

Comparing different types of qualifications: An alternative comparator

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Introduction

Returns to qualifications measure how much more is earned on average by people with a particular qualification compared to people with similar demographic characteristics who do not have the qualification. Awarding bodies and the national regulator do not generally use this research method in comparability studies. This article considers what returns to qualifications comparability research can offer awarding bodies and shows that it enables researchers to make comparisons which cannot be satisfactorily achieved by other methods, for instance, comparisons between different types of qualifications, occupations, sectors and progression routes. However, as with all research approaches, returns to qualifications has its limitations.

Background

The English qualification system is complex and for some time government reports have noted this complexity (Foster, 2005; Leitch, 2006; Wolf, 2011). There are thousands of qualifications of several types and at different levels; for details see Isaacs (2010) and Ofqual (2010a to c, 2011a). A glossary of qualifications and qualification types is given in Appendix 1, and a glossary of technical terms, common abbreviations and acronyms relevant to this article is given in Appendix 2.

Different types of cognate qualifications can lead to the same job or programme of study. The results of comparability studies contrasting such qualifications can highlight easy or difficult routes to jobs or further study, and the results may be provided to appropriate authorities who determine what action is necessary to reduce any disparity.

Research methods for comparing the quality of examinees' performance are frequently considered in the literature (e.g. Newton *et al.*, 2007) and used in comparability studies. Many of these methods are unsuitable when comparing qualifications that are not predominantly assessed by national examinations. For these comparisons an alternative comparator is required. An example of an alternative comparator, and the focus of this article, is *returns to qualifications*.

Customary comparators

The comparators listed below have often been used in comparability research:

- The demand of the examination items (e.g. QCA, 2006; Crisp and Novaković, 2009a and b)
- The quality of learners' performance as illustrated by their responses to examination items (D'Arcy, 1997; Bramley, 2005; Yim and Shaw, 2009)
- Prior measures of attainment (Bell and Dexter, 2000; Schagen and Hutchinson, 2007)
- Concurrent measures of attainment (Bell and Dexter, 2000; Murphy, 2007).

Each of the customary comparators has different requirements. A robust sample of examination items is needed if their demand is being contrasted. Similarly, a robust sample of learners' work is needed to compare their examination performance. Prior and concurrent measures of attainment both require large datasets with multiple measures of educational attainment.

The studies listed above compare the same type of qualification. Few studies comparing different types of qualifications utilise the customary comparators. Exceptions are that Guthrie (2003) and Arlett (2002; 2003) compared the quality of learners' performance in GCE versus VCE qualifications and Bell and Vidal Rodeiro (2006) used prior and concurrent measures in attainment to compare GCSE versus VGCSE performance in similar subjects.

There are some circumstances in which these customary comparators cannot be used. For example, studies based on comparing the quality of work produced require physical examples of that work, which might not be available. This can happen when performance is assessed by observing work-based practice, or after examination scripts have been destroyed. Appendix 3 displays the requirements for some specific comparability studies and lists some of the circumstances when these cannot be met.

When one or more qualification(s) in a comparison do not fit the requirements for the customary comparators an alternative comparator is needed. The focus of this article is an overview of an alternative comparator: the *returns to qualifications*. The article describes this comparator and analyses its strengths and weaknesses from a comparability research perspective.

Returns to qualifications

There is an established literature about returns to qualifications in economics (e.g. Psacharopoulos, 1947, 1981; Morgan and David, 1963; Ziderman, 1973; Dearden *et al.*, 2000; Conlon and Patrignani, 2010). This field of research is influential and has featured in government reviews such as Leitch (2006) and Wolf (2011).

Returns to qualifications are a relative statistical measure which show how much more on average is earned by people with a given qualification in contrast to people with similar demographic characteristics who do not have the qualification (Wolf, 2011).

A recent example of returns to qualifications research in the field of education can be found in Dolton *et al.* (2001) who applied several statistical models and contrasted returns to qualifications for men and women. They found statistically significant returns for non-government funded apprenticeships and degrees for men, and for degrees and NVQ level 2 or more for women. To date there is little awarding body research in this area. Arguably the exception is the study by Conlon and Patrignani (2010). They found that people with level 2 vocational qualifications showed a relatively strong return when compared to people with no

qualifications. Other examples of research and their findings are given in Table 1.

