The main objective of the patent system is to provide rewards for socially beneficial innovations (Gilbert and Shapiro (1990)). Patents are traditionally regarded as necessary evils: the system is costly, granting what is often perceived as excessive market power as a reward to innovation, but, given the asymmetries of information involved, i.e. the fact that beforehand it is very hard to elicit the information over which innovations are truly valuable, they are still seen as the best way of providing the right incentives for research and development. Other factors come into play as forces pushing away from the social optimum; as the design of patent systems does not account for differences in industries and its one-size-fits-all may distort firms R&D effort to favor products with a short time between patenting and commercialization or lead to strategic choice of R&D by firms in order to explore patents as a way to create barriers to entry. It’s a common claim that the lower the quality of patents issued (e.g., when patents that cover already existing technologies or obvious ones), the less efficient is the patent system at stimulating innovation. Complaints about patent quality are not new and seem to be increasing in recent years. With a consistent rise in the number of patents being granted, these problems are likely to be intensified. This research project aims at investigating how these effects interact in markets where several patents are required in order to produce a single product, filling the gap between the literature streams on optimal patent duration, patenting and anti-trust, and patent pools and standard setting.

Several specific characteristics of these markets for complex products have not been taken into consideration in the literature on patents and standards such as the fact that the firms may be competitors, so that the assumption of existence of unequivocal gains from trade between the patent holder and the firm who might be, eventually, in breach of patent (as in Shapiro 2010, among others) may not correspond. Another particularity that might affect results and that should be taken into account are the common strong network externalities and the often associated switching costs: not only users enjoy the ease of integration gained by the sharing of a single platform but they also provide significant feedback about flaws encountered and directions for improvements, while taking time to learn how to experience fully the product. The existence of dedicated applications and complementary products that involve costly investments from third parties intensifies this effect and point to an increase in the barriers to entry as time passes and the incumbent is able to build a larger consumer base. Both these effects work in the direction of eliminating gains from licensing, as what is initially a small lead to one competitor may result in turning the market fully in its favor. As documented by Schwartz and Takhteyev (2009) in their analysis of open source software, another important consideration not explored in the literature is the hold-up problem that exists for sophisticated goods. When products require the licensing of previous innovations in order to function, after costly investment to design a product compatible with the licensed technology, the licensor has an increase in its bargaining power and can negotiate a larger share of profits ex-post. This also works in the direction of limiting incentives to licensing but also hampers innovation when it occurs sequentially (i.e. one innovation builds on a previous one). The aim of this research project is to study the impact of the choice of both patent length and breadth on the dynamics of R&D investment given the interplay of network externalities and switching costs in markets with sequential innovation, where firms need several patents in order to bring a product to the market. It’s expected from such analysis more robust results on the optimality of intellectual property protection in markets for high technology products.

The PhD student will present his research in the international conferences of the field (in industrial organization and economics of innovation and intellectual property).