

Department for Business Innovation & Skills

FURTHER EDUCATION LEARNERS: AVERAGE EARNINGS

Initial outputs of emerging results from earnings analysis of matched data

JANUARY 2014

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Introduction

Background

- 1. This report presents emerging results from analysis of average earnings for Further Education learners, and guidance on the limitations on their use. The estimates should be used with care as they do not control for a number of issues which prevent them from being used to directly compare between different groups of learners. These issues are explained in the section on limitations, which can be found in the main body of the report, and should be read before examining any of the estimates.
- 2. The intention is to explore how the initial results here can be developed further to support a range of possible uses, including assessing institutional performance, but particularly as an additional tool for learners to support careers choice.
- 3. The estimates in this report use data matched across the Individualised Learner Record (ILR), the Department for Work and Pensions (DWP) and Her Majesty's Revenue and Customs (HMRC). This matched data has been used previously to support research on the valued added from Further Education qualifications, linked below. Further background on the matched data is also available through the joint BIS-DWP publication on benefit learners.
 - Estimating the labour market returns from qualifications gained in English further education using the Individualised Learner Record (ILR) Franz Buscha and Peter Urwin (2013).
 - <u>A Disaggregated analysis of the long run impact of vocational qualifications</u> London Economics (2013)
 - Further education for benefit claimants: December 2013
- 4. The matched data is an evolving source and we are working closely with academia to enhance and improve our understanding, which will help overcome some of the limitations that constrain the use of the results in this report.

Contact details

5. If you require more information on the data presented in this report or how it should be used please contact:

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Glossary

Measurement units

Financial year: Runs from 6th April to 5th April the following year. The reference period covered by the 2010-11 financial year runs from 6th April 2010 to 5th April 2011.

Sustained employment: An individual is counted as being in sustained employment if they are recorded as having a continuous spell of employment lasting 6 months within the 2010/11 financial year.

Annualised average earnings: The calculated average daily wage across the 2010/11 financial year grossed up to the equivalent annual figure.

Learning

Academic year: Runs from 1st August to 31st July. The learning period covered in this publication runs from 1st August 2009 to 31st July 2010.

Apprenticeships: Paid jobs that incorporate on and off the job training leading to nationally recognised qualifications. As an employee, Apprentices earn as they learn and gain practical skills in the workplace. For further information, please see: <u>http://www.apprenticeships.org.uk</u>

Skills: Covers Further Education provision classified as Learner Responsive, University for Industry, and Workplace Learning (excluding Apprenticeships). Volumes include funded learners only, and include Offender Learning and Skills Service (OLASS) provision.

Full Level 2: Equivalent to an NVQ at Level 2.

Full Level 3: Equivalent to an NVQ at Level 3.

Achiever: A learner that has achieved their qualification. Achievers are counted in the year that they actually achieved, regardless of when the qualification started or was due to be started.

Sector Subject Area: Sector Subject Areas are classifications of business areas as determined by the Qualification and Curriculum Authority (QCA). This publication uses the Tier 1 classifications which is a broad grouping of values, for example 'Health, Public Services and Care'.

Local Enterprise Partnership (LEP): LEPs are partnerships between local authorities and businesses. They decide what the priorities should be for investment in roads, buildings and facilities in the area. For further information, please see: <u>https://www.gov.uk/government/policies/supporting-economic-growth-through-localenterprise-partnerships-and-enterprise-zones</u>

