

Running royalty and patent citations: the role of measurement cost in unilateral patent licensing

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Abstract

This paper empirically examines and interprets how royalty is structured by combining the fixed royalty component and the running royalty component, utilizing the U.S.-Japan patent licensing data. Risk sharing theory predicts that the increase of risk (implied by more forward citations to a licensed patent) will favor the use of running royalty rather than simple fixed royalty to share the risk. The principal and agent framework predicts that, if a licensee has greater scope of entrepreneurial effort (as well as of moral hazard) than a licensor, it will favor fixed royalty. The same framework also predicts that, if a licensor has a margin of moral hazard, it will favor running royalty. Thus, as long as transaction cost (TC) is neglected, theoretical predictions critically depend on the ad hoc assumptions of risk aversion, the scope of entrepreneurial effort, and of moral hazard. Instead of this TC-free argument, this paper follows prior studies in agriculture and in movie film, which recognize the importance of measurement cost. While running royalty is computed from royalty base, i.e., sales of final products, a patent with larger number of citing patents has a more diversified royalty base, which is more costly to specify and measure. As the scope of the royalty base becomes more complex, it is more costly to determine whether or not those products based on citing patents infringe the originating patent. Thus, running royalty is expected to incur more costs to measure royalty base, as the number of citing patents increase. The efficiency gain from share contracting will be eventually overridden by the increase in measurement cost. The empirical evidence indeed shows that running royalty is less frequently used when there are more citing patents (forward citations) to licensed patents. The finding is consistent with the interpretation that measurement cost matters in share contracts of technology licensing.