



# Unemployment benefits, job protection, and the nature of educational investment<sup>☆</sup>

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## HIGHLIGHTS

- We examine a matching model of unemployment with educational investment.
- Education determines the scope (or adaptability) and intensity of human capital.
- Match surplus and the return to adaptability skills are positively related.
- Unemployment benefits and dismissal costs reduce match surplus.
- Covering the risk of unemployment makes human capital more specialized.

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## ABSTRACT

This paper examines the impact of labor market institutions covering the risk of unemployment on the nature of educational investment. We offer a matching model of unemployment in which individuals of a given education determine the scope (or adaptability) and intensity (or productivity) of their human capital before entering the labor market. Our model features an increasing relationship between match surplus and the return to adaptability skills. This relationship explains why matching frictions promote adaptability skills instead of productivity skills, and why unemployment benefits and job protection create the incentive for productivity skill acquisition.

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## 1. Introduction

Labor market institutions (LMIs) and the magnitude of educational investment in specialized human capital have been put forward to explain the relatively low performance of a number of European labor markets since the end of the 1970s. On the one hand, the generosity of unemployment insurance and the strictness of employment protection legislation tend to favor the persistence of high unemployment rates

while slowing down the job reallocation process necessary to sustain high productivity growth (see [Ljungqvist & Sargent, 1998](#); [Mortensen & Pissarides, 1999](#); [Nickell, 1997](#)). On the other hand, vocationally-oriented European schooling systems tend to alter workers' between-sector mobility (see [Krueger & Kumar, 2004](#)). These two lines of argument are separately advanced. The purpose of this paper is to examine how unemployment benefits and job protection affect the extent of specialization of schooling choices.

Unfortunately, it is hard to measure how specialized educational programs or the workforce human capital are. One possibility is to exploit the divide between vocational and general education. [Krueger and Kumar \(2004\)](#) use cross-section data. They point to the fact that student enrolment in vocational programs is much higher in Continental Europe than in the US. [Mukoyama and Sahin \(2006\)](#) show that there is a positive correlation between the generosity of unemployment compensation and the percentage of students enrolled in vocational programs. In the same vein, unemployment benefits and job protection are (weakly) positively correlated with the proportion of upper-secondary graduates with a vocational education. The 2000 correlation

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coefficient between the latter variable and the OECD unemployment benefit index or the OECD strictness of employment protection legislation are slightly below 30%.<sup>1</sup> A possible interpretation is that unemployment benefits and job protection are detrimental to general education. In turn, this may affect worker productivity and worker mobility across sectors during their entire working life.

The relationship between LMIs and the nature of human capital investment has already been examined in the context of on-the-job training. Wasmer (2006) focuses on the decision to invest in general versus specific human capital. Following Becker (1964), general human capital can be used everywhere in the economic system, whereas specific human capital can only be used within the firm. Wasmer shows that layoff taxes favor the acquisition of specific human capital.

The primary purpose of our paper is to complement Wasmer's contribution but instead focusing on human capital investments *before labor market entry*, rather than once in the job. The abrupt distinction between general and specific human capital cannot be directly used in the study of educational investment. At the time of educational choice, individuals are not well informed as to the identity of the firms they will meet. Human capital cannot be purely specific in the traditional sense: workers would have no chance of using such a kind of human capital, and, consequently, the whole investment would be spent in general human capital. We need a formal approach where human capital transferability between jobs and sectors varies in a more continuous way.

Our paper builds on Charlot et al. (2005). In this model, education jointly determines the scope and intensity of human capital. Such human capital is composed of two skills. Adaptability skills govern the fraction of jobs the worker can occupy, while productivity skills refer to worker's ability once in these jobs. Adaptability skills define the degree of human capital transferability across jobs. When adaptability skills expand, human capital becomes more general as it can be used in more firms. Conversely, when adaptability skills decline, human capital becomes more specialized.

In Charlot et al., the divide between investment in adaptability and in productivity is fixed. In this paper, we endogenize the mix of adaptability and productivity skills. Students allocate a fixed amount of investment between the two types of skills. The scope of one's human capital and its intensity evolve in opposite directions. Fig. 1 explains how this works. The different jobs are ranked on the horizontal axis according to a worker's perspective, from the most to the least preferred. The vertical axis indicates the worker's ability in such jobs. Human capital has two components: adaptability skills determine the  $x$  value, whereas productivity skills set the  $y$  value. The trade-off here means that increasing the  $x$  value (and so making human capital more transferrable) is detrimental to the  $y$  value (the worker is less productive in each job that s/he can actually occupy).

