I_2^W = \sum_{j=1}^{J} p_j (\bar{y}_j/\bar{y}) I_{2j} \qquad I_2^B = \sum_{j=1}^{J} p_j [(\bar{y}_j/\bar{y})^2 - 1]$$

$$(6) \qquad K(\alpha)^W = \sum_{j=1}^{J} p_j K(\alpha)_j \qquad K(\alpha)^B = \sum_{j=1}^{J} p_j \xi_j - \xi.$$

If a characteristic is an important determinant of inequality, then between group differences should be substantial, i.e. Θ^B is large relative to Θ. Conversely, if the characteristic is unimportant, most of the inequality subsists within sub-groups (i.e. is unexplained by the partition), so Θ^W is large relative to Θ. Cowell and Jenkins (1995) have defined an "explanatory power" measure $R_B \equiv \Theta^B/\Theta \in [0, 1]$ to capture this idea.

It is harder to find inequality measures which decompose *changes* in inequality, $\Delta\Theta \equiv \Theta_t - \Theta_{t-1}$, into neat additive components. Of the RI measures, only I_0 is amenable to this treatment, at least approximately (Mookherjee and Shorrocks, 1982). Apart from the variance, AI measures have not commonly been investigated in this way. We now show the new result that $K(\alpha)$ is exactly decomposable in first differences:

$$(7) \qquad \Delta K(\alpha) = \underbrace{\sum_{j=1}^{J} p_j^{\Delta t} \Delta K(\alpha)_j}_{\text{[Term A]}} + \underbrace{\sum_{j=1}^{J} \bar{y}_j^{\Delta t} \Delta p_j}_{\text{[Term B]}} + \underbrace{\sum_{j=1}^{J} p_j^{\Delta t} \Delta(\xi_j - \xi)}_{\text{[Term C]}}$$

where $x^{\Delta t} := (x_t + x_{t-1})/2$ for any variable x.

This decomposition gives rise to three terms. Term A is the effect from changing within-group inequalities; term B is the effect from changing sub-group populations; and term C is the effect from changing relative sub-group e.d.e.

incomes.[7] Term A represents "unexplained changes", and terms B and C together measure the change in inequality between sub-groups. Term B is the component of this change caused by changes in population shares; Term C is the component caused by changing income structure within sub-groups which affect e.d.e incomes.[8] Changes in income itself within a group may not affect the group e.d.e. income; but those that do certainly alter welfare, and it is this effect which is being captured by Term C.

4. The Data

Four years of FES micro-data are utilised in this study: 1979, 1985, 1991, and 1994/95. For employees, gross (i.e. pre-tax and deductions) annual earnings were analysed. For the self-employed, gross profits net of expenses and before deducting money drawn for own use were examined. Both income variables were deflated by the retail price index and expressed in 1995 prices for all years. The self-employed data were adjusted for differential timing, and also for under-reporting biases, using the occupation-based correction factors provided by Paul Baker (1993) of the IFS. These adjustments are intended to correct data errors in the mean of the series, thereby permitting the robustness property of Kolm's measure, $K(\alpha)$, to be invoked. Following Blackorby *et al.* (1981), the parameterisation $\alpha = 5 \times 10^{-5}$ is used for all the results; different α values produced qualitatively similar results, suppressed here for brevity.

Table 1 presents summary statistics of the data. Mean incomes increased for both income sources in the boom of the late 1980s, before falling back in the recession of the early 1990s. According to I_2 and $K(5 \times 10^{-5})$, the inequality of employment incomes increased rapidly in the 1980s, peaking in 1991 before falling back somewhat by 1994/95. According to $K(5 \times 10^{-5})$, the same is also true of self-employment income inequality, although the other (non-robust) measures tell conflicting stories. The pronounced disagreement between these measures may be a consequence of the well-known data contamination problems with the self-employment income data, which strengthens the case for considering Kolm's robust measure henceforth.