Table 1: Examples of returns to qualifications research and selected quotes

Returns to...	Example of comparison	Selected quotes
Types of qualification	Vocational vs. academic	"Considerable variation was however uncovered in the wage returns to different types of qualification, with academic qualifications generally earning higher rewards." (Sianesi, 2003, pp.1–2)
Level of qualification	Level 2 vs. level 3	"In aggregate, the returns to qualifications are quite similar for full-time men and women. The rate of return to level 1 qualifications is negligible or zero; while at level 2 and above, the returns are positive and significant, and quite substantial – around 13%–16% for both level 2 and level 3 qualifications, and rising to 23%–31% for level 4 and level 5 qualifications." (Dickerson and Vignoles, 2007, p.V)
Awarding bodies	EdExcel vs. City and Guilds vs. RSA	"[R]eturns associated with level 2 vocational qualifications are relatively strong compared to those in possession of no formally recognised qualifications, with individuals in possession of RSA Level 2, City & Guilds Level 2 and BTEC Level 2 qualifications achieving 38.4%, 15.6% and 13.1% earnings premiums." (Conlon and Patrignani, 2010, p.6)
Occupations	Sales vs. Machine operators	"[W]e find that in particular occupations (such as skilled manual occupations and personal services) and particular industries (such as public administration, education and health), the estimated returns to NVQ2 qualifications are positive and statistically significant." (McIntosh and Garrett, 2009, p.79)
Sectors	Automotive skills vs. Financial Services	"Only the Energy & Utility Skills and People 1st sectors show a positive significant return to level 2 vocational qualifications for males, for example. For women, the return to level 2 vocational qualifications is positively significant in just one SSC, Automotive Skills (albeit with the relatively low sample size of 47)." (Dickerson and Vignoles, 2007, p.15)
Qualifications in different years	Year vs. year	"The rate of return to all levels of education for men remained fairly stable or slightly increased over time while the returns to all educational qualifications noticeably declined for women." (Silles, 2007, pp.411–412)
Progression route	Vocational vs. academic	"For men on the vocational route the extra pay which results from progressing to a higher qualification is less impressive. Having an HND/HNC rather than an OND/ONC yields only an extra 11 percentage points, compared with the 16 percentage point gain in earnings when a man with 2 A levels attains a first degree." (Robinson, 1997, p.12)

Note that these quotes are only a small selection of the findings reported in the returns to qualifications literature and do not indicate overall patterns of findings.

How is the alternative comparator interpreted?

There are several ways of interpreting returns to qualifications. The research often construes them as a proxy for people's productivity (Stasz, 2001; Sianesi, 2003). Within this broad agreement there are two main contrasting hypotheses: 'signalling' and 'human capital'. The signalling hypothesis proposes that returns to qualifications indicate the learners' skills and motivation levels or productivity from *before* entering the qualification's learning programme, and that the qualification does not necessarily improve productivity. The human capital hypothesis proposes that education leading to qualifications improves learners' productivity, which leads to higher earnings and thereby higher returns to

qualifications. The weight of evidence supports the human capital hypothesis (Machin and Vignoles, 2005). For further detail on the debate see Sianesi (2003) or Powdthavee and Vignoles (2006). If the human capital hypothesis is correct it makes returns to qualifications a more useful comparator for awarding body purposes, as they would then indicate the value of the learning associated with the qualification.

When qualifications give similar returns they are comparable in terms of economic value and the productivity of the qualification holders is comparable. This is not to say that the knowledge, skills, competence and personality attributes of people with different qualifications are the same or similar. Therefore the results of returns to qualifications analyses will not necessarily align with outcomes from other comparability research using the customary comparators.

Methods for researching returns to qualifications

Usually the research involves analysing longitudinal survey data. The most suitable UK longitudinal datasets are the Youth Cohort Study, the National Child Development Study, and the 1970 British Cohort Study (Wolf, 2011). These datasets are detailed and comprehensive. For instance, the 1970 British Cohort Study achieved a cross-sectional sample of 16,571 in 1970 and 11,261 in 1999–2000 (Centre for Longitudinal Studies, 2009). The Universities of Essex and Manchester (2008) provide information about the 1970 British Cohort Study including a follow-up 38 years later in 2008–2009. The follow-up dataset contains variables representing type of residence, sex, income from earnings, socio-economic group, managerial duties and health. Additionally, it contains variables about qualifications gained, dates they were achieved, whether study was full or part time and who paid for them. The survey covers A levels, GCSEs, O levels, NVQs, degrees, City and Guilds, RSA, HNC, HND and other qualifications.

Comparing the average wage of people with a qualification with the average wage of similar people without the qualification (Wolf, 2011) is a staple of investigation. This is achieved by creating samples from within the data, one with and one without the qualification, which have similar profiles on other variables.

A family of statistics known as regression or regression modelling is utilised to calculate returns to qualifications. An attribute of regression is that analysts can control for the effects of variables (e.g. García-Mainar and Montuenga-Gómez, 2005). The effect of the controlled variable is removed to avoid influencing the effect of the variables under investigation. For example, Robinson (1997) controlled for *years of experience* to contrast returns to qualifications thereby avoiding a comparison of the effects of both *years of experience* and *qualifications* on wages. This is important because unqualified people are often older. Dearden *et al.* (2002) used the 1991 sweep of the National Child Development Study and the 1998 Labour Force Survey and found that the returns to vocational qualifications were more similar to those of academic qualifications when they controlled for time taken to gain the qualification. Length of time to gain a qualification is important to control as vocational qualifications often take a shorter time to gain than academic qualifications. Dearden *et al.* (2002) also investigated the bias that can occur when regression models do not control for variables like *ability* and *measurement error*. They found that returns to qualifications analyses that did not control for ability tended to be biased upwards, and those that did not control for *measurement error* tended to be biased downwards. These biases might cancel one another out. They analysed the National Child Development Study data controlling for *ability* and

measurement error and the Labour Force survey data without controlling for either. The results were similar suggesting the biases do indeed offset each other. In summary, returns to qualifications analyses which do not control for variables such as *ability* and *measurement error* can sometimes give reasonable estimates of returns to qualifications.

Some studies aggregate qualifications together to calculate returns to groups of qualifications. Different aggregations of qualifications enable comparisons between:

- Types of qualification
- Levels of qualification
- Awarding bodies
- Occupations
- Sectors
- Different years
- Progression routes

Examples of results from research comparing the above were given in Table 1 previously.

Strengths of returns to qualifications as a comparator

Returns to qualifications are a valid comparator even when comparing qualifications which are not cognate, as in McIntosh and Garrett (2009), and Dickerson and Vignoles (2007). In contrast the customary comparators such as quality of learners' performance and the demand of examination items tend to be used to compare cognate qualifications. Examples include D'Arcy (1997) and Yim and Shaw (2009).

An advantage of returns to qualifications is that they are often more independent of the awarding body and qualification system than the customary comparators. The reasons for the customary comparators being embedded in the awarding body and qualifications system are as follows:

- Judgements about the demand of items and the quality of learners' performance are often made by senior assessors, moderators and verifiers from the qualifications. Bramley (2007) considered the design of fourteen inter-board comparability studies and reported that in ten of the fourteen studies no independent judges participated and in the four studies using independent judges less than a third of the judges were independent, although Forster and Gray (2000) found no evidence that the judgements made by independent judges were different from those made by board-affiliated judges.
- Measures of prior and concurrent attainment are often derived from qualifications or examinations offered by the main awarding bodies or the regulator. Examples include Bell and Dexter (2000), Elliott *et al.* (2002) and Bell (2000).
- The customary comparators can be an accumulation of awarding body/qualifications system decisions (i.e. the decisions by senior assessors, moderators and verifiers along with awarding body staff).

Returns to qualifications, however, are mostly the outcome of decisions by employers. In summary, many employers' decisions contributing to the measure of returns to qualifications renders it more independent than the customary comparators.

There are strategies for increasing the independence of the customary comparators. All experts judging item demand and the quality of learners' performance can be recruited using the criteria that they are experts in

the field but independent of the awarding bodies and qualification system under investigation. Some studies claim to use only independent judges but the criteria for recruitment are not explicit, so the exact meaning of 'independent' is unclear – see, for example, Ofqual (2010d). The measures of prior or concurrent attainment can be chosen from outside the awarding body or qualifications system, such as a reference test developed by an independent group. Murphy (2007) provides a comprehensive discussion of reference tests.