Our model highlights a key relationship between *match surplus* and the *return to adaptability skills*. Match surplus is the wealth associated with a job net of the worker's and the employer's outside options. This relationship drives all the results obtained subsequently. Adaptability skills improve the rate at which workers find jobs. Such skills, therefore, are set to capture match surplus. All the parameters that reduce match surplus also modify the optimal allocation of investment in favor of productivity skills.

In this perspective, Section 2 insists on the *Rosen* and *rent-capture effects*. The Rosen effect is named after Rosen (1983), who argues that the incentives to specialization are closely related to skill use: "the return to investment in a particular skill is increasing in its subsequent rate of utilization". In our framework, matching frictions increase match surplus and, therefore, the need to invest in skills that facilitate the capture of such a surplus. In the competitive environment – the limit case where frictions disappear – adaptability skills are useless because it is extremely easy to contact any type of job. Individuals, therefore, devote the main part of

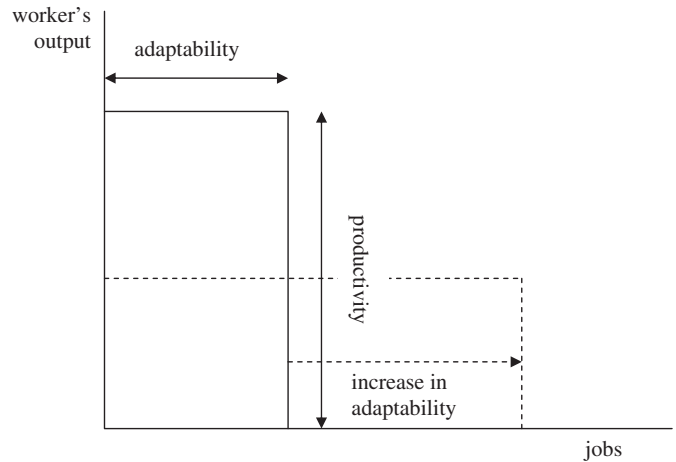


Fig. 1. When human capital becomes more general. The different jobs lie on the  $x$  axis, whereas the  $y$  axis displays the worker's output in each possible job.

their investment to productivity skills and so human capital is highly specialized. Conversely, specialized skills become less attractive when contacting an adequate job takes a lot of time.<sup>2</sup>

The rent-capture effect denotes the effect of workers' bargaining power. This parameter reduces match surplus and, therefore, promotes productivity skills rather than adaptability skills. Adaptability skills can increase outside options and this increases the bargained wage. Such skills become less advantageous when worker's bargaining power is very high.

Section 2 also examines macroeconomic implications. It introduces the main ingredients of a search equilibrium model: there is a matching function, vacant jobs need to be advertised at some cost, and the supply of jobs is determined through entry. The vacancy-to-unemployed equilibrium ratio increases with the contact surplus, e.g. the product of matching probability by match surplus. Workers' bargaining power has an ambiguous impact on the skill divide. The rent-capture effect lowers the returns to adaptability skills. However, employers post fewer jobs, which increases the severity of market frictions and so raises the returns to adaptability skills through the Rosen effect. Overall, the model predicts a non-monotonic relationship. The minimum of the curve is reached when the Hosios condition is satisfied.

We also show that individuals invest more in adaptability skills than they would do in the efficient allocation. The two allocations coincide in the case where the Hosios condition holds. Unlike standard models of human capital investment, the skill divide does not convey any externality. The reason is that individuals set the skill divide to maximize the contact surplus, e.g. the product of matching probability by match surplus, whereas firms make entry decisions on the basis of the same variable. When the Hosios condition is satisfied, increasing the share of investment spent in productivity skills above the individual choice deteriorates the contact surplus, and, therefore, reduces job creation.

In Section 3, we focus on each institution separately. We examine unemployment benefits (UB) and job protection. We show that both reduce expected match surplus and so distort the trade-off between adaptability and productivity skills towards productivity skills. In the case of UB, the replacement rate reduces match surplus for two reasons: it improves the well-being of the unemployed at given taxation; it also reduces the well-being of employees because payroll taxes must increase to finance the benefits.

In the case of job protection, we extend the basic model to account for endogenous job destruction. Job protection is a dismissal cost paid out of the employment relationship. We follow others and assume

<sup>1</sup> The variables are detailed in Appendix A.

<sup>2</sup> In a different setting, Gould et al. (2001) argue that unemployment creates educational incentives, because it originates a demand for precautionary education from risk averse individuals. Unlike Gould et al., individuals are risk neutral in our paper, and education can offer both general and specific skills.

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