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HOW MUCH SHOULD A FRANCHISEE PAY? A NEW MODEL OF CALCULATION OF ROYALTIES

Abstracts: Existing algorithm of payment for external intellectual property is *analyzed. It is demonstrated that this algorithm cannot be universal. Different models of royalty rate calculation in case of franchising are proposed and discussed. The difference between royalty rate in case of franchising and licensing is calculated. It is also demonstrated that with the increase of additional income the input of risk reduction into the value of royalty decreases.*

Key words: *royalty, royalty rate, franchising, franchisee, franchisor, risk, income.*

JEL Classification: C51, L11, L24

1. Introduction

The starting point of my research is the well known fact that benefits that the user of external intellectual property gets are different for licensing and franchising. Both licensing and franchising provide the user with the possibility to earn higher profits (thanks to higher prices on products and services sold under licensor's (respectively, franchisor's) trade mark). However, in addition to this advantage, franchisee's business is less risky thanks to well-known trade mark and effective commercial technologies that attract customers and give a guarantee against failure. This advantage of franchising is crucial for potential franchisees as it protects their investments and provides them and their families (as franchisees are in most cases small businesses and franchise outlets they operate are most often the only source of their income) with a guaranteed source of income. This aspect is absent in case of licensing where licensee is the only responsible for all risks connected with sales of licensed products on a new market and licensor's trade mark and products are usually not well known to licensee's target audience.

Of course, this risk reduction exists only in case of well-established franchising chains with good reputation. Franchisors who are just starting their expansion and have a small number of outlets (or no outlets at all) cannot offer this advantage to potential franchisees. Actually, such new franchises are even more risky than licenses.

However, despite this difference, the method of calculation of price of intellectual property is the same for licensing and franchising.

There are different approaches to calculation of royalties, but the most common method is based on the following formula:

$$R = rV \quad , \tag{1}$$

R – amount of a single royalty payment;

r – royalty rate;

V – sales turnover (generated by products and services produced on the basis of external intellectual property).

It can be easily seen from the formula (1) that the key component of this algorithm of calculation is royalty rate. Therefore it is necessary to have a clear procedure of calculation of the value of royalty rate in order to use this formula.

Such a procedure exists for licensing where the following method applies:

$$r_{lic} = \frac{kP_{\sup}}{P_{lic}} = \frac{k(P_{lic} - P_{us})}{P_{lic}} = \frac{kP_{\sup}}{P_{us} + P_{\sup}} \; , \tag{2}$$

r_{lic} – royalty rate in case of licensing;

k – licensor's share in the licensee's extra-income;

$P_{\sup}$ – licensee's extra-income (earned thanks to intellectual property provided by the licensor);

P_{us} – licensee's regular income (the income that this company would have earned if it had been selling similar non-licensed goods in the same area – in other words, the income that this company would have earned it had not used franchisor's intellectual property);

P_{lic} – licensee's total income.

The formula (2) includes an indefinite component that has to be calculated so that this formula could be used. This component is obviously k. Unfortunately, there is no generally accepted algorithm of calculation of k, and in real business practice its value is defined according to traditions that exist in the industry (Azgaldov, Karpova, 2000). Its average value, according to experts, is around 25%.

While it is not the main goal of the present paper, I would say that it would be logical to assume that k should be equal to licensor's contribution to licensee's income:

$$k = \frac{P_{\sup}}{P_{us} + P_{\sup}} \, . \tag{3}$$

The same model is usually applied to franchising – in other words, it is believed that the main benefit franchisee receives from franchising is additional income generated by intellectual property and managerial support provided by franchisor (Kabak, 2005), (Stazhkova 2007). It is interesting to stress that despite the fact that the book (Stazhkova 2007) is dedicated to franchising, formulae and models described therein are absolutely identical to models existing for licensing. Risk reduction is omitted in this model.

However, as franchisee gets two benefits (higher incomes and lower risks), he has to pay for both of them as any economical benefit must be paid for. It means that franchisor should receive not only a share in the extra-income produced by the intellectual property rented to franchisee (and by managerial support given to franchisee), but also a payment for the risk reduction. Therefore, it is necessary to develop a model of royalty rate calculation that would include both components of franchisee's payment to franchisor. An attempt at developing such a model is the main goal of the present paper.

