



# University invention and the abolishment of the professor's privilege in Finland

Olof Ejermo<sup>a,b,\*</sup>, Hannes Toivanen<sup>c</sup>

<sup>a</sup> Department of Economic History, School of Economics and Management, Lund University, P.O. Box 7083, SE-22007 Lund, Sweden

<sup>b</sup> CIRCLE, P.O. Box 117, SE-22100 Lund, Sweden

<sup>c</sup> Pasilanraittio 5, 00240 Helsinki, Finland

## ARTICLE INFO

### JEL classification:

I23  
I28  
O31  
O32  
O34  
O38

### Keywords:

Academic patenting  
Finland  
Professor's privilege  
University ownership

## ABSTRACT

In 2007 Finland changed ownership rights to inventions from its employees – “the professor's privilege” – to universities. We investigate how this change affected academic patenting using new data on inventors and patenting in Finland for the period 1995–2010. Matched sample panel data regressions using difference-in-differences show that patenting by individuals dropped by at least 29 percent after 2007. Unlike other countries studied, in Finland the reform was known before implementation. Adding the period after announcement to the reform period increases the drop in academic patenting to 46 percent. Our and others' results call into question whether the European reform of the professor's privilege were good innovation policy.

## 1. Introduction

In 2007, Finland joined other European countries in a trend to switch ownership rights over inventions such that public universities now own the rights to inventions produced by researchers there. This revoked ownership rights previously held by academic employees, commonly referred to as the “professor's privilege.” Theory highlights two main opposing forces when ownership rights change from the individual to the university. First, patenting may become easier for researchers because of more easily accessible university transfer assistance, which could speed up patenting. Second, through owning patenting rights, universities can tax patent incomes, reducing monetary incentives for researchers to invent.

We investigate the effects of the abolishment of the professor's privilege in Finland. Our investigation utilizes novel data on Finnish inventors collected for this paper, linked to individual employer–employee data in collaboration with Statistics Finland. We examine changes in inventive outcomes for academic researchers, contrasting these changes with those in control groups from institutes and firms, respectively, in difference-in-differences regressions. We rely mainly on matched samples based on coarsened exact matching (CEM) at the individual level.

The paper contributes to the existing literature in several ways. Very few papers in this area of research utilize economy-wide data on inventors. Access to good data allows us to control for demographic composition, education and individual (innate) propensities to patent through fixed effects. Importantly, it also allows the exploitation of the experimental nature of the policy reform through the creation of an appropriate control group against which to compare the effects on academic inventors. This allows the identification of a plausibly causal effect of the policy reform. Although several well-established micro-econometric techniques allow the identification of causal relationships, such as instrumental variables, regression discontinuity and differences-in-differences (DiD; see, e.g., Angrist and Pischke, 2009), our paper is only one of three that attempts to causally identify an effect, all applying a DiD approach (Czarnitzki et al., 2015; Hvide and Jones, 2016). The DiD setup enables us to study changes in patenting in academia, which is contrasted with developments at institutes and in the private sector. This gives us the ability to “net out” contributions to the groups studied that, although time varying, are common over time. For instance, technological progress or business cycles can lead to swings in patenting that are common to all three groups. Not controlling for such trends would confound policy reform effects with other trend effects

\* Corresponding author at: Department of Economic History, School of Economics and Management, Lund University, P.O. Box 7083, SE-22007 Lund, Sweden.

E-mail addresses: [olof.ejermo@ekh.lu.se](mailto:olof.ejermo@ekh.lu.se) (O. Ejermo), [hannes.toivanen@teqmine.com](mailto:hannes.toivanen@teqmine.com) (H. Toivanen).

URLS: <http://staff.circle.lu.se/olof.ejermo/> (O. Ejermo), <http://www.teqmine.com> (H. Toivanen).

that distort interpretation. This paper therefore helps us understand whether the consequences of changing the IP-patenting regime has effects consistent with the other studies, but in a quite different setting. It is highly policy relevant if we can establish that the results of this major and much debated European reform led to similar outcomes across different countries, each with its own unique combination of institutional features.

We find that the case of Finland differs in many ways from other cases studied. In Finland, the IP-regime change took place in the midst of a major restructuring of the telecom sector. It also took place just before the start of the recession in 2007, which means that the post-reform period could be affected by slower economic development. Another important difference is that our study reveals pre-reform effects in Finland that seem to have influenced academic patenting behavior even before implementation, but after announcement of the reform.

The analysis shows the importance of taking structural factors into account. Our most reliable analyses use the private sector as the main control group. We also omit the firm with the most patenting to remove trend effects in the control group. The results indicate an adverse effect on university patenting. Contrary to the expectation that the reform would stimulate patenting, we observe a 29 percent drop in university researcher patenting in our matched sample analysis. In addition, by including the period before the reform but after the announcement of it, our preferred specification, the drop increases to 46 percent.