Results

Initial findings

- 6. The data is presented in full in the next section, for learners that achieved Full Level 2 or Full Level 3 qualifications in the 2009/10 academic years. The tables are aggregated by type of provision, level of qualification, Sector Subject Area and Local Enterprise Partnership (LEP) Area.
- 7. Earnings are measured across the 2010-11 financial year where an achiever has been in sustained employment – a continuous spell of employment of at least 6 months. For most learners this will be the first full tax year post learning, but for some learners finishing later in the 2009/10 academic year there will be a small overlap of learning and employment. The restriction to only consider earnings for those in sustained employment mitigates against this overlap and ensures a robust figure.
- 8. The earnings estimates have been calculated from annual data recorded through the HMRC Pay As You Earn (PAYE) system, which includes anyone who pays income tax through their employer (further details can be found in the Annex). The annual earnings data is combined with information on employment spells to calculate a daily wage, which is then grossed up to an annual figure. This approach standardises earnings to account for partial spells of employment, but does not adjust for part time employment, which is not identifiable in the data (discussed below).
- 9. Earnings are a highly complex area to understand, as there are a wide number of factors that will contribute to an individual's income beyond study, not least their personal employment history and the economic conditions at the time they leave learning. This makes the earnings data difficult to interpret, and makes comparisons across group challenging until the nuances of the data are fully understood. However from a quality assurance standpoint there are a number of interesting and encouraging features that exist within the data.
- 10. By Sector Subject Area (Tables 1 and 2)
 - Learners achieving Advanced Apprenticeships generally have higher average earnings than learner achieving an Intermediate Apprenticeship in the same Sector Subject Area.
 - Learners achieving qualifications in 'Construction, Planning and the Built Environment' and 'Engineering and Manufacturing Technologies' record relatively high average earnings compared to other Sector Subject Areas.
 - Learners achieving qualifications in 'Business, Administration and Law' record high rates of sustained employment across all levels and types of provision.
 - Learners achieving an Apprenticeship have higher rates of sustained employment rates than all other provision in the same Sector Subject Area.

- 11. By LEP (Tables 3 and 4)
 - Learners achieving Advanced Apprenticeships have higher average earnings than learner achieving an Intermediate Apprenticeship in the same LEP.
 - Across other skills provision there is a relatively small spread in average earnings across LEPs.

Limitations of the estimates

12. The estimates show the observed outcomes of achievers, but these are complex numbers with many hidden dynamics. The limitations of the estimates can be best expressed by considering some specific examples.

Into learning

- 13. Full Level 3 skills achievers in 'Social Sciences', 'Science and Mathematics' and 'History, Philosophy and Theology' all record average earnings around £8,000, and a sustained employment rate of less than 50%. The vast majority of achievers in these subject areas were studying for an Access to HE qualification, suggesting that a significant proportion of these learners went on to study for a HE qualification. It is likely that many of those in employment are working part time alongside their study, dragging down the average earnings.
- 14. The matched data does not currently control for learners moving into further learning. In the future the planned development of other destination measures will allow us to identify and remove achievers continuing into learning, either to Further or Higher Education, and so improve the quality of the estimates.

Part time employment

- 15. Nearly all of the Full Level 2 skills achievers in 'Education and Training' studied qualifications for classroom teaching assistants. There was a drive at the time to ensure assistants in schools were qualified, which could account for some of the volumes. Many teaching assistants will be employed part time, meaning they will have lower annualised average earnings, which could explain why the earnings for this group are £8,500.
- 16. We are unable to distinguish between part time and full time employment spells through the HMRC data. Therefore it is important to understand the type of employment that achievers are likely to be involved in, which will vary depending on the qualification they have achieved.

Income below the tax threshold and self assessment

17. The matched data does not include earnings or employment information for all employees that earn below the tax threshold, £6,475 in 2010-11, nor does it record information for those paying tax through self assessment (see the Annex for further details). This means that Sector Subject Areas or LEPs where achievers are likely to have a higher propensity to become self-employed, or be lower earners, will

therefore show lower sustained employment rates, as these people will not be picked up in the data.

18. This may be the case for learners achieving Apprenticeships in 'Construction, Planning and the Built Environment', where the sustained employment rate is 70% for both Intermediate and Advanced Apprenticeships. It is a reasonable supposition that achievers from this Sector Subject Area might be more likely to be selfemployed; however there is nothing in the data to tell us this directly but it is a further effect that must be taken into account when inspecting the estimates.

Employment sector

19. The data show that 88% of learners achieving an Advanced Apprenticeship in 'Business, Administration and Law' were in sustained employment across the 2010-11 financial year. This does not tell us if that employment was with the same employer where they achieved their apprenticeship, nor does it tell us if the employment spell was even related to the skills picked up on their apprenticeship. The average earnings and sustained employment rates are indicative of learners achieving qualifications in certain Sector Subject Areas, but are not necessarily representative of similar employment sectors.

Demographics

20. The demographic make up of achievers will have a large impact on the overall estimates; in particular as earnings vary by age and gender. The estimates are a measure of what has happened for a specific group of people, rather than what a 'typical' individual might expect to happen should they achieve that qualification.

Future developments

- 21. This report shares the initial findings from a wider project of work to develop matched data sources to observe learner outcomes following Further Education study. We will continue to build on the work presented in this paper to understand how far it is possible to go with these estimates, and how the distinct characteristics of both Further Education learners and the data sources impact how the estimates should be interpreted and used.
- 22. The matched data is being used to develop other new measures which look at learner outcomes, with a view to publishing experimental data later in 2014. These will focus on the destinations and progression of FE learners who completed courses in the 2010/11 and 2011/12 academic years. The destinations measure will include an estimate of learners that continue into learning, to both Further Education and Higher Education courses. The ability to identify these learners will improve the earnings data, mitigating for the effects mentioned above in paragraph 14 in any future estimates.
- 23. A second phase of work will now commence to establish how far it is possible to go with the earnings data and consider the appropriateness for different purposes, including as a tool for careers advice. The data published in this initial report will be reviewed based on this research, and after the development of additional measures mentioned above and any other improvements to the underlying data sources.

Tables

Table 1: Annualised Average Earnings and Sustained Employment rate for Full Level 2 and Full Level 3 Apprenticeships 19+ Achievers in 2009/10 by Sector Subject Area

Level	Sector Subject Area	Annualised Average Earnings	Sustained Employment Rate
Full Level 2	Agriculture, Horticulture and Animal Care	£14,300	79%
	Arts, Media and Publishing	*	*
	Business, Administration and Law	£16,100	86%
	Construction, Planning and the Built Environment	£16,000	70%
	Education and Training	*	*
	Engineering and Manufacturing Technologies	£18,300	84%
	Health, Public Services and Care	£13,600	84%
	History, Philosophy and Theology	*	*
	Information and Communication Technology	£20,500	86%
	Languages, Literature and Culture	*	*
	Leisure, Travel and Tourism	£14,200	80%
	Preparation for Life and Work	*	*
	Retail and Commercial Enterprise	£12,900	82%
	Science and Mathematics	*	*
	Social Sciences	*	*
Full Level 3	Agriculture, Horticulture and Animal Care	£16,200	76%
	Arts, Media and Publishing	*	*
	Business, Administration and Law	£18,100	88%
	Construction, Planning and the Built Environment	£18,800	70%
	Education and Training	*	*
	Engineering and Manufacturing Technologies	£22,800	83%
	Health, Public Services and Care	£13,100	85%
	History, Philosophy and Theology	*	*
	Information and Communication Technology	£21,300	84%
	Languages, Literature and Culture	*	*
	Leisure, Travel and Tourism	£15,100	84%
	Preparation for Life and Work	*	*
	Retail and Commercial Enterprise	£14,400	79%
	Science and Mathematics	*	*
	Social Sciences	*	*

Source: ILR-WPLS Matched Data.

2. Sector Subject Areas with less than 500 matched learners are marked with an asterisk *.

3. Learners completing a Full Level 2 or Full Level 3 in an unknown Sector Subject Area are not included within the table.

4. Learners with multiple achievements are included in the table only once, based on their learning aim at the highest level.

^{1.} See Glossary for definitions of measurement units.