[7]If all incomes change by the same amount, say Δy, (which is not the case using the data in this study) then a simpler formula than (7) can be used, viz: $\Delta K(\alpha) = \sum_j \bar{y}_j \Delta p_j$ (dropping the Δt superscript notation here and below). To see this, re-express and difference (3) to obtain

$$\Delta K(\alpha) = \sum_{j=1}^{J} (p_j \Delta \bar{y}_j + \bar{y}_j \Delta p_j) + \alpha^{-1} \Delta \ln \lambda,$$

where $\lambda := n^{-1} \sum_i \exp\{-\alpha y_i\}$. If the change in income is Δy, $\forall i$, then

$$\alpha^{-1} \Delta \ln \lambda = \frac{1}{\alpha} \ln \left[\frac{n^{-1} \sum_i \exp\{-\alpha(y_i + \Delta y)\}}{n^{-1} \sum_i \exp\{-\alpha y_i\}} \right] = -\Delta y$$

Therefore

$$\Delta K(\alpha) = \sum_{j=1}^{J} (p_j \Delta \bar{y}_j + \bar{y}_j \Delta p_j) - \Delta y = \sum_{j=1}^{J} \bar{y}_j \Delta p_j.$$

[8]Despite possible appearances to the contrary, Term C is similar to the income change term in the decomposition of ΔI_0, which is expressed in terms of the *ratio* of group mean incomes to overall mean income. In (7) above, Term C is expressed in terms of the *difference* between group *e.d.e.* incomes and overall e.d.e. income.

TABLE 1

SUMMARY STATISTICS OF THE FES SAMPLES, FOR EMPLOYEES AND FOR THE SELF-EMPLOYED

Characteristics	1979	1985	1991	1994/95
	Employees			
Mean gross annual income (1995 prices)	10,062	11,387	17,030	13,375
I_0	0.26	0.31	0.32	0.33
I_2	0.21	0.29	0.36	0.34
$K(5\times10^{-5})$	916	1,435	3,127	2,133
Mean age (years)	37.9	37.6	37.6	37.8
Male (%)	57.2	55.2	51.6	49.1
Full-time (%)	79.1	76.8	76.9	71.6
Married (%)	70.9	69.6	64.8	70.8
South-East (%)	21.4	19.9	21.1	21.0
Left education after 18 (%)	n/a	11.7	15.2	18.3
Professional (%)	23.3	27.3	20.3*	21.4*
Skilled manual (%)	25.0	23.2	12.4*	11.9*
Unskilled manual (%)	29.1	25.4	16.2*	15.7*
	Self-Employed			
Mean gross annual income (1995 prices)	7,088	11,892	20,119	19,293
I_0	1.85	0.65	0.78	1.52
I_2	1.15	0.49	3.05	1.44
$K(5\times10^{-5})$	1,938	2,524	8,487	8,121
Mean age (years)	38.3	40.6	41.6	43.5
Male (%)	44.3	70.1	71.9	75.8
Full-time (%)	n/a	69.8	71.4	77.2
Married (%)	80.6	78.7	75.7	82.5
South-East (%)	21.5	23.4	20.9	23.1
Left education after 18 (%)	n/a	n/a	15.8	20.1

* Indicates that these data are not strictly comparable with those for 1979 and 1985, due to a change in occupational classification.

Various characteristics of employees and the self-employed are also set out in Table 1 (see the Data Appendix for details). The self-employed are seen to be older on average than employees, better educated, and with greater and growing male participation rates (see also Campbell and Daly, 1992, for similar evidence using Labour Force Survey data). An interesting difference between employees and the self-employed is a downward trend in full-time work for the former, but an upward trend for the latter. For both groups, there is a greater tendency for youngsters to remain in education after the age of 18 from the mid-1980s onwards, a finding also reported by Schmitt (1995) using GHS data.

An unusually low male self-employment participation rate is observed in 1979. This was caused by dramatic over-sampling of hoteliers and guest-house keepers, in which females are disproportionately concentrated. This over-sampling is out of line both with FES data from other years and data from other surveys (Campbell and Daly, 1992). Due to this problem, only data from 1985 onwards will be used to analyse self-employment income inequality across time.

5. RESULTS

The explanatory power of the inequality decompositions, R_B, is documented in Table 2 for each of the three inequality measures, a range of characteristics,

and each of the labour market groups. The robustness of the Kolm measure (abbreviated to K in the table) recommends it as the basis for interpretation of the results in the following.[9]

