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#### ABSTRACT

This paper examines the earnings returns to learning that takes place following the conventional 'school-to-work' stage of the life-course. We operationalise such 'lifelong learning' as the attainment of certified qualifications in adulthood, following the completion of the first period of continuous full-time education. Using data from the British Household Panel Survey (BHPS) for the period 1991–2006, our approach and findings represent an important addition to the existing evidence base. By using annual data, we are able to employ the fixed effects estimator, which eliminates the problem of time-invariant unobserved heterogeneity. Our dynamic specification uses a lag structure to consider how earnings returns evolve in the medium and longer run, whilst also controlling for wage trends which were evident *prior* to qualification attainment. Our results show a medium-run return for women of 10% on hourly wages. For men, initial suggestions of a similar positive return are eliminated once pre-qualification trends are taken into account. This suggests that adult learning has a causal effect on women's subsequent earnings but, for men, any apparent gain is due to selection.

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#### 1. Introduction

Economists have traditionally viewed educational investment as occurring in a discrete stage prior to entry into the labour market (Becker, 1964). However, recent academic and policy debate has emphasised the importance of learning which continues throughout an individuals' working life, and possibly beyond (Department for Business

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Innovation & Skills, 2009; Schuller & Watson, 2009). The rationale for this focus on what has come to be referred to as 'lifelong learning' rests on the benefits that education and training in later life are argued to provide for both the individual and for society. For individuals, it is contended that the accumulation of human capital through education and training will yield economic returns, even in later adulthood (Department for Education & Employment, 1998). At the societal level, it is argued that a highly skilled and well-trained workforce is essential for achieving competitiveness in global markets and for enabling the transition to a knowledge-based economy (Leitch, 2006). Yet, despite the widespread currency of the notion that education and training will yield financial pay-offs to learners in later adulthood, the existing empirical evidence in support of this idea is, at best, mixed.

Lifelong learning, in its broadest sense, refers to the accumulation of knowledge and skills throughout a person's life, particularly beyond early adulthood (Fauré et al., 1972). For the purposes of this study we adopt a narrower

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definition based on 'certified learning' and consider qualifications obtained in adulthood, following the cessation of the first period of continuous full-time education. We do this for two primary reasons. The first is pragmatic: whilst it is extremely difficult to operationalise lifelong learning of an informal nature (Field, 2006) an individual's gualification attainment can be measured. The second is a desire for our findings to connect directly with the educational policy context which has seen a growing emphasis on the importance of lifelong learning in countries throughout the world (OECD, 2007). In the UK, for example, recent Government policy was based on explicit targets for the number and level of gualifications to be achieved at a population level (HM Treasury, 2007). It is of particular importance, therefore, to understand the economic returns to qualifications obtained by adults, during a period in which accredited adult learning was prioritised and subsidised by the government.

Although the specific policy context for our research is the United Kingdom, this paper also speaks to the literature on the returns to human capital accumulation after the end of completed schooling, following papers in this tradition by Ashenfelter and Card (1985), Lynch (1991), Kane and Rouse (1995), Loewenstein and Spletzer (1999) and Heckman and Smith (1999). As we shall see, internationally, the evidence on the returns to human capital accumulation later in the life-course shows a positive effect with regard to earnings, although this varies depending on the specific learning that is undertaken. In the UK, the evidence is considerably less robust and a key contribution of this paper is to add clarity to the current mixed picture (De-Coulon & Vignoles, 2007; Jenkins, Vignoles, Wolf, & Galindo-Rueda, 2003 and very recently Dorsett, Lui, & Weale, 2010). Our empirical analysis makes use of rich panel data, which measures earnings and gualification attainment at the individual level annually, over a 16year period from 1991 to 2006. Applied economists have long been concerned about the biasing effect of unmeasured ability in the assessment of the returns to education (Griliches, 1977). The structure and sequencing of our data allows us to implement a considerably more robust defence against unobserved confounders than has been evident to date (see Harmon et al., 2003, p. 146).

The remainder of the paper is structured as follows. In the next section we describe the system of schooling and qualification attainment in the UK during the period covered by our analysis and we review the existing empirical literature on earnings returns to adult learning. Section 3 provides detail of the data and key measures to be used in our analysis, whilst Section 4 describes our modelling and identification strategy. Section 5 presents our primary results and we conclude with a consideration of the implications and limitations of our findings for our understanding of the economic benefits of lifelong learning.

#### 2. Background

## 2.1. The policy context: education and qualifications in the UK 1991–2006

Lifelong learning in this paper is concerned with the acquisition of both academic and vocational qualifications

in a single country over a relatively long period of time. It is, therefore, necessary to provide a brief account of the policy context in which these qualifications were attained and a description of the sorts of skills and knowledge they were intended to accredit. The majority of UK academic qualifications are obtained as part of the initial progression through the education system, although they can be taken by anyone, at any time (for a fee). The first external examinations are the General Certificate of School Education exams (GCSEs) which are taken at the end of compulsory schooling, usually at age 16. Students are regarded as successful at this stage if they obtain five or more GCSEs at grades A-C. Currently 75% of the age cohort achieves this milestone, and they are described as gualified at National Qualifications Framework (NQF)<sup>1</sup> level 2. Those who obtain GCSES below this level are qualified at NQF level 1. If students proceed to achieve A levels, which generally takes two further years, they are gualified at level 3. Upon completion of A levels, students can opt to undertake degree level study, an option taken up by around 40% of the cohort in recent years (see Blanden & Machin, 2004, for a discussion of trends in University participation). Undergraduate degrees generally take three years to complete in England and Wales, whilst Scottish degrees take four years. Undergraduate degrees are classified as NQF level 4 and postgraduate qualification is categorised as NQF level 5. A levels and degrees are all available to adult learners through participation at colleges and universities, either on a parttime or a full-time basis.

The UK vocational qualifications system is very complex and diverse, with approximately 100,000 registered qualifications currently available.<sup>2</sup> Of particular interest are National Vocational Qualifications. These are mainly awarded at NFQ levels 1-3 and are generally assessed through a portfolio of evidence. Consequently, delivery approaches for these qualifications are diverse. They can be undertaken full-time or part-time and with or without college support. There is a large number of subjects available, with 1288 separate NVQs offered in 2003 (UK Department for Education and Skills, 2003). Many employers now require employees to hold particular NVQs, for example in health and safety, or in the use of specialist equipment, and we suspect that these will comprise a large part of the lifelong learning that we observe. Vocational qualifications can also be divided into the five NQF levels, which enables a simplification of the entire system and a rough approximation between academic and vocational qualifications. A summary of how this mapping works, with some examples, is provided in Table A1.

As we noted earlier, the UK Government increasingly promoted adult attainment of qualifications from the late 1990s onward. For example, the 2001 'Skills for Life' initiative aimed to increase the qualifications of the lowest skilled, with a target of 2.25 million individuals obtaining a new qualification by 2010. Similarly, the Public Services Agreement Skills Target (HM Treasury, 2007) sets out a

<sup>&</sup>lt;sup>1</sup> The NQF has now been replaced in 2010 by the Qualifications and Credit Framework which includes 8 levels of qualification.

<sup>&</sup>lt;sup>2</sup> The Register of Regulated Qualification (April 2011).

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