Table 2: Annualised Average Earnings and Sustained Employment Rate for Full Level 2 and Full Level 3 Skills Courses 19+ Achievers in 2009/10 by Sector Subject Area

Level	Sector Subject Area	Annualised Average Earnings	Sustained Employment Rate
Full Level 2	Agriculture, Horticulture and Animal Care	£18,600	77%
	Arts, Media and Publishing	£13,000	44%
	Business, Administration and Law	£19,300	85%
	Construction, Planning and the Built Environment	£22,300	63%
	Education and Training	£8,500	76%
	Engineering and Manufacturing Technologies	£19,500	65%
	Health, Public Services and Care	£13,900	81%
	History, Philosophy and Theology	*	*
	Information and Communication Technology	£17,600	69%
	Languages, Literature and Culture	£18,900	72%
	Leisure, Travel and Tourism	£13,800	72%
	Preparation for Life and Work	£13,200	47%
	Retail and Commercial Enterprise	£15,400	81%
	Science and Mathematics	*	*
	Social Sciences	*	*
Full Level 3	Agriculture, Horticulture and Animal Care	£13,900	62%
	Arts, Media and Publishing	£7,600	45%
	Business, Administration and Law	£20,100	82%
	Construction, Planning and the Built Environment	£26,300	68%
	Education and Training	£15,800	79%
	Engineering and Manufacturing Technologies	£24,800	76%
	Health, Public Services and Care	£14,500	78%
	History, Philosophy and Theology	£8,400	48%
	Information and Communication Technology	£14,900	56%
	Languages, Literature and Culture	*	*
	Leisure, Travel and Tourism	£12,900	69%
	Preparation for Life and Work	*	*
	Retail and Commercial Enterprise	£17,600	71%
	Science and Mathematics	£8,000	49%
	Social Sciences	£8,200	49%

Source: ILR-WPLS Matched Data.

3. 4. Learners completing a Full Level 2 or Full Level 3 in an unknown Sector Subject Area are not included within the table.

Learners with multiple achievements are included in the table only once, based on their learning aim at the highest level.

See Glossary for definitions of measurement units. 1.

^{2.} Sector Subject Areas with less than 500 matched learners are marked with an asterisk *.

Table 3: Annualised Average Earnings and Sustained Employment rate for Full				11
Level 2 and Full Level 3 Apprenticeships 19+ Achievers in 2009/10 by Local				
Enterprise Partnership Area				
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Level	Local Enterprise Partnership Area	Annualised Average Earnings	Sustained Employment Rate
Full Level 2	Black Country	£14,200	80%
	Buckinghamshire Thames Valley	£16,300	82%
	Cheshire and Warrington	£14,900	83%
	Coast to Capital	£15,800	82%
	Cornwall and the Isles of Scilly	£16,100	84%
	Coventry and Warwickshire	£14,700	84%
	Cumbria	£14,100	82%
	Derby, Derbyshire, Nottingham and Nottinghamshire	£14,100	82%
	Dorset	£17,500	86%
	Enterprise M3	£19,100	87%
	Gloucestershire	£14,400	83%
	Greater Birmingham and Solihull	£13,900	81%
	Greater Cambridge & Greater Peterborough	£15,800	86%
	Greater Lincolnshire	£13,600	84%
	Greater Manchester	£14,200	81%
	Heart of the South West	£14,300	84%
	Hertfordshire	£15,300	81%
	Humber	£17,300	86%
	Lancashire	£13,700	84%
	Leeds City Region	£14,000	80%
	Leicester and Leicestershire	£14,200	86%
	Liverpool City Region	£14,300	79%
	London	£16,800	79%
	New Anglia	£15,100	86%
	North Eastern	£14,600	83%
	Northamptonshire	£14,800	84%
	Oxfordshire LEP	£16,400	87%
	Sheffield City Region	£14,100	80%
	Solent	£17,900	87%
	South East	£15,100	83%
	South East Midlands	£15,100	83%
	Stoke-on-Trent and Staffordshire	£14,900	83%
	Swindon and Wiltshire	£19,000	88%
	Tees Valley	£13,300	83%
	Thames Valley Berkshire	£18,500	87%
	The Marches	£13,800	83%
	West of England	£14,900	83%
	Worcestershire	£13,900	83%
	York and North Yorkshire	£17,500	85%