TABLE 2

EXPLANATORY POWER OF SUB-GROUP PARTITIONS (%) FOR EMPLOYEES AND THE SELF-EMPLOYED

	1979			1985			1991			1994/95		
Partitions	I_0	I_2	K	I_0	I_2	K	I_0	I_2	K	I_0	I_2	K
					Employees							
Age	9.6	8.3	7.5	11.1	7.4	7.7	10.6	6.1	3.8	13.3	6.0	7.9
Gender	27.3	29.6	29.0	23.7	22.1	22.7	19.5	20.2	16.9	17.2	14.9	15.7
Married	2.8	3.1	2.5	3.2	3.0	3.3	2.1	1.8	0.6	2.6	2.3	3.2
Region	1.0	1.0	0.5	1.8	1.8	2.2	2.5	2.4	1.2	2.4	6.0	1.9
Occupation*	23.1	26.9	24.2	27.1	26.4	26.3	33.6	31.0	30.0	34.6	35.5	32.1
Full-time	40.3	28.9	30.4	37.6	23.4	27.2	38.1	16.7	25.2	37.7	6.4	27.0
Education	n/a	n/a	n/a	4.8	7.5	5.4	6.3	7.2	6.1	7.9	9.4	8.6
					Self-Employed							
Age	4.7	5.1	5.0	7.0	4.3	5.3	8.9	0.1	1.4	2.8	14.9	1.0
Gender	28.8	32.7	32.3	18.2	17.1	14.8	11.9	2.3	5.4	2.0	2.0	2.0
Married	0.1	0.1	0.3	1.0	0.8	0.1	1.9	0.3	0.7	0.6	4.1	0.4
Region	2.5	1.3	2.1	3.0	1.0	1.5	9.8	1.2	2.0	3.0	25.9	1.0
Occupation*	25.2	25.4	25.7	7.7	8.4	5.3	36.4	8.3	6.3	16.8	43.7	13.3
Full-time	n/a	n/a	n/a	24.6	20.0	18.1	18.4	3.1	7.9	3.7	6.4	2.5
Education	n/a	n/a	n/a	n/a	n/a	n/a	4.6	1.1	0.4	3.6	6.4	2.0

Note: "Explanatory power" defined in the text.

* Results from 1991 and 1994/95 are not comparable with those from 1979 and 1985, because of a change in occupational classification.

For employees, Table 2 shows that occupation and work status have the greatest explanatory power, each accounting for between one-quarter and one-third of inequality in each year. These are sizeable influences compared with what has been found in previous decomposition analyses. This either implies that these variables were unjustifiably neglected by previous researchers, or implies that disaggregating income into its earnings component makes decompositions more accurate. Gender is the next most important influence, although its explanatory power halved in importance between 1979 and 1994/95. Age and education are relatively unimportant influences, accounting for only 5–10 percent of earnings inequality over the period. Region and marital status have virtually no explanatory power in any year.

For the self-employed, and ignoring 1979 as explained in the previous section, the results are less impressive. As for employees, region and marital status have very little explanatory power, and age and education are also minor influences. The role of gender is smaller for the self-employed than for employees, in every year from 1985 onwards. Whilst it has declined for both groups, it has

[9]One symptom of the lack of robustness of the I_0 and I_2 measures is their proneness to take extreme R_B values (see, e.g. the 1991 I_0 value and 1994/95 I_2 value for occupation of the self-employed).

declined so dramatically for the self-employed that in 1994/95 it explains practically nothing of self-employed income inequality. This result dispels the conjecture, advanced in Meager *et al.* (1994), amongst others, that greater self-employment income inequality at the end of the 1980s is attributable to greater numbers of female self-employed. The part-time/full-time distinction has also declined in importance, from 18 percent in 1985 to just 2.5 percent by 1994/95, a decrease in explanatory power which has been accompanied by a decrease in the proportion of part-time self-employed over time. In contrast, the occupation partition has increased in importance from just over 5 percent in 1985 to just over 13 percent in 1994/95.

An industrial classification variable was also available for 1979 and 1985. For employees, the R_B percentage values corresponding to I_0, I_2 and K in 1985 (1979) were, respectively: 16.9 (13.6), 15.0 (14.6), 16.9 (16.2). For the self-employed, the values were: 24.6 (17.5), 25.0 (25.7), 24.4 (24.9). These are fairly large influences, so it is unfortunate that this variable was dropped from the FES in more recent years. It also indicates that this variable might deserve greater consideration in future work on U.K. income inequality, data permitting.

TABLE 3

DECOMPOSITION OF CHANGES IN KOLM'S INEQUALITY MEASURE FOR EMPLOYEES (E) AND THE SELF-EMPLOYED (S)

