



Employment protection and high-tech aversion

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Abstract

Do institutional firing costs slow the diffusion of information and communications technology (ICT)? The paper develops a model in which, as the technology at a given plant drops behind the best practice, it optimally reduces its workforce. As a result, firing costs are particularly detrimental to profits in industries in which the rate of technical change is rapid—such as ICT—and countries with high firing costs specialize in industries in which technical change is sluggish. The paper suggests that industry composition is a new channel through which labor market regulation might impact macroeconomic aggregates.

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1. Introduction

It is widely known that the prevalence of information and communications technologies (ICT) varies across countries. This phenomenon can be observed not only between “developed” and “developing” economies, but across industrialized countries also. For example, Pilat and Lee (2001) report that, among OECD economies, the number of personal computers (PCs) per 100 inhabitants in 1999 ranged from 65 in the United States down to 10 in Spain and Portugal.

This paper argues that a factor behind these differences in ICT diffusion could be differences across countries in *employment protection legislation* (EPL). Countries vary substantially in terms of EPL and, as discussed below, there is a strong correlation between the presence of these policies and the slow diffusion of ICT.

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The theory developed in this paper works as follows. Suppose that industries differ among each other in terms of the *rate of technical change*. In an industry in which technical change is rapid, plants will tend to fall behind the frontier technology faster than in industries in which technical change is slow. As a consequence, the optimal plant size will decline at a pace that is linked to the rate of technical change—indeed, Mitchell (2002) finds that cross-industry US data is consistent with such a link. This implies that a given job will be destroyed sooner in industries in which technical change is rapid: the effects of firing costs imposed by EPL should then be most severe in such industries. Several studies show that the rate of technical change does in fact vary significantly across industries—see Gordon (1990), Bartelsman and Gray (1996), Cummins and Violante (2002), and Wilson (2002). In particular, this rate appears to be most rapid in industries that employ ICT intensively—such as communications, computers and electronics. If the above intuition regarding the relationship between the rate of technical change and EPL is correct, it implies that, *ceteris paribus*, ICT should be less prevalent in countries in which dismissal costs are high.

The paper has two main contributions. First, although an extensive literature addresses the impact of EPL upon labor markets and aggregate income, the potential *cross-industry* effects of EPL have not been addressed. Second, the broader implication of the results is that the equilibrium industry composition constitutes a new and potentially important channel through which EPL and possibly other forms of regulation might affect macroeconomic aggregates.

Oliner and Sichel (2000) attribute a large part of the resurgence in US economic growth in the late 1990s to the diffusion of ICT, while Colecchia and Schreyer (2002) find that this phenomenon does not extend to all industrialized countries. This suggests that the observed differences in ICT diffusion may have significant macroeconomic consequences.¹ This paper finds that employment protection policies could be a factor behind these differences.

I conclude the introduction with some evidence of a link between EPL and the slow diffusion of ICT. Nicoletti et al. (2000) construct an index of EPL. The main components of the index are mandated severance pay and advance notice requirements, each of which can be shown to act as firing costs under simple assumptions—whence the attention devoted to them in the literature.²

Results are reported for four indicators of ICT diffusion. Some direct indicators are available, such as the number of personal computers per capita, and the share of ICT in aggregate spending. In addition, one use of ICT capital for which there are no direct substitutes is e-commerce: hence, the paper also uses the log number of internet hosts and the log number of secure servers relative to the population as measures of the prevalence of e-commerce infrastructure.³

Figure 1 reveals a striking negative relationship between EPL and measures of ICT diffusion. The correlations are all negative and significant, ranging from -60% for PCs and hosts to about

¹ There is an independent literature that addresses differences in access to and usage of ICT across households *within* a country, and the influence of ICT upon markets for different types of labor. On this, see for example Autor et al. (2003).

² See Addison and Teixeira (2003) for a survey. Also, see Gust and Marquez (2004) for further evidence of the link between EPL and ICT.

³ An internet host is any computer with full two-way access to the network, whereas a secure server is any computer that contains websites that may be accessed over the internet and which supports encryption.

Data are available for 20 OECD countries. An advantage of concentrating on industrialized economies is that it is not unreasonable to assume that they can draw from a similar set of technologies. The included countries are: Australia (AUS), Austria (AUT), Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the UK and the US. Sources: Coppel (2000) and Pilat and Lee (2001).

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