We thus show how the DiD framework can be adapted to deal with circumstances that deviate from the standard DiD setup in an evaluation of academic IP-regime change. In robustness analyses, we delve into the sensitivity of our results by examining two potentially mitigating or reinforcing factors of the Finnish IP-reform. Government funds were raised substantially in order to stimulate commercialization of research and technology transfer after the reform. Although imprecisely measured, as TULI funds can be observed only as part of other government funds from Tekes, the Finnish Funding Agency for Innovation and Technology, our analysis of universities that had large increases in Tekes funds after 2007 experienced no statistically different effect on patenting from other universities in terms of patenting. We also analyze whether academic inventors who moved out of academia could be responsible for the decline but find that this is most likely not the reason. Our and others' results call into question whether the European reform of the professor's privilege were good innovation policy. Our findings also add to existing evidence that any potentially positive effects from increased tech transfer support does not outweigh the downside of eliminating the professor's privilege.

## 2. Literature review

In much of Europe, until the early 2000s default ownership of inventions by university researchers rested with the individual. The inspiration for the change in Europe in ownership to that of universities came from the United States, which in 1980 through the Bayh–Dole Act set the default rights of invention ownership from federally funded research at the university level (Mowery et al., 2001). It should be noted that the European and American starting points were different, however. The US reform involved a decentralization of ownership, whereas later European reforms implied centralization (Von Proff et al., 2012). A sharp rise in university patenting was observed at American universities in the 1980s and 1990s (Trajtenberg et al., 1997). But it has never been established whether this was due to (a) the reform, (b) other reforms that strengthened patent rights around the same time, (c) increased patentability in, for example, biotech, or (d) a rising rate of academic patenting that had begun already in the 1970s (Mowery et al., 2001). On balance, it seems likely that this decentralization may have helped create better incentives for individual researchers, because the Bayh–Dole Act implied that technology transfer offices were established at many American universities (Audretsch and Göktepe-Hultén, 2015;

Coupé, 2003). However, the case for switching from the individual level to university ownership in Europe was less clear-cut. Theoretically, the effects of changing from the individual level to university ownership centers on arguments that university administrations offer efficiency gains. This stems from the assumption that researchers are less capable of finding suitable industry partners than are their technology transfer officers (Verspagen, 2006). The downside to university ownership, however, is higher (transaction) costs, which “tax” university inventors. A common distribution seems to be one in which, net of university costs, one-third of the profits go to the inventor and two-thirds to the university, as in Germany and Norway (cited below as HJ Hvide and Jones, 2016).

Lowe (2006) highlights some of the trade-offs in a theoretical model. He analyzes the technology transfer process in situations in which the development of an invention requires active tacit knowledge transfer from the inventor. This assumption is realistic, as many observers have concluded that inventions are rarely ready for commercialization “off the shelf” but, rather, need the active assistance of the originator (the researcher) to be developed (Jensen and Thursby, 2001; Zucker et al., 1998). In the model by Lowe (2006), in cases in which a sufficiently high level of tacit knowledge is required, inventors prefer to start their own firm, through which they develop their invention to the point that it is ready for commercialization. This is because tacit effort requires compensation to the inventor in the form of royalties that lower profit and reduce output (given that demand for inventor knowledge is elastic). As in the discussion in the literature, Lowe (2006) stresses three roles through which universities can help inventors. First, they spread fixed costs associated with administration, licensing, and other intellectual property costs across many commercializable inventions. Second, they function as intermediaries bringing licensees together with inventors. That is, they find actors ready to commercialize results that inventors might otherwise not find. Finally, universities may be better negotiators than individual inventors. The trade-offs in costs and gains are thus between those who do not need the assistance of universities, which mainly face losses in the form of “university taxation,” vs. otherwise noncommercialized inventions for which inventors may now find an actor willing to commercialize them. It can easily be perceived that the first cost could discourage researchers from inventing (Lowe, 2006; Thursby et al., 2009).

The net contribution by universities is therefore not obvious and may vary from invention to invention. It is determined in part by the skills of the technology transfer office. Theoretically, individuals without patenting experience could gain from advice that universities can offer. However, the willingness to contribute to an invention could decline for inventors with established firm networks (cited below as CZ Czarnitzki et al., 2015). These theoretical intricacies did not stop European countries from adopting university ownership rights, disregarding the need for a sound empirical basis. In the recent wave, Denmark went first in 2001, closely followed by Germany and Austria (2002), Norway (2005), and Finland (2007).<sup>1</sup> Lissoni et al. (2009) investigate the case of Denmark, but the lack of data on individuals before the reform limits the ability to understand its effects, although it is clear that university ownership of academic patents increased at the expense of patents invented by academic researchers but applied for directly by commercial firms, as expected. In Italy, national legislation decreed a switch from university ownership to individual ownership. However, this reform was largely circumvented by local university regulations that effectively reversed the legislation and reinforced university ownership (Lissoni, 2013; Lissoni et al., 2009). Some cases have been

<sup>1</sup> The French innovation act of 1999, examined by Della Malva et al. (2013), does not clearly fall into a distinct ownership change. Tax incentives to establish technology transfer offices and an institutional recognition of technology transfer activities sought to stimulate universities to become more active partners in commercialization of intellectual property. The authors indeed find evidence of an increased share of ownership of French universities involving university researchers.

Download English Version:

<https://daneshyari.com/en/article/7384488>

Download Persian Version:

<https://daneshyari.com/article/7384488>

[Daneshyari.com](https://daneshyari.com)