Full Level 3	Black Country	£16,600	82%
	Buckinghamshire Thames Valley	*	*
	Cheshire and Warrington	£17,800	82%
	Coast to Capital	£18,700	81%
	Cornwall and the Isles of Scilly	£17,100	83%
	Coventry and Warwickshire	£17,100	84%
	Cumbria	£19,900	82%
	Derby, Derbyshire, Nottingham and Nottinghamshire	£17,000	83%
	Dorset	£21,400	85%
	Enterprise M3	£19,800	86%
	Gloucestershire	£17,200	83%
	Greater Birmingham and Solihull	£17,000	82%
	Greater Cambridge & Greater Peterborough	£18,300	85%
	Greater Lincolnshire	£17,200	86%
	Greater Manchester	£16,800	81%
	Heart of the South West	£16,500	82%
	Hertfordshire	£18,900	79%
	Humber	£20,500	84%
	Lancashire	£17,500	85%
	Leeds City Region	£16,900	84%
	Leicester and Leicestershire	£17,400	83%
	Liverpool City Region	£16,500	80%
	London	£19,900	79%
	New Anglia	£17,900	84%
	North Eastern	£17,000	83%
	Northamptonshire	£17,100	83%
	Oxfordshire LEP	*	*
	Sheffield City Region	£16,900	83%
	Solent	£18,400	85%
	South East	£18,900	83%
	South East Midlands	£18,100	83%
	Stoke-on-Trent and Staffordshire	£17,500	82%
	Swindon and Wiltshire	£17,900	84%
	Tees Valley	£17,100	82%
	Thames Valley Berkshire	£24,800	89%
	The Marches	£19,400	87%
	West of England	£17,800	81%
	Worcestershire	£16,500	84%
	York and North Yorkshire	£19,600	84%

Source: ILR-WPLS Matched Data.

1. See Glossary for definitions of measurement units.

2. LEPs with less than 500 matched learners are marked with an asterisk *.

3. LEP boundaries are defined as at time of publication and based on the Local Authority of the learner through their home postcode.

4. Learners completing a Full Level 2 or Full Level 3 with an unknown home postcode are not included within the table.

Learners with multiple achievements are included in the table only once, based on their learning aim at the highest level.
Learners may appear more than once in the table, if their Local Authority is within multiple LEPs.

Table 4: Annualised Average Earnings and Sustained Employment Rate for Full Level 2 and Full Level 3 Skills Courses 19+ Achievers in 2009/10 by Local Enterprise Partnership Area

Level	Local Enterprise Partnership Area	Annualised Average Earnings	Sustained Employment Rate
Full Level 2	Black Country	£16,500	75%
	Buckinghamshire Thames Valley	£18,000	73%
	Cheshire and Warrington	£17,000	78%
	Coast to Capital	£17,400	72%
	Cornwall and the Isles of Scilly	£15,500	76%
	Coventry and Warwickshire	£17,500	80%
	Cumbria	£17,400	81%
	Derby, Derbyshire, Nottingham and Nottinghamshire	£17,100	78%
	Dorset	£16,700	78%
	Enterprise M3	£18,800	77%
	Gloucestershire	£17,500	80%
	Greater Birmingham and Solihull	£16,700	72%
	Greater Cambridge & Greater Peterborough	£17,600	78%
	Greater Lincolnshire	£16,700	79%
	Greater Manchester	£16,000	74%
	Heart of the South West	£16,000	77%
	Hertfordshire	£18,400	75%
	Humber	£16,600	78%
	Lancashire	£16,400	79%
	Leeds City Region	£16,800	76%
	Leicester and Leicestershire	£16,800	78%
	Liverpool City Region	£16,400	71%
	London	£18,500	67%
	New Anglia	£16,600	79%
	North Eastern	£17,700	79%
	Northamptonshire	£18,300	80%
	Oxfordshire LEP	£18,700	79%
	Sheffield City Region	£16,900	78%
	Solent	£16,900	74%
	South East	£17,500	77%
	South East Midlands	£18,200	76%
	Stoke-on-Trent and Staffordshire	£17,900	79%
	Swindon and Wiltshire	£18,200	80%
	Tees Valley	£16,600	77%
	Thames Valley Berkshire	£18,300	78%
	The Marches	£17,300	80%
	West of England	£17,300	75%
	Worcestershire	£16,500	79%
	York and North Yorkshire	£17,400	81%

