Regulation, Competition and Innovation: A New Empirical Evidence

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Abstract This paper analyzes the effect of different forms of regulations on innovation in OECD countries. The regulations under study included competition policy, intellectual property rights, foreign direct investment restrictions, public sector transparency, and labor market regulations. It is found that innovation increases with stronger competition policy, stronger intellectual property rights, weaker foreign direct investment restrictions, higher public sector transparency, and weaker labor market regulations. Moreover, competition policy and intellectual property rights are found to be complements.

Keywords: Competition Policy, Regulation, Innovation, R&D, Intellectual Property Rights, OECD Countries

JEL Codes: L40, L51, O30

Introduction
Understanding the interaction between regulation and innovation is crucial to determine the appropriate policies that foster R&D and long term growth. Government regulations directly affecting firms encompass competition policy, intellectual property rights, licensing regulations, health and safety standards, environmental regulations, to name only a few. Whether such regulations encourage or hinder innovation is an open question. For example, Bassanini and Ernst (2002) show that for OECD countries, competition and intellectual property rights encourage innovation, while the effect of job protection is ambiguous. Aghion et al. (2005) find that competition first increases then decreases innovation. Stewart (2010) finds that in the U.S. economic regulations and policy uncertainty reduce innovation. Strobel and Kratzer (2017) find that government bureaucracy reduces innovation by German SMEs. Of particular importance for innovation are intellectual property rights and competition policy. A legitimate question is whether the two policies are complements or substitutes. If they are deemed complements, this would call for strong intellectual property rights and strict competition policy. If, on the other hand, they are considered substitutes, then optimal policy would call for either a) strong intellectual property rights and weak competition policy; or b) weak intellectual property rights and strong competition policy. Furthermore, intellectual property rights are subject to international coordination and agreements, which is much less the case for competition policy. In this paper we wish to study how different regulatory variables affect innovation, focusing on OECD countries. We use data for 34 OECD countries for the period 2008-2015. The regulatory variables used include competition policy, intellectual property rights, restrictions on foreign direct investment, public sector transparency, and labor market regulations. The hypotheses
we will be testing include: positive association between competition policy and R&D; positive association between intellectual property rights and R&D; positive association between public sector transparency and R&D; negative association between foreign direct investment restrictions and R&D; negative association between labor market restrictions and R&D; positive association between economy size and R&D; positive association between human capital and R&D; positive association between predominance of high-tech sectors and R&D. This paper contributes to the literature by studying explicitly the effect of different types of regulations for OECD countries. Instead of treating government regulation as a whole, we distinguish between different types of regulations, since some regulations may increase innovation, while others may decrease it. Moreover, we study explicitly the interaction between two particularly important regulatory variables, namely, intellectual property rights and competition policy, to determine not only their individual effects, but also whether they are complements or substitutes. The paper is organised as follows. The next section presents the previous studies and empirical specification. The data is presented and discussed in section 3. Empirical findings are given in section 4. Section 5 concludes the paper.