		1979–85§	1985–91		1979–94/95	1985–94/95§
Partition & Terms		E	E	S	E	S
Age	A (%)	85.4	94.2	98.4	82.1	93.8
	B (%)	35.0	12.5	3.9	48.2	15.6
	C (%)	−20.4	−6.7	−2.3	−30.3	−9.4
Gender	A (%)	91.2	91.5	97.0	100.0	100.5
	B (%)	−28.9	−21.1	4.2	−53.3	10.5
	C (%)	37.6	29.6	−1.2	53.3	−11.0
Married	A (%)	97.3	100.2	100.1	96.4	97.4
	B (%)	−7.3	4.3	−2.5	−0.3	3.1
	C (%)	10.0	−4.5	2.4	3.9	−0.5
Region	A (%)	98.6	99.1	96.4	94.4	95.0
	B (%)	−0.9	1.4	3.1	6.5	5.8
	C (%)	2.3	−0.6	0.5	−0.9	−0.8
Occupation*	A (%)	59.9	–	–	–	–
	B (%)	65.9	–	–	–	–
	C (%)	−25.8	–	–	–	–
Work Status	A (%)	80.7	76.8	94.9	80.3	96.1
	B (%)	−40.7	0.9	4.2	−46.1	18.1
	C (%)	60.0	22.3	0.9	65.8	−14.2
Education	A (%)	–	89.5	–	–	–
	B (%)	–	18.0	–	–	–
	C (%)	–	−7.5	–	–	–

§ Results relating to self-employment incomes in 1979 are not reported because of the unreliability of these data.

* 1991 and 1994/95 data are not comparable with those for 1979 and 1985, because of a change in occupational classification.

– Indicates data are either unavailable or not comparable.

Table 3 presents results of the decomposition (7), expressing Terms A, B and C as percentages of ΔK. For employees, the majority of inequality growth, for all

temporal comparisons and all explanatory variables except occupation, is attributable to unexplained within-group effects (Term A). Between group effects (the sum of Terms B and C) invariably net out to relatively small influences, especially for gender, marital status and region. The occupation partition stands out for having a dominant demographic effect (Term B), implying that changes in employment mix played the greatest role in explaining earnings inequality growth between 1979 and 1985. Some fairly sizeable between-group effects are also noticeable for some partitions, although the size and direction of Terms B and C fluctuate erratically from year to year and are difficult to interpret in these cases.

For the self-employed, within-group effects are dominant for all available partitions. The largest demographic effects are observed for age and work status over 1985–94/5, though these are both offset by changes in e.d.e. incomes. Unfortunately, data are not available to make comparisons over 1991–94/5 for the occupation variable, which was seen in Table 2 to have increased in explanatory power over this period.

6. Conclusion

This study analysed the causes of U.K. inequality over 1979–94/95, separately for employees and the self-employed. According to FES data, the inequality of both income sources grew rapidly in the 1980s, peaking in 1991 before falling back slightly by 1994/95. A relatively large number of variables were used to decompose inequality between 1979 and 1994/95, including age, gender, marital status, region, occupation, work status, and education.

Compared with previous studies, employees' income inequality was explained relatively successfully in terms of changing occupational structure and full-time/part-time work status. This success may suggest the advisability of analysing the inequality of income components rather than a broadly defined measure of overall income. The most striking result was that changes in employment between occupations played the greatest role in explaining earnings inequality growth between 1979 and 1985. We suggest that future research should examine the inequality–occupation link more closely.

Occupation also appeared to be the most powerful explanatory variable for self-employment income inequality. However, efforts to explain the level and growth of income inequality for this group met with less success than for employees. In short, if increased self-employment income inequality in the 1980s was caused by greater heterogeneity of the self-employed, our results do not identify the manifestations of this heterogeneity. Clearly further searches for important explanatory variables, especially with regard to the self-employed, are needed.

Data Appendix

Definition of the partitions:

Age. Following Bell *et al.* (1994), nine five-year bands from 17 to 21 up to 57 to 61 were supplemented with the two open-ended ranges "less than 17" and "greater than 61."

Gender, Married. These were simple two-group categories; cohabitees were treated as "married" rather than "single".

Region. As in Jenkins (1995), twelve standard regions are used in the FES, comprising Northern; Yorkshire/Humberside; North-West; East Midlands; West Midlands; East Anglia; Greater London; South-East; South-West; Wales; Scotland; and Northern Ireland.

Occupation. For 1979 and 1985, the FES used the following nine-category classification: Professional and technical; Administrative and managerial; Teachers; Clerical workers; Shop assistants; Skilled manual; Semi-Skilled manual; Unskilled manual; and Members of HM Forces. The classification for 1991 and 1994/95 has 19 categories; unfortunately it was not possible to relate the two categories together in a precise manner, since some occupations (e.g. "Teachers") have no obvious corresponding category in the other classification.

Hours of work. Individuals working 31 hours or more per week were classified as "full-time" workers; those working 30 hours or less were classified as "part-time" workers.

Education. Following Gosling *et al.* (1996), individuals were distinguished by whether they left school at 18 or older.

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