Bu Cr Cc Cc Cc Cc Cc Cu De	ack Country uckinghamshire Thames Valley heshire and Warrington oast to Capital ornwall and the Isles of Scilly oventry and Warwickshire umbria erby, Derbyshire, Nottingham and Nottinghamshire orset	£16,000 £17,700 £15,800 £16,100 £14,900 £15,900 £15,900 £18,400 £16,600	75% 80% 76% 71% 73% 75% 80%
Cr Cc Cc Cc Cc Cc	heshire and Warrington oast to Capital ornwall and the Isles of Scilly oventry and Warwickshire umbria erby, Derbyshire, Nottingham and Nottinghamshire orset	£15,800 £16,100 £14,900 £15,900 £18,400 £16,600	76% 71% 73% 75%
Cc Cc Cc Cc Cc	oast to Capital ornwall and the Isles of Scilly oventry and Warwickshire umbria erby, Derbyshire, Nottingham and Nottinghamshire orset	£16,100 £14,900 £15,900 £18,400 £16,600	71% 73% 75%
Cc Cc Cu De	ornwall and the Isles of Scilly oventry and Warwickshire umbria erby, Derbyshire, Nottingham and Nottinghamshire orset	£14,900 £15,900 £18,400 £16,600	73% 75%
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Cu De	umbria erby, Derbyshire, Nottingham and Nottinghamshire orset	£18,400 £16,600	
De	erby, Derbyshire, Nottingham and Nottinghamshire orset	£16,600	80%
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		£16,000	75%
	nterprise M3	£16,900	76%
GI	loucestershire	£16,200	78%
Gr	reater Birmingham and Solihull	£15,800	72%
Gr	reater Cambridge & Greater Peterborough	£17,600	77%
Gr	reater Lincolnshire	£17,100	79%
Gr	reater Manchester	£16,400	73%
He	eart of the South West	£15,700	75%
He	ertfordshire	£16,600	73%
Hu	umber	£18,100	76%
La	ancashire	£15,900	77%
Le	eeds City Region	£16,400	73%
Le	eicester and Leicestershire	£16,200	73%
Liv	verpool City Region	£16,400	73%
Lo	ondon	£16,600	63%
Ne	ew Anglia	£16,500	77%
No	orth Eastern	£17,800	74%
No	orthamptonshire	£17,000	77%
0)	xfordshire LEP	£16,700	76%
Sh	heffield City Region	£16,400	74%
Sc	olent	£16,100	76%
Sc	outh East	£17,300	74%
Sc	outh East Midlands	£17,300	76%
St	toke-on-Trent and Staffordshire	£16,700	77%
	windon and Wiltshire	£16,600	76%
	ees Valley	£17,100	74%
	names Valley Berkshire	£16,600	75%
	ne Marches	£16,300	80%
	/est of England	£16,900	76%
	/orcestershire	£15,900	77%
	ork and North Yorkshire	£16,900	76%

Source: ILR-WPLS Matched Data.

2. LEPs with less than 500 matched learners are marked with an asterisk *.

LEP boundaries are defined as at time of publication and based on the Local Authority of the learner through their home postcode. Learners completing a Full Level 2 or Full Level 3 with an unknown home postcode are not included within the table. 3.

- 4.
- Learners with multiple achievements are included in the table only once, based on their learning aim at the highest level. 5.
- 6. Learners may appear more than once in the table, if their Local Authority is within multiple LEPs.

See Glossary for definitions of measurement units. 1.

Annex – Matching process, Data Coverage and Quality

Matching Process

The estimates in this report have been produced using a matched dataset of person level administrative data sources from BIS, DWP and HMRC. The Individualised Learner Record (ILR) is matched to DWP benefit records, and HMRC P45 and P14 income tax returns using a mixture of National Insurance Number and fuzzy matching on personal details. The matching algorithm relies on a number of fields being accurately populated across both datasets which is not the case for every record, so the match rate will never reach 100%.

