Journal of Comparative Economics xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

Journal of Comparative Economics

journal homepage: www.elsevier.com/locate/jce

Human capital, employment protection and growth in Europe

Maurizio Conti [a], Giovanni Sulis [b,c,*]

[a] University of Genova, Italy
[b] University of Cagliari, Italy
[c] CRENoS, Italy

ARTICLE INFO

Article history:
Received 14 April 2014
Revised 14 January 2015
Available online xxxx

JEL classification:
J24
J65
O47
O52

Keywords:
Employment protection legislation
Human capital
Technology adoption
Growth
Sectors

ABSTRACT

Conti, Maurizio, and Sulis, Giovanni—Human capital, employment protection and growth in Europe

Using data for a large sample of manufacturing and service sectors in 14 EU countries, this paper shows that the value added and TFP growth rate differential between high and low human capital intensive industries is greater in countries with low than countries with high levels of employment protection legislation. We also find that such negative effect of EPL is slightly stronger for countries near the technology frontier, in the manufacturing sector and after the 1990s. We interpret these results suggesting that technology adoption depends on the skill level of the workforce and on the capacity of firms to adjust employment as technology changes: therefore, firing costs have a stronger impact in sectors where technical change is more skill-biased and technology adoption more important. *Journal of Comparative Economics* **xxx** (xx) (2015) xxx–xxx. University of Genova, Italy; University of Cagliari, Italy; CRENoS, Italy.

1. Introduction

Do labour market institutions affect economic growth? If that is the case, which are the channels through which labour regulation affects growth? How important are labour market institutions for the adoption of new technologies? Are these effects differentiated across industries? In this paper we try to answer the above questions by looking at long/medium run quantitative effects of employment protection legislation (EPL) on growth of value added, hours of work and total factor productivity (TFP) across sectors in a set of European countries. We do this by investigating the heterogeneous effects on industry growth of the interaction between a country's level of EPL and a sectoral measure of technology adoption intensity.[1]

In a recent paper, Ciccone and Papaioannou (2009) introduce skill biased technical change into a two sector version of the Nelson and Phelps's (1966) model of technology adoption: convincingly, they show that countries with higher levels of schooling tend to specialise in sectors with higher human capital intensity. In fact, skill biased technical change – associated with the ICT revolution that has been taking place since the beginning of the 1980s – might result, under some conditions, in

* Corresponding author at: University of Cagliari, Italy.
E-mail addresses: mconti@economia.unige.it (M. Conti), gsulis@unica.it (G. Sulis).

[1] By technology adoption we mean the capacity to fully exploit the potential of recently developed technologies, and not simply imitate well established ones. Leading examples are automated machineries, information and communication technologies, flexible manufacturing systems, computer controlled machines whose productivity potential is fully exploited by highly skilled workers (Caselli, 1999).

http://dx.doi.org/10.1016/j.jce.2015.01.007
0147-5967/

relatively faster productivity growth in skill intensive sectors (see Caselli, 1999).[2] Hence, countries with higher human capital levels should be able to adopt the new technologies – such as automated machinery and information and communication technologies – faster and therefore experience relatively faster value added and employment growth in human capital intensive industries during the transition to the new steady state.[3]

However, the technology adoption process depends not only on the skill level of the workforce in a particular sector, but also upon the capacity of firms active in that sector to optimally adjust their employment levels as technology changes (Samaniego, 2006). If sectors experience different rates of technical change, firms operating in different sectors have heterogenous paths of adjustment of employment: in particular, the faster the rate of technical change, the higher the requirements for cutting or upgrading the workforce.[4] Hence, firing costs and labour market institutions as EPL may have a relatively stronger impact in those sectors in which technical change is faster as they reduce the expected returns on adopting new technologies.[5] In fact, for skill biased technical change at the world frontier to foster the specialisation in skill intensive sectors of countries with higher capacity of technology adoption, it is necessary that resources can be freely moved from low skill sectors to high skill ones. The existence of stringent EPL might slow down or even reduce this reallocation process, as recently noted, in the contest of a trade reform, by Kambourov (2009).[6]

During a period of strong skill biased technical change, EPL, by slowing down the adoption of the new technologies, might be more harmful for productivity growth in skill intensive sectors. This is because, as noted by Caselli (1999), these are the industries that "might plausibly be expected to be at the forefront of the technology revolution". Of course, an important assumption behind this result is that EPL tends to reduce the adoption of ICT technologies. Some favourable empirical evidence in this respect is offered in Fig. 1 for a panel of 15 countries observed in the period 1990–2000. The figure, as in Samaniego (2006), shows that personal computers adoption rates (proxied by the log of average computer per capita) tend to be higher in countries that, in the preceding five years, were characterised by lower degrees of EPL (see Gust and Marquez, 2004; Pierre and Scarpetta, 2006).[7]