Weaknesses of returns to qualifications as a comparator

There are multiple opinions regarding what returns to qualifications measure – for example, the signalling versus human capital hypothesis. Some interpretations are better than others for awarding body purposes, as discussed above.

Strengths of research methods associated with returns to qualifications

Exploiting large longitudinal datasets makes returns to qualifications a robust and powerful research technique. The longitudinal data is preferable to self-reported data which relies on people remembering information, such as examination results (Wolf, 2011). This is a strength of the approach as the fallibility of self-reported examination results is well known. For instance, Kuncel *et al.* (2005) considered several studies and found that the validity of self-reported test scores, grade point averages and class ranks were moderated by school performance and cognitive ability; they suggest using such data with caution. A further strength is that analysts can control for confounding variables, which facilitates purer measures of returns to qualifications (see earlier). A final strength is that the qualifications can be aggregated to make several different types of comparison, for example, comparisons between different levels, occupations, sectors and progression routes, as shown in Table 1. These are infrequently researched by awarding bodies and therefore the returns to qualifications research is offering new comparability evidence.

Weaknesses of research methods associated with returns to qualifications

There are several weaknesses in the returns to qualifications research. Qualifications and other variables do not necessarily 'cause' returns to qualifications (Sianesi, 2003). Sianesi is concerned about how people might apply the repeated research finding that NVQ level 1 and level 2 qualifications are associated with negative returns (e.g. Jenkins *et al.*, 2007 in Wolf, 2011). If NVQs are believed to cause the negative returns, then the qualifications are arguably valueless. This is not necessarily the case, as people with NVQ level 1 and 2 have a higher probability of subsequent employment than those in matched groups without the qualifications (e.g. Dearden *et al.*, 2000, and Jenkins *et al.*, 2002, in Sianesi, 2003).

Another weakness is that some variables can be influenced by unobserved variables. McIntosh and Garrett (2009) describe steps that can be taken to try to reduce the likelihood of this happening.

Inferences about skills, knowledge, motivation and productivity can be somewhat oversimplified by returns to qualifications analyses. Personality characteristics, competence, skills and knowledge are often treated as unidimensional; that is, they are combined into one measure of returns to qualifications (Stasz, 2001). This is not necessarily realistic as there is evidence that some academic performance is

multidimensional (e.g. Jackson, 1985) and research indicates that personality attributes are multidimensional (e.g. Gow *et al.*, 2005). On the other hand educational attainment and personality attributes are connected (Chamorro-Premuzic and Furnham, 2003; Richardson and Abraham, 2009) and personality theorists have research evidence for a personality disposition which integrates most general non cognitive dimensions of personality (e.g. Musek, 2007). Therefore, one scale for returns to qualifications might not be a pure measure, but given how knowledge, skills and personality can be linked, returns to qualifications is likely to be a reasonable proxy for productivity. A related point is that returns to qualifications research assumes that the learning from a qualification transfers to the workplace (Stasz, 2001). However, research shows that knowledge, skills and so on from one context do not readily transfer to another (Lave, 1988; Carraher, 1991).

The statistical results are somewhat dependent on how the statistical model is specified (Wolf, 2011). It is possible to have two valid statistical models using the same data which produce different results (Wolf, 2011); therefore reoccurring patterns of results are more trustworthy than findings from one statistical model (McIntosh and Garrett, 2009).

Conclusion

Returns to qualifications are a statistical measure contrasting the average earnings (often interpreted as productivity) of people who have a particular qualification(s) with the average earnings of those without the qualification. Thus far, returns to qualifications are relatively unexplored by awarding bodies, although they are prominent in government reviews of vocational qualifications. This comparator enables researchers to make comparisons which cannot be achieved by other methods and has the advantage that it is more independent than customary comparators used in many comparability studies. The alternative comparator and associated methods have strengths and weaknesses but provide some robust comparability evidence. The strongest comparability evidence is when there is a clear pattern in the results of several studies using different established research methods and independent data sets. Therefore results from returns to qualifications research combined with results from the customary comparators would provide a strong research evidence base.

