No. 6 | July 2013

ZEW policy brief

Diana Heger (ZEW), Paul Jensen (Melbourne University and IPRIA), Elizabeth Webster (Melbourne University and IPRIA), Alexandra Zaby (University of Tübingen)

The Research Use Exemption from Patent Infringement – Boon or Bane?

SEEK

Essential Issues

Research Question and Relevance

A research use exemption enables companies or research institutions to apply patented know-how of third parties for research purposes for free without being sued for hurting patent rights. Depending on the extent of its implementation, the research use exemption may be positive or negative for stimulating innovation.

The main task of patent policy is to find the right balance that fosters technological progress by contributing to the diffusion of newly generated knowledge while providing sufficient incentives to patent inventions. To disentangle these effects of research use exemption, we analyse two research questions:

(a) Can a research use exemption contribute to technological progress by fostering firms' R&D activities?

(b) Does the extent of a research use exemption have an impact on firms' propensity to patent?

Methods and Database

In order to answer these questions, we first model varying degrees of research use exemption in a setting of cumulative innovations. One innovation is based on a previous (pioneer) invention, which is either patented or kept secret. In a second step, we look for empirical evidence confirming our predictions using data generated by an online survey conducted in Germany and Australia.

Key Findings

In the theoretical model, the protection mechanism (patenting or secrecy) selected by the pioneer inventor determines who is more likely to achieve the follow-up invention. In case of patenting, whether the follow-up inventor infringes on the patent rights by using the patented knowledge as input to his research depends on the extent of the implemented research use exemption. We find that a stronger research use exemption leads to a lower propensity to patent even if it fosters firms' overall R&D activities. The empirical investigation identifies a positive relation between the firms' belief about the implemented research use exemption and its propensity to patent. This suggests that the negative effect of the research use exemption on patenting may be offset by its positive effect on overall R&D activities.

Key Findings

Opposing Effects of Research Use Exemption (RUE)

Patenting an invention does not only entail the protection of a new idea but also involves the disclosure of knowledge that could benefit competitors. The publication of patents spurs the diffusion of newly generated knowledge (one of the major functions of a patent system). If we are to take this diffusion function seriously, the use of the patented knowledge would be permitted in different (but related) areas. A research use exemption strengthens the (negative) disclosure effect of a patent and at the same time weakens its (positive) protective effect (since it legalises the research use of patented knowledge by competitors in another research process). Yet the resulting product must still be non-infringing with regard to the protected product.

Optimal Patent Policy

Our theoretical model shows that a strong research use exemption constrains a firm's incentive to patent newly generated knowledge, but increases the overall R&D efforts (as patented knowledge can legally be used by competitors). Our empirical results may serve as an initial indication that the positive effects of a research use exemption may outweigh its negative effects. In sum, the optimal patent policy keeps in mind both effects when introducing or strengthening the research use exemption and needs to find a well-balanced definition of a research use exemption that spurs technological progress while creating incentives to patent.

Research Question and Relevance

How Do Different RUE Designs Influence R&D and Patenting?

Using information that is incorporated in a competitor's patent is illegal without agreement on its use, and the mere imitation of a patented product can be prosecuted by law. Yet if the use of all patented knowledge was illegal, technological progress would be impeded, as subsequent inventions could not be based on the newly generated knowledge. The research use exemption protects patented knowledge used in competitor's research against the claim of infringement.

Research use exemptions may have positive and negative effects, depending on their scope. One criticism against a narrow implementation is that it may hinder technological progress by impeding competitor access to patented knowledge or forcing competitors to re-direct their research investments to other (research) projects. A broad definition may result in an inventor's reluctance to patent, as successful pioneer innovators anticipate the use of their patented knowledge as input, making follow-up inventions easier. On the other hand, a broad implementation may exert a positive effect on the pace of technological progress, as mentioned before. Thus, the optimal patent policy must find a way to balance both effects, implementing a research use exemption that fosters technological progress and while maintaining firms' propensity to patent.

Although most countries have implemented a research use exemption in their patent system, its extent depends on the specific legal system and is often only implicitly defined, particularly in countries ruled by case law. In this study, we look at the impact of different designs of research use exemptions on firms' R&D activities and on inventors' propensity to patent. In our theoretical model we focus on gradual changes in the scope of the research use exemption. In our empirical analysis we look specifically at two countries: Germany (statutory implementation of research use exemption) and Australia (a case law system). In the latter, the introduction of a broad codified research use exemption has been discussed since 2004 (see the box for the differences between the two systems).

