Review of Economic Dynamics 14 (2011) 577–591

Contents lists available at ScienceDirect

Review of Economic Dynamics

www.elsevier.com/locate/red

Human capital accumulation and the intertemporal elasticity of substitution of labor: How large is the bias?

Johanna Wallenius *,[1]

Department of Economics, Stockholm School of Economics, Box 6501, 113 83 Stockholm, Sweden

ARTICLE INFO

Article history:
Received 27 May 2010
Revised 16 June 2011
Available online 30 June 2011

JEL classification:
E24
J24

Keywords:
Intertemporal elasticity of substitution
Human capital
Life cycle
Labor supply

ABSTRACT

I consider two different skill accumulation technologies, learning by doing and Ben-Porath type training. The effect of human capital accumulation in the form of learning by doing is to increase the labor supply elasticity estimate by a factor of 2.1 relative to the estimate that ignores human capital accumulation. The results are similar for the Ben-Porath type training technology, although the estimate of the bias is somewhat higher.

© 2011 Elsevier Inc. All rights reserved.

1. Introduction

Following Ghez and Becker (1975) a large literature has sought to identify the intertemporal elasticity of substitution for labor from the variation of wages and hours over the life cycle. Notably, MaCurdy (1981) and Altonji (1986) were the first to implement this estimation on individual level panel data.[2] The standard assumption in this literature is that wage changes over the life cycle are exogenous. This approach yields very small elasticities for prime aged males, in the range of 0.3 or less. The result is driven by the fact that hours of work vary little over the life cycle, whereas wages increase rather steeply. The assumption of exogenous wage growth might, however, lead to downward biased estimates of the intertemporal elasticity of substitution parameter.

The objective of this paper is to assess the magnitude of the bias on the intertemporal elasticity of substitution of labor supply resulting from the omission of human capital accumulation. To that end, I develop a simple, deterministic life cycle model for an individual agent that I then use to estimate this bias on cohort data for individuals aged 20–62. I consider two alternative skill accumulation technologies, learning by doing and Ben-Porath type training. My results indicate that the estimate of the intertemporal elasticity of substitution increases by a factor of 2.1 after the addition of endogenous human capital accumulation in the form of learning by doing relative to the benchmark with no-human capital. The impact of Ben-Porath type training on the labor supply elasticity is similar, with the estimate increasing by a factor of 2.6 relative to the benchmark.

* Fax: +358 6 434 2444.
E-mail address: johannakristiinawallenius@gmail.com.

[1] I thank Richard Rogerson for his invaluable guidance and comments regarding this paper. I thank the editor and two anonymous referees for their useful suggestions in improving this paper. I also thank the participants of the 2nd Nordic Macroeconomic Symposium and the Arizona State University macroeconomic workshop for their comments. I gratefully acknowledge financial support from the Yrjö Jahnsson Foundation.

[2] See Pencavel (1986) for a more complete survey of this literature.

1094-2025/$ – see front matter © 2011 Elsevier Inc. All rights reserved.
doi:10.1016/j.red.2011.06.002

In relating these results to those in the literature, it is worth mentioning that Heckman (1976) was the first to note that the assumption of exogenous wages may negatively bias labor supply elasticity estimates. The first paper to provide a quantitative estimate of this bias was Imai and Keane (2004), who did so in the context of a learning by doing model. They estimate the labor supply elasticity at around 3.8, implying a much larger bias than what my results indicate. The complexity of their framework makes it difficult to know what is driving their results. Moreover, the poor out-of-sample performance of their model is somewhat of a red flag. The objective of this paper is to construct a simpler and more transparent framework to uncover the key economic forces and their interaction.

My results show that the magnitude of the bias resulting from the omission of human capital accumulation depends critically on the portion of the life cycle that estimation is based on. The estimates of the bias are largest when estimation is based on data for only the early part of the life cycle. Specifically, when limiting the targeted age range to 20–36, as in Imai and Keane,[3] I get a bias of a factor 5.3 from the omission of human capital accumulation in the form of learning by doing. This, however, is ill advised, as it results in hours worked declining much too steeply relative to the data at older ages. Furthermore, I find that there is some tension in matching the two halves of the life cycle profile for hours worked. In particular, if one matches the later part of the life cycle for hours worked then the early part does not look so good, and if one matches the early part then the later part does not look so good. The nature of the mismatch, however, is most severe when one estimates on early ages and then extrapolates to later ages.

An outline of this paper follows. Section 2 presents the models for the two skill accumulation technologies, while Section 3 outlines the data. Section 4 discusses the method used to select parameter values for the quantitative analysis. Section 5 presents the main results. Section 6 discusses the role the length of the targeted data series plays, while Section 7 provides some sensitivity analysis. Section 8 concludes.

2. Models of human capital accumulation

In this section I present two models corresponding to the alternative skill accumulation technologies: learning by doing and Ben-Porath type training. I describe the learning by doing model in more detail, and as it pertains to the Ben-Porath type training model only highlight the differences between the two models. The models are purposefully stylized along several dimensions to increase their transparency. The exercise is one of assessing the bias on labor supply elasticities resulting from the omission of human capital accumulation, not of estimating the labor supply elasticity per se.

2.1. Learning by doing

Consider a deterministic, discrete-time model for an individual agent. I assume that the individual is endowed with one unit of time at each date. I impose retirement at an exogenously determined age. Letting t denote age, the individual has preferences over sequences of consumption (c) and hours worked (h) given by:

$$\sum_{t=0}^{T} \beta^t \big[u(c_t) - v(h_t)\big], \tag{2.1}$$

where β is the discount factor. The functions u and v are both twice continuously differentiable and increasing, u is concave and v is convex. Each period there are markets for consumption, labor services and borrowing/lending.[4] The wage per unit of labor services, w, and the interest rate on borrowing/lending, r, will be assumed to be constant.[5] The individual faces a sequence of budget equations given by:

$$c_t + a_{t+1} - (1+r)a_t = ws_t h_t, \tag{2.2}$$

where a_t is the agent's asset holdings at age t. I assume that individuals must have non-negative assets at death. The observed wage per unit of time supplied to the market at age t is the product of the human capital stock, s_t, and the wage per unit of labor services, w.

Human capital evolves according to a human capital production function:

$$s_{t+1} = G_t(s_t, h_t). \tag{2.3}$$

The function is indexed with t to reflect the possibility that age influences learning. By choosing units for human capital, I can normalize w to equal 1. I do this in what follows.

[3] They use NLSY data for ages 20–36 only.

[4] In Section 7, I explore the implications of borrowing constraints.

[5] I am following Imai and Keane (2004) in assuming that w is constant. It has been argued that the skill price of human capital may not be constant. See for example Heckman and Sedlacek (1985), Heckman and Scheinkman (1987) and Heckman et al. (1998).

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات