A microfoundation for increasing returns in human capital accumulation and the under-participation trap

Alison L. Booth[a,b,*], Melvyn Coles[c]

[a]*Economics Department, University of Essex, Wivenhoe Park, CO4 3SQ, UK*
[b]*Australian National University, Canberra, ACT, Australia*
[c]*I.C.R.E.A. and I.A.E., Campus UAB, 08139 Bellaterra, Barcelona, Spain*

Abstract

This paper considers educational investment, wages and hours of market work in an imperfectly competitive labour market with heterogeneous workers and home production. It investigates the degree to which there might be both underemployment in the labour market and underinvestment in education. A central insight is that the ex post participation decision of workers endogenously generates increasing marginal returns to education. Although equilibrium implies underinvestment in education, optimal policy is not to subsidise education. Instead it is to subsidise labour market participation which we argue might be efficiently targeted as state-provided childcare support.
© 2007 Elsevier B.V. All rights reserved.

1. Introduction

This paper considers educational investment, wages and hours of market work in an imperfectly competitive labour market with heterogeneous workers and home production. It investigates the degree to which there might be both underemployment in the labour

---

*Corresponding author. The Australian National University, Research School of Social Sciences, HC Coombs Bldg, Economics program, Canberra, ACT 0200, Australia. Tel.: +61 2 6125 3285; fax: +61 2 6125 0182.
  E-mail address: albooth@essex.ac.uk (A.L. Booth).

market and underinvestment in education. A central insight is that the ex post participation decision of workers endogenously generates increasing marginal returns to education. This non-convexity can result in a large discontinuity in educational choice and labour market participation across workers. The paper shows that for some workers, a competitive labour market would imply they invest significantly in education and participate with a high probability in the labour market. But wages below marginal product (in a non-competitive labour market) and increasing returns to education together imply a non-marginal switch to low educational investment and home production. These large substitution effects yield large welfare losses and so corrective taxation plays an important role. Although there is underinvestment in education, optimal policy is not to subsidise education. Instead it is to subsidise labour market participation, which we argue might be efficiently targeted as state-provided childcare support.

The paper considers a hold-up problem where in the first phase of their lives, youngsters increase their future workplace ability by investing in general skills. Those investments are made prior to becoming employed in the workplace. Clearly some skill investments, such as primary school education in literacy and numeracy skills, are invaluable both at home and in the workplace. But the focus here is on educational choice past the compulsory school level, by which time literacy and numeracy skills have presumably been well honed. Instead students might further invest in a university degree in mathematics or a qualification in information technology, imbuing them with expertise that is valuable in the workplace but is unlikely to increase their skills in the home.

A central feature of the model is that there are increasing marginal returns to education. We stress that these increasing returns do not arise because we assume a Mincer wage equation with increasing returns. Indeed the arguments are consistent with a Mincerian wage rate $w = a + e$, where the wage rate w depends on endowed ability a and is linearly increasing in education e. But such a wage equation does not describe the marginal return to education. For example, the person who intends to specialise entirely in child rearing and home-making has a zero financial return to investing in workplace skills, regardless of the size of the Mincer wage effect. The marginal return to education depends both on the Mincer wage effect and expected labour supply, where increased labour supply implies human capital investments are "used" more intensively in the workplace. We shall show there are three reasons for increasing returns to education. First, there are increasing marginal returns to education because of a *participation effect*. More highly skilled workers earn higher wages in the workplace and so are more likely to participate in the workplace, thereby raising the ex ante expected returns to human capital investment. Second, increasing returns arise through an increasing *labour supply effect*, where more educated workers may find it worthwhile to work longer hours. But with a frictional labour market there is a third reason for increasing marginal returns to education—an increasing *wage competitiveness effect*. We show that firms bid more competitively for the worker's services as the value of employment increases. As wage compression decreases at higher productivity levels, the marginal return to education increases as education increases.

A second important feature of the paper is that it assumes workers have different productivities both at home and in the workplace. We introduce this assumption not only because it is realistic, although that is clearly an advantage.[1] But more importantly, it

---

[1] High returns to home productivity might be realised by those involved with care of young children or elderly parents, or for individuals with a taste for leisure or for home renovations, or for those with a strong aversion to