Once the match is established, the next step is to merge the different data files (employment, benefits, and learners) on the basis of the person level record linkage defined by the matching. The DWP and HMRC datasets provide a record of those receiving benefits and those paying tax through the Pay As You Earn (PAYE) system respectively. Processing rules are then applied to transform the data into useable information on employment and benefit receipt to support all analysis. The coverage of the different datasets is set out below.

Benefit Data

Benefit data are taken from the underlying payments systems and are supplemented by the information entered by Jobcentre advisers. The data therefore captures basic information accurately, but non-compulsory fields in either the labour market system or the payment system may be incomplete. Due to the size and technical complexity, these systems are not accessed directly, but at regular intervals scans are taken that build up a longitudinal picture from repeated snapshots of the data.

Start dates are entered on to the system and are accurate dates of benefit payment, thus provide certain timing and duration of benefit claim. However, while Job Seekers Allowance (JSA) dates have very few discrepancies, due to the way the data is scanned the end dates recorded for other benefits may diverge to some extent from the events they are recording. The potential discrepancy varies from up to two weeks for Employment Support Allowance (ESA) to up to six weeks for Incapacity Benefit (IB).

Employment Data

The employment and earnings administrative data largely covers those who pay tax through PAYE through employer submission of P45 and P14. The core purpose of this process is to collect tax from those who are eligible to pay it through this mechanism, as such there is not complete coverage due to the taxation system. Employers are not required to supply information to HMRC for individuals who earn below the tax threshold, although for large employers these individuals are thought to be included due to methods of data transfer.

In addition any earnings recorded through self assessment will not be in the data. The lack of self assessment data means that the self-employed will not be in the data and the

earnings of the highest paid are likely to be underestimated as they are most likely to have additional earnings recorded through self assessment.

For the purposes of collecting taxes accurate start dates are not required, just the fiscal year and earnings. Therefore a number of returns are found to have missing start dates due to the employer not forwarding a timely P45. The default dates recorded in the dataset are either 6 April (the first day of the tax year), or where only an end date is known as the day before that end date. Similarly for records where the employment is known to have come to an end within a tax year but the end date is not known the record is given a default 5 April end date, the last day of the tax year.

In addition there are several instances of duplicate start dates where more than one employment spell starts on the same day, or conversely duplicate end dates where more than one employment spell ends on the same day. These may arise from administrative processes occurring within HMRC, e.g. in relation to tax credits.

Business rules have been applied to improve the quality of the suspect employment records mentioned above, to make the data more suitable for measuring employment spells. This makes use of algorithms developed by researchers, and uses the same process as documented in the research by Buscha and Urwin (2013).

Learner data

The Skills Funding Agency requirements for personal data vary by the type of provision provided. For work based learning National Insurance Number is recorded for more than 90% of learners compared to around 20% for Education and Training.

Other personal details fields have high completion rates although there is some use of defaults where information is not known and particular groups such as offender learners have information withheld.

The dates of learning can be assumed accurate to within a week. Key data fields are tied to funding therefore there is a strong incentive for providers to ensure the information returned is accurate.

As the data sharing only covers Skills Funding Agency funded learning it does not include learning undertaken outside of England and it also excludes learning funded through the Higher Education route.

Time lags

All data used in this process is drawn from administrative sources, which take time to process and collate. There are therefore lags between the reference period and availability of the dataset for analysis.

Benefit data taken from the National Benefits Database has lags in completeness. Additional clerical claims, appeals and other complex situations add to the changes in later versions of the database. This retrospection in the data means initial records appear after three months while the timescale for complete data is approximately six months. **Employment data** is matched to DWP data on a regular basis. There are cleaning rules applied to this data, which identify old records when updated with new information. As new information can come through about a job after it has ended this is a source of constant change, although the data is considered complete after six months.

Earnings data is less timely than employment data, and it can take up to fifteen months after the end of the tax year for the data to be considered complete. HMRC started to implement Real Time Information (RTI) in April 2013 which will provide much more frequent feeds of employment and earnings data and significantly improve the timeliness of the source earnings data.

Learner data is collated from returns by colleges with the provisional data collected to date generally published on a quarterly basis. Returns are not generally complete until up to six months after the end of the academic year, which runs from 1st August to 31st July.

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