Box 1: The implemented research use exemption in Australia and Germany

Australia	Germany
• Case law in Australia up until 2012, but uncertainty regarding the nature and extent of any research exemption	• Statutory research use exemption (codified in German patent law (PatG)):
• The case law on the existence of an experimental research use exemption in Australia dates back to a 19th century case in England: Frearson v Loe 9 ChD 48. English case law, while not binding, is strongly persuasive.	• § 11 PatG exempts all non-commercial research and trial activities as well as research on patented subjects from patent infringement. Research with the patented matter remains an infringing action.
• In 2011, a new bill was introduced into the Australian Parliament: The Intellectual Property Laws Amendment (Raising the Bar) Bill 2011. The Bill passed its third reading in the House of Representatives on 20 March 2012. It received Royal Assent and became law on 15 April 2012 (it has become effectual on 15 April 2013).	• § 11 PatG was extended by Federal Supreme Court's decisions "Clinical Trials I" and "Clinical Trials II", which exempts research with patented compounds for equivalency tests etc. for the admission procedures before the end of the grant period (equivalent to the Bolar exemption in the United States)

Source: ZEW

Methods and Database

Theoretical Model and Empirical Test

We use two approaches to answer the research questions: theoretical modelling and empirical analysis. In looking at the positive und the negative impact of research use exemptions individually, we develop a theoretical model. In this model, subsequent innovation is based on the first, and the likelihood of achieving the second innovation depends on the first inventor's protection strategy. The first inventor creates a technological head-start for achieving the second invention. If he chooses secrecy, he cannot market the first invention, provided he wants to keep his head-start. If he chooses patenting, he will lose (some of) his head-start on account of the disclosure requirement; but he will be free to market his first invention and generate profits. Furthermore, if a competitor produces a follow-up invention, the first inventor may receive compensation if he successfully challenges the research use exemption in court and a fine is imposed on the competitor.

We distinguish two types of infringement: output infringement and input infringement. It is usually assumed that patent infringement takes place on the product market. We refer to this as output infringement. In the absence of a research use exemption, another kind of infringement may occur: The use of patented knowledge by rival firms during their research process. We call this type of infringement input infringement. Our analysis focuses on the latter infringement and rules out the occurrence of the former, i.e. if a rival firm is able to achieve the second innovation it does not infringe on the patent of the first innovation. We claim that the strength of the research use exemption depends on two factors: the legal certainty that an input-infringement will not be prosecuted and the enhancement of technology diffusion. This model allows us to analyse different scopes of the research use exemption and to distinguish case law and the statutory research use exemption as special cases. Finally, we assess a number of predictions empirically. For this empirical test, we surveyed firms in Germany and Australia. Some 200 firms participated.

Research Results

Theoretical Predictions

The main finding from our theoretical model is that strengthening the research use exemption, i.e. increasing the reliability of the research use exemption and lowering the fine associated with

an input infringement, increases aggregate R&D investment. If the technology diffusion is sufficiently high, then overall R&D expenditures are higher in a regime with complete legal certainty about the research use exemption (as is the case in Germany). But at the same time, strengthening the research use exemption decreases early inventors' propensity to patent.

Empirical Results

In the empirical investigation we analyse whether the theoretical predictions hold true by using the results of an online survey. As the scope of a research use exemption is the same for every firm within a given country, and as firms base their decisions on perceptions of the legal and competitive environment, we inquired into company beliefs about the implemented research use exemption. It turns out that the beliefs of many innovative German firms do not correspond to the actual legal research use exemption implemented by German patent law. Indeed, beliefs about the research use exemption have a positive effect on firms' propensities to patent a specific invention. At first sight, this contradicts our theoretical predictions. One reason for this is the restrictive design of our model, which fails to consider whether the second inventor chooses to patent. An extended model would most likely indicate that the research use exemption had a positive effect on second inventors' propensity to patent. As freely available knowledge spurs technological progress, second inventors would produce more innovations and thus patent more. Our empirical findings indicate that this positive effect is stronger for second inventors than the negative effect is for first inventors. In the theoretical model we assume that the knowledge-user will always benefit from a broad research use exemption, while the knowledge-provider will prefer a narrow research use exemption. But this ignores the fact that a knowledge-user becomes a knowledge-provider as soon as he patents his follow-up innovation. The change of perspective would ultimately change his assessment of the research use exemption.

Project Profile

Researchers

- **Diana Heger,** ZEW
- **Paul Jensen,** Melbourne University and IPRIA
- **Elizabeth Webster,** Melbourne University and IPRIA
- **Alexandra Zaby,** University of Tübingen

Contact

Department of Industrial Economics and International Management, Centre for European Economic Research (ZEW), L 7, 1, 68161 Mannheim, Germany, phone: +49-621-1235-194 or -197, e-mail: halder@zew.de/foerster@zew.de

Funding

The research progamme "Strengthening Efficiency and Competitiveness in the European Knowledge Economies (SEEK)" is funded by the German state of Baden-Württemberg.

Duration

1 October 2010 – 31 March 2012

Publications

Diana Heger and **Alexandra K. Zaby** (2013). The heterogeneous costs of disclosure and the propensity to patent. Oxford Economic Papers 65 (3), 630-652

ZEW
Zentrum für Europäische Wirtschaftsforschung GmbH
Centre for European Economic Research

ZEW policy brief series

Publisher: Centre for European Economic Research (ZEW), Mannheim
L 7, 1 · 68161 Mannheim · P.O. Box 10 34 43 · 68034 Mannheim · Germany · Internet: www.zew.de · www.zew.eu
President: Prof. Dr. Clemens Fuest · Director of Business and Administration: Thomas Kohl

Editorial responsibility: Prof. Dr. Clemens Fuest