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APPENDIX 1:

GLOSSARY OF QUALIFICATIONS AND QUALIFICATION TYPES

A level	General Certificate of Education Advanced Level. Typically taken by 18 year olds after a two year study programme. Currently the assessments are unitised and some interim examinations contributed to final grades. A type of general qualification.
BTEC	Business and Technology Education Council. Sometimes used to refer to a type of vocational or work related qualification. For details see Bates (1990) and Directgov (2011a).
City and Guilds	Awarding body. Sometimes used to refer to a type of vocational or work related qualification. For details see Directgov (2011a).
CSE	Certificate of Secondary Education. Typically taken by 16 year olds after a two year study programme. O levels catered for the higher ability students. Lower ability students took the Certificate of Secondary Education. The qualification was available between 1965 and 1987. For details see University of Hull (2007). A type of general qualification.
GCE	General Certificate of Education (see also O level and A level).
GCSE	General Certificate of Secondary Education. Typically GCSE is taken by 16 year olds as part of a two year course. Sometimes the examinations are all taken at the end of the two years and at other times they are spread throughout the two years. The qualification replaced O levels and CSEs in England in 1988. A type of general qualification.
GNVQ	General National Vocational Qualifications. They were designed to be an alternative to GCSE and GCE, but also to be different in size, content and assessment approach (Coles and Matthews, 1995). These qualifications are no longer available.
HND/HNC	Higher National Diploma/Higher National Certificate. Type of work related or vocational higher education qualification. For details see Directgov (2011b).
NVQ	National Vocational Qualifications. NVQs are available at several levels and are therefore taken by learners of varied age. NVQs are based on national occupational standards. They are competence based qualifications. Wolf (2011) explains that NVQs are now scheduled to disappear with the exception of some qualifications preserved by some of the Sector Skills Councils. A type of vocational qualification.
O level	General Certificate of Education Ordinary Level. The last year of national testing of O levels was 1987. Typically 16 year olds took the examinations after two years of study. O levels catered for the higher ability students. Lower ability students took the Certificate of Secondary Education. A type of general qualification.
OND/ONC	Ordinary National Diploma/ Ordinary National Certificate. A type of vocational qualification, a BTEC qualification.
RSA	RSA Examinations Board or Royal Society of Arts Examinations Board. This awarding body is now part of OCR (Oxford, Cambridge and RSA examinations). Sometimes used to refer to a type of vocational or work related qualification.
VCE	Vocational Certificate of Education. VCEs replaced GNVQs at level 3. These are no longer available. A type of vocational qualification.
VGCSE	Vocational General Certificate of Secondary Education. GCSEs in vocational subjects were introduced in 2000. However, the term 'vocational' was dropped in 2004. A type of vocational qualification.