By simply allowing technology adoption to also depend on employment protection legislation in a framework with skill biased technical change as the one proposed by Ciccone and Papaioannou (2009), we empirically show that EPL could negatively affect the specialisation pattern of countries by slowing down growth particularly in sectors with rapid technical change, such as human capital intensive sectors.[8] This channel is strictly related to the mechanism identified by Saint-Paul (1997a) to understand the effects of EPL on the pattern of international specialisation: in his theoretical framework, countries with higher levels of EPL tend to specialise in less innovative sectors to avoid additional firing costs that are more likely to arise in sectors characterised by more drastic innovation (see also Saint-Paul, 2002).

In order to study the relations discussed above, in this paper we first analyse the effects of employment protection legislation on growth of value added and hours of work in Europe using EUKLEMS data for 51 manufacturing and service sectors for 14 countries during the period 1970–2005. Moreover, because in our theoretical framework EPL affects value added growth through its effect on technical change in human capital intensive industries, we should also expect a negative relationship between EPL and the productivity growth differential between skill intensive and other industries. We therefore further extend our analysis on the growth effects of EPL by estimating various TFP growth regressions for the period 1990–2005 on a more aggregate sample of 24 sectors.

In our empirical framework we interact an indicator of EPL at the country level with a sectoral measure of human capital intensity which is invariant across countries (i.e., years of schooling in the workforce at the industry level) and is derived from US census data (as in Ciccone and Papaioannou, 2009). This methodology, first proposed by Rajan and Zingales

[2] In particular, these conditions refer to the sources of technical change and to the assumptions on the elasticity of substitution among skilled and unkilled labour in the production function.

[3] Such mechanism is also confirmed by abundant empirical evidence: see Autor et al. (2003), Machin and Van Reenen (1998), Caselli and Coleman (2001) and, more recently, Bartel et al. (2007) and Lewis (2011). For recent empirical evidence on the relationship between human capital and productivity growth at the industry level, see Mason et al. (2012).

[4] Michelacci and Lopez-Salido (2007) find that technological advances increase job destruction and job reallocation while Antelius and Lundberg (2003) offer some evidence that the rate of job turnover is higher in industries with higher shares of skilled workers; in turn, Givord and Maurin (2004) find that the job loss rate is higher in sectors with a higher share of R&D and high skilled workers.

[5] Various studies find a negative relationship between productivity growth and EPL. See, among others, Scarpetta and Tressel (2004), Bassanini et al. (2009), Autor et al. (2007), Micco and Pages (2007) and Cingano et al. (2010, forthcoming). By way of contrast, theoretical papers by Poschke (2009) and Lagos (2006) suggest the possibility of a positive impact of EPL on productivity, as empirically found for a panel of OECD countries by Belot et al. (2007). Moreover, see Bassanini et al. (2009); Cuñat and Melitz (2012) and Poschke (2010) for recent papers dealing with the effect of EPL on the specialisation pattern of countries. See also Cappellari et al. (2012) for a more comprehensive review of the literature on EPL and productivity, and Bertola (1994) and Hopenhayn and Rogerson (1993) for seminal papers on the aggregate effects of labour legislation on growth. Finally, Feldmann (2009) provides empirical evidence on the impact of labour regulation on unemployment.

[6] Acemoglu (2003) shows that regulations in the labour market, by compressing the wage distribution, might induce firms to invest more heavily in technologies that are complementary to low skilled workers. The increased productivity of low skilled labour could therefore reduce the relative importance of skill biased technical change for countries with heavily regulated labour markets, and this might again cause slower growth in human capital intensive sectors in countries with such labour markets (see also Koeniger and Leonardi, 2007).

[7] It should be noted that the negative and significant correlation between personal computer adoption rates and EPL reported in Fig. 1 is based on a regression where we have controlled for the log of per capita GDP, the log of the average number of schooling years in the population aged between 25 and 64, a time trend and a full set of country fixed effects. The coefficient of EPL in the regression is −0.35, with a p value of 0.07 and standard errors robust to arbitrary serial correlation within countries. The technology adoption data are taken from Comin and Hobijn (2010).

[8] In the working paper version of our paper, we sketch a very simple model of skill biased technical change, as the one proposed by Ciccone and Papaioannou (2009), in which we allow technology adoption to also depend on employment protection legislation.

Please cite this article in press as: Conti, M., Sulis, G. Human capital, employment protection and growth in Europe. Journal of Comparative Economics (2015), http://dx.doi.org/10.1016/j.jce.2015.01.007