Comparative Study on the Patent Maintenance Fees Systems of High Income Countries in Europe

Yong-zhong QIAO and Jia-jia GAO*

Intellectual Property Research Institute, Xiamen University, Xiamen, Fujian, China
*Corresponding author

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Abstract. The aim of this paper is to study on the incentive mechanism of the patent maintenance fees system using charts analysis on the patent data for 23 countries in Europe. Our findings show the most countries begin to pay maintenance fees from the third to sixth year after the filing date of the application. The charging standard with an overall growing trend is more reasonable. In contrast, the incomplete year-on-year growth model with the same amount during a few years is theoretically more advantageous, and four countries of five highest income countries in Europe implement it.

Introduction

Patents, as a form of IP protection, constitute a mechanism that aims to facilitate innovation and the commercialization of technologies. [1] An effective system can improve the predictability of economic activities, promote the material capital and human capital investment, thereby contributing to economic growth. A large number of literatures support the conclusion from the view of empirical. Knack and Keeler (1995) and Hall and Jones (1999) proved the positive correlation between property rights system and economic growth. [2,3] Rodrik (2000) found an effective system can ensure that the private rate of return by personal economical effort is close to the public rate of return, then increasing the effort degree of production activity, thus improve productivity efficiency. [4] Acemoglu et al (2003) studied on the causal relationship between system and economic growth, proved that the higher the institutional quality is, the higher the average income is, the higher the economic growth rate is. [5] Then the high-income country's patent system with a higher quality can be proved from the opposite angle.

The incentive effect of patent system on the technological innovation and the economic growth will be impacted directly by the adaptation degree of the patent maintenance fees system to the legal and economic system at a certain stage. [6] Patents evolved as a way for an inventor to deny others the right to take advantage of their invention, by denying them the right to manufacture the invention or to license it. [7] And the patent maintenance fee is a must payment for the patent owner in order to maintain the validity of the patent, and it shall be paid to the Administrative Department in accordance with the stipulated time and amount, however, due to the differences in the legal system, the economic development and so on, the patent maintenance fees systems are diversified among countries. Harhoff et al (1999) and Thomas et al (1999) showed that the patent maintenance fees charging information usually is influenced by the value of patent index such as patent citation index, the claim number and the nationality of the patent owner [8,9]. Scotchmer et al showed according to the patent licensing system, patent transaction market rules, price formation mechanism and so on, the patent maintenance fees charging information can verify that these factors are systematically affecting the value of patent protection. [10] Kyriakos et al (2016) studied the transfer of technology according to the patent maintenance fees information of "academic" patents authorized by American universities and institutes. Regionally, the existing researches on the patent maintenance fees system in Europe and the United States are much more. The patent maintenance fees system in EU takes the incomplete year-on-year growth model with the same amount during a few years (European Patent Office implements the incomplete year-on-year growth model with the same amount during a few years, in
which the patent owner must pay maintenance fee yearly, after the tenth year the amount remains the same, while in the other years, it gradually increases.) which fits to some of the arguments put forward by the economic literature on maintenance fees, and follows an exponential trend to ensure an effective endogenous correction mechanism. Thus, studying the patent maintenance fees in 23 high income countries in Europe is helpful to grip the incentive mechanism.

Studying the regional patent maintenance fees system is of great value to promote the improvement of the patent system. By comparing the patent maintenance fees systems in 23 high income countries in EU, such as the patent maintenance fee amount, the down payment and so on, the promotional impact of different models on technological innovation development was discussed. Through comprehensively analyzing the charging standards in different countries, exploring the incentive mechanism of the patent maintenance fees system, we can summarize the characteristics that promote technological innovation and economic growth in order to advice on the maintenance fees system.

**Date Sources**

In this paper, we select 23 high income countries with the GDP information in the World Bank site (Information on http://www.shihang.org.cn.). And the patent maintenance fee information in 23 high income countries in Europe (Because the limitation of maintenance fee information was disclosed by intellectual property office of each country and the retrieval methods, our research group only found the patent maintenance fee data in 23 high income countries.) is conducted from their Intellectual Property Offices or Patent Office Web sites. In these sites, we select “patent”, “maintenance fee”, “maintenance fee and form” and other key words in related pages to get the information of maintenance fees. Due to inconsistent monetary units in the collected original data, and to be compared conveniently, the article converts it into RMB unit uniformly based on exchange rates from Watergate database in 16:00 September 30, 2016.

**Comparative Analysis of the Patent Maintenance Fees System in European Countries**

**The Comparison of the Step-growth Models of Maintenance Fee**

The step-growth model of maintenance fee is the payment model that the patent owner must pay maintenance fees every year, and the patent maintenance fee amount isn’t increase yearly but every few years, and during the other years the amount remains the same. Lithuania, Portugal and Hungary implement the step-growth model. It’s shown as Figure 1.

![Figure 1. The comparison of the step-growth models of maintenance fee.](image)

As it’s shown in Figure 1, the step-growth models of maintenance fee in European countries have the following characteristics: first, all the start time of the patent maintenance fees systems in 3 countries is from the filing date of the application. Second, the start time to pay maintenance fees is
different. Third, all the patent maintenance fees in 3 countries have a growing trend, but the growth nodes and the growth rate have great differences. Fourth, the patent maintenance fee amount for each node varies. In the third to twelfth year the patent maintenance fees in Hungary are the highest; after the thirteenth year the patent maintenance fees in Portugal are the highest, followed by Hungary, and the lowest is Lithuania. Fifth, different countries have different growth rates in the growth nodes. In the third to sixth year the patent maintenance fees in Hungary increase the most, then the growth rate of maintenance fees in Portugal achieves the maximum, followed by Lithuania, and the lowest is Hungary.