Previous literature

Previous studies on the interaction between regulation and innovation do not give a unanimous answer as to what is the effect of regulation on innovation. The answer may depend on the type of regulation, but also on the type of innovation being considered. Consider first competition policy. Initial strengthening of competition policy may foster innovation, but further strengthening may reduce rents so much as to reduce innovation (Aghion et al., 2005). On the other hand, in British industry, Geroski (1991) finds a positive relationship between competition and innovation. Thus, the literature has not reached a clear verdict on the effect of competition and competition policy on innovation. Labor market regulations a priori have an ambiguous effect on innovation (Blind, 2012). The higher job safety and protection associated with stricter labor regulations may increase the incentives of workers to innovate. On the other hand, stricter labor regulations may increase labor costs and adjustments costs for firms (in case of failure or need to reduce labor inputs), reducing the incentives of firms to innovate. Barbosa and Faria (2011) find that labor market flexibility increases R&D intensity in their study of EU countries. Bassanini and Ernst (2002) study the impact of labor regulations on innovation in 18 OECD countries. They find that labor market flexibility is associated with higher levels of innovation in low-tech industries, and for all industries in countries with decentralized wage bargaining. However, in countries with centralized industrial relations, labor market flexibility reduces innovation. Intellectual property rights may increase innovation incentives by increasing the rents from innovation, but may also reduce overall innovation by reducing diffusion. Studying software patents in the U.S., Bessen and Hunt (2007) find that they have a negative effect on innovation. Lerner (2009), who takes a long-term view (150 years), reaches a similar conclusion. Williams (2013) finds that patenting by the private firm Celera (Human Genome) reduced subsequent innovations by 20-30 percent. However, several studies find positive effects of IPR on innovation. Dutta and Sharma (2008) find that the TRIPs agreement (by which intellectual property rights were strengthened) increased innovation by Indian firms. Campi (2016) studies the effect of intellectual property rights on agricultural productivity. He finds positive effects for low and high income countries, but no significant effects for middle income countries. Overall, the literature on the effects of intellectual property rights has not reached a consensus view.
Empirical Findings
Table (1) presents the results of dynamic panel data regression (Equation 6.2) for 34 OECD countries (N=34) during the period 2007-2015 (T=9).
Table (2) Robustness check, OECD countries, System GMM Model; values in parentheses are p-values.

Conclusion and policy implications
This paper has analyzed the effects of different types of regulations on innovation in OECD countries. It has been found that firms innovate more when competition policy is stricter, when intellectual property rights are stronger, when labor markets are more flexible, when there are less restrictions on foreign direct investment, when governments are more efficient and transparent, when human capital is higher, when the economy is larger, and when countries are less dependent on natural resources. Moreover, we have found that competition policy and intellectual property rights are complements, in that each of these policies reinforces the effect of the other. This means that governments who have already adopted a tough competition policy, but are yet to strengthen their intellectual property rights, have a lot to gain from making such a change. Similarly, countries which have adopted strong intellectual property rights (through TRIPS, for example), but have yet to modernize and strengthen their competition policy, have every reason to do so. As discussed in the paper, there is some ambiguity in the literature regarding the effects of some regulations on innovation. The literature is ambiguous about the effect of competition on innovation. However, our results provide strong support for a strict competition policy. The recent work of Kwoka (2014) finds that in most countries competition policy has been too soft, causing harm to consumers through market power-increasing mergers (with dubious efficiency gains claims) which should not have been allowed. Similarly, the literature is inconclusive about the effect of intellectual property rights on innovation. Here too, our paper provides a clear positive relationship between protecting innovators’ rights and innovation investments. The positive incentive effects seem to outweigh the negative diffusion effects. Finally, the literature is inconclusive regarding the effect of labor market regulations on innovation. Here too, at least in OECD countries, the benefits of flexibility outweigh the benefits of safety and stability of employment. The results of this paper are in the same spirit as the results of the paper by Elmawazini et al. (2016). That paper studied the same issues as those studied here, but for Middle Eastern countries. The results for OECD countries and Middle Eastern ones are qualitatively similar: factors that foster innovation in industrialized OECD countries are the same factors that foster innovation in less advanced, more resource based, Middle Eastern countries. This suggests that the basic economic rationale for these effects is strong, and is not dependent on the level of development or the level of resource dependence. Hence, at least when it comes to fostering innovation, policies which are optimal for industrialized countries are also appropriate for middle income ones. Some factors are outside government control, like the size of the economy. However, other variables can be affected by government policies, such as competition policy and restrictions on foreign direct investment. The results of this paper give clear indications to governments about the policies to adopt to foster innovation. Some interest groups (incumbent firms, government bureaucrats) may oppose those policies, since they threaten their established rents. However, governments need to overcome this opposition, and adopt policies that foster innovation and long term growth, which benefit society as a whole.

References