APPENDIX 2: GLOSSARY OF ASSESSMENT TERMS USED IN THIS ARTICLE

Accredited qualification	A qualification and specification are accredited by Ofqual when they meet regulatory criteria. For details see Ofqual (2010e, 2011b).
Accreditation of prior (experiential) learning	The recognition (award) of academic credit for demonstrated learning and achievement from formal education, life or work. The process is used by learners to gain entry to a learning programme or to claim credit for part of a qualification.
City and Guilds	Awarding body.
Cognate	The same subject/discipline/occupation.
Comparability	Extent of the similarity or equivalence of qualification(s) or unit(s).
Comparator	A device for comparing qualification(s)/unit(s) and determining their comparability. It might be a numerical measure like returns to qualifications or a concept like factual recall.
Controlled assessment	Assessments taken under supervised conditions. They are set by the awarding body and assessed by the learner's teacher or set by the learner's teacher and assessed by an assessor contracted by the awarding body. Many UK qualifications now have controlled assessment rather than coursework.
Coursework	Assessments, often project work, which were devised by the learner/teacher/awarding body within awarding body guidelines. Generally assessed by the learner's teacher.
Demand	The level of knowledge, skills and competence required of typical learners.
External moderator	A subject/occupational expert contracted by the awarding body to check the assessment judgements of assessors employed by schools, colleges and employers.
Internal moderator	A subject/occupational expert employed by schools, colleges and employers to check the assessment judgements of assessors from the same organisation.
External verifier	A subject/occupational expert contracted by the awarding body to check the assessment judgements of assessors employed by schools, colleges and employers. The external verifiers also consider audit trails.
Internal verifier	A subject/occupational expert employed by schools, colleges and employers to check the audit trail and assessment judgements of assessors from the same organisation.
NQF	National Qualifications Framework. For details see Ofqual (2011).
Ofqual	National regulator of qualifications in England and vocational qualifications in Northern Ireland.
Productivity	The skills, knowledge, competence and personality attributes a person uses in a job to produce goods and services of economic value.
QCA	Qualifications and Curriculum Authority. QCA was the predecessor of Ofqual.
QCF	Qualifications and Credit Framework. For details see Ofqual (2011a).
Qualification level	Qualification levels are within qualification frameworks (e.g. NQF, QCF). Each level contains qualifications deemed to be of similar demand. The qualifications in a level vary in subject, content and assessment design.
Returns to qualifications	A statistical proxy of the productivity of people who have a particular qualification(s) compared with the productivity of those without the qualification.
RSA	RSA Examinations Board or Royal Society of Arts Examinations Board. This awarding body is now part of OCR (Oxford, Cambridge and RSA examinations).
SSC	Sector Skills Council. SSCs are employer driven, UK wide organisations that aim to ensure the UK has the skills needed for the present and the future, and to improve productivity and performance. Each SSC covers a particular industry. For details see UK Commission for Employment and Skills (undated).
Type of qualification	Qualifications with a particular characteristic, or from a particular grouping e.g. A levels, vocational qualifications, BTEC.

**APPENDIX 3:
REQUIREMENTS FOR COMPARABILITY STUDIES AND EXAMPLES OF CIRCUMSTANCES WHEN THESE ARE NOT AVAILABLE**

<i>Comparator</i>	<i>What is needed</i>	<i>Circumstances when these are not available</i>
Demand of the examination items	<p>The examination items (or equivalent) answered by many learners.</p> <p>A representative sample might suffice.</p>	<ul style="list-style-type: none"> • When performance is assessed by observing work practice in situ and asking supplementary questions as needed. Examples include many NVQ assessments. • Internally assessed units when the assessment task is devised or adapted by the learner/teacher and the learner's performance is assessed by the teacher. These include some coursework/controlled assessment tasks in GCSE, Diplomas and other qualifications. An example of a study when researchers attempted to collect internally assessed tasks for a vocational qualification in administration, with limited success, is Crisp and Novaković (2009a). • Cases of the accreditation of prior (experiential) learning.
Quality of learners' performance	<p>A representative sample of learners' responses to the examination items.</p>	<ul style="list-style-type: none"> • Once scripts are destroyed. Scripts from examinations are destroyed after a certain length of time once certificates have been issued. The exception is a small number of scripts on some grade boundaries. • For some internally assessed units. The awarding body has limited access to the artefacts produced by learners. The artefacts are often retained by schools, colleges or learners. Crisp and Novaković (2009a) collected artefacts for a research study with limited success. • The assessment does not require the learners to produce an artefact or a recording of the learners' performance such as a video of a drama performance. Examples include some NVQ assessment as mentioned above.
Prior measures of attainment	<p>Marks or grades from both prior measures of attainment and the current mark or grade for each learner or for a representative sample of learners.</p>	<p>When the qualifications/learners under investigation are not well represented in databases with multiple measures of educational attainment. There are several government owned databases which have prior, current and concurrent measures of attainment, examples include the National Pupil Database (NPD) and Individualised Learner Record (ILR). For details of the NPD see Palmer (undated) and for ILR see The Information Authority (undated).</p>
Concurrent measures of attainment	<p>Marks or grades from both prior measures of attainment and the current mark or grade for each learner or for a representative sample of learners.</p>	<p>However, less well represented learners are:</p> <ul style="list-style-type: none"> • Not from state maintained schools (independent schools are not required to follow the National Curriculum and to take the statutory national tests) • Not of typical test taking age • Too old to have key stage test results • Taking certain qualifications, usually vocational qualifications • Taking unaccredited qualifications