With all the said, the step-growth models in the 3 countries are implemented differently since the filing date of the application, because of the great differences among the down payment, the growth node and the growth rate. Therefore, we can adjust the elements including the down payment, the growth node and the growth rate, in order to get a more scientific step-growth model.

The Comparison of the Year-on-year Growth Model of Maintenance Fee

The year-on-year growth model of maintenance fee is the payment model that the patent owner must pay maintenance fees yearly and the charging standard increases year by year. There are eleven countries that implement the year-on-year growth model, including Sweden, Slovak Republic, Austria, Switzerland, Luxembourg, United Kingdom, Ireland, Netherlands, Belgium, Greece, Slovenia. The patent maintenance fees are shown as Figure 2.

![Figure 2. The comparison of the year-on-year growth models of maintenance fee.](image)

As can be seen from Figure 2, the year-on-year growth model of maintenance fee has the following five characteristics: First, all the start time of the patent maintenance fees systems in 11 countries is from the filing date of the application. Second, the start time to pay maintenance fees is different. The down payment distribution varies greatly and the countries which pay maintenance fees since the third year from the filing date of the application are relatively more. Third, all the patent maintenance fees in 11 countries have an overall growing trend, but their growth rates and the patent maintenance fee amount differ from each other. Fourth, the growth rate is different. In the first eight years all the patent maintenance fees increase slowly, in the eighth to seventeenth year the patent maintenance fees in Austria increase the fastest, then the growth rate of maintenance fees in the Slovenia is the highest. Fifth, the patent maintenance fee amount in 11 countries is different. In the first eight years the patent maintenance fee amount in all countries is lower, after the seventh year the patent maintenance fee amount in Austria is the largest.

To sum up, the patent maintenance fees systems in 11 countries implement the year-on-year growth model differently, and most countries start to pay maintenance fees since the third year from the filing date of the application, which has an extent practical value. In the first eight years all the patent maintenance fees increase slowly, which reduces the cost for the patent owner to maintain the validity of the patent, therefore it’s helpful for the patent owners to find their way to maximize their income.
Analysis of the Incomplete Year-on-year Growth Model with the Same Amount during a Few Years of Maintenance Fee

The incomplete year-on-year growth model with the same amount during a few years is the payment model that the patent owner must pay maintenance fees yearly, but it remains the same during a few years occasionally, and in the other years the amount increases gradually. It’s shown as Figure 3.

Figure 3. The incomplete year-on-year growth model with the same amount during a few years of maintenance fee.

It’s shown as Figure 3, that the patent maintenance fees systems have the following seven characteristics: First, all the start time of maintenance fees systems in 9 countries is from the filing date of the application. Second, the start time to pay maintenance fees is different, and its distribution is balanced. Third, all the patent maintenance fees in 9 countries have an overall growing trend, but their growth rates and the patent maintenance fee amount differ from each other. Fourth, the patent maintenance fee amount in 9 countries changes differently, and the patent maintenance fee amount in 7 countries remains the same during few years in the first ten years, the others keep the same in the last five years. Fifth, the growth rate is different. In the first ten years all the patent maintenance fees increase slowly, and then the patent maintenance fees in Germany increase the fastest. Sixth, the patent maintenance fee amount in 9 countries is different. In the first ten years all the patent maintenance fee amount is lower, after the tenth year the patent maintenance fee amount in Germany is the largest. Seventh, according to analysis of GDP in 23 countries, four countries of five highest income countries in Europe implement the model.

Above all, the incomplete year-on-year model with the same amount during a few years exhibits flexibility like the year-on-year growth model, and has stability and acceptability like the step-growth model. Patent income increases with the granted time increasing, and the year-on-year growth model is more in line with the actual situation. Keeping the patent maintenance fee amount the same during the early stage helps the patent owner to accept and pay maintenance fees. There is more significance compared to the step-growth model and the year-on-year growth model.

Conclusions

To sum up, five points can be concluded: First, due to their different specific legal, economic, historical and the other factors, the countries exist a maintenance fee charging standard which is beneficial to the development of its patent system, although the standard for the country isn’t optimal, or it’s optimal at this moment but not in the future. Second, most countries or areas set the charging standard according to the course of the profit from patent. They present an overall growing trend, and in the first eight years the patent maintenance fees in most countries increase relatively slowly. Third, the down payment of European countries on maintenance fees has a scattered distribution. The countries which pay maintenance fees from the third year to the sixth year since the filing date of the
application are relatively more. As the study of Harhoff and Wagner shown, from 1982 to 1988 the average granted time of EPO is 4.2 years. Thus the institutional arrangement is reasonable, in case of the part of the patent maintenance fees system being a dead letter. Fourth, there are various patent maintenance fee models, including the step-growth model, the year-on-year growth model and the incomplete year-on-year growth model with the same amount during a few years. In the 23 European countries, the year-on-year growth model occupies the largest percentage. Fifth, according to the patent maintenance fees models, theoretically the incomplete year-on-year growth model with the same amount during a few years is more reasonable, because of combining the advantages of different models. And according to per capita income in 23 countries, four countries of five highest income countries in Europe implement the model, the reasons need a further study.

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References