As royalty rate plays a key role in franchising relations – it determines the proportion of additional income sharing between franchisor and franchisee and serves as an indicator of franchise chain quality (Kaufmann, Lafontaine, 1994) – it is studied in many works. Most important among them are, in my opinion, (Rubin, 1978), (Minkler, 1992), (Mathewson, Winter, 1988), (Lafontaine, 1992), (Lafontaine, 1993), (Rao, Srinisavan, 1995), (Blair, Lafontaine, 2005), (Dnes, 2009), (Michael, 2009). Results obtained in these papers include models (based mostly on agent theory and theory of contracts) of correct sharing of additional income between franchisor and franchisee depending on their contribution (Blair, Lafontaine, 2005). There has also been a substantial amount of empirical studies that include (Norton 1988), (Pénard, Raynaud, Saussier, 2003), (Agrawal, Lal, 1995), (Chaudey, Fadairo 2010), (Minguela-Rata, Lopez-Sanchez, Rodriguez-Benavides 2010).

Obviously, there also are many papers dealing with problems of risk in case of franchising (Martin, 1998), (Lafontaine, Bhattacharyya 1995). But, to the best of my knowledge, no attempts to include risk reduction in the model of royalty calculations were made.

An attempt to fill in this gap was made in a recent paper (Kotliarov 2011), where the following assumption was made: as it is necessary to take into account risk reduction, it would be logical to analyze not the total income of a franchisee P_{fr}, but his expected (probabilistic) income V_{fr}

$$V_{fr} = W_{fr} P_{fr},$$

W_{fr} – *ex ante* probability to earn total income P_{fr}.

Obviously

$$W_{fr} P_{fr} = (W_{ind} + W_{\sup})(P_{ind} + P_{\sup}),$$

P_{ind} – average total income of an independent entrepreneur (generated by sales of the same quantity of similar products or services under his own trade mark in the same area during the period equal to the period of validity of franchising agreement);

W_{ind} – probability to earn the income P_{ind} by an independent entrepreneur. The key factor this probability depends on is the survival rate of new companies in this area;

$W_{\sup}$ – additional probability to earn income thanks to intellectual assets and managerial support provided by the franchisor. This additional probability reflects the fact that franchisee's business is less risky than independent businesses thanks to well-known brand, effective commercial technologies and managerial support;

$P_{\sup}$ – additional income earned by franchisee thanks to franchisor's intellectual assets (in comparison to income that an independent entrepreneur can earn).

On a basis of these assumptions the following model of royalty rate calculation was proposed:

$$r_{fr} = \frac{AW_{ind}P_{ind} + BW_{\sup}P_{ind} + CW_{ind}P_{\sup} + DW_{\sup}P_{\sup}}{W_{ind}P_{ind} + W_{\sup}P_{ind} + W_{ind}P_{\sup} + W_{\sup}P_{\sup}}, \quad (4)$$

A, B, C, D – franchisor's share in the respective component of franchisee's income (these shares are not equal). Obviously, $0 \le A \le 1$, $0 \le B \le 1$, $0 \le C \le 1$, $0 \le D \le 1$.

So, instead of one parameter of distribution k existing in the model of royalty calculation in case of licensing this new model introduces four parameters of distribution. So the key problem is to find an algorithm of calculation of these parameters.

In the paper (Kotliarov 2011) some algorithms are described, but they are introduced without justification. The goal of the present paper is to analyze these algorithms, to propose new algorithms (if necessary) and to calculate the difference between values of royalty rates obtained according to traditional and new method.

2. Possible models of income sharing

A closer look at the formula (4) shows that the numerator in its right part includes "heterogeneous" and "homogenous" components. Homogenous components are those for which lower indexes of both factors are the same (it means that the respective component of franchisee's income is generated by one participant of the franchising agreement – either by the franchisee himself or by the franchisor). Similarly, heterogeneous components are those for which lower indexes of both factors are different (and, therefore, these components are generated by common efforts of franchisee and franchisors).

In my opinion, it is enough to design a procedure of income sharing for heterogeneous components only, while homogenous components should go to the corresponding participant of the franchising agreement). So A = 0 (as this component of franchisee's income would have been earned even if the franchisee had not received intellectual property from the franchisor), while D = 1 (as this component is completely generated by the intellectual assets provided by the franchisor).

Let us proceed to different possible models of income sharing.

2.1. Quasi-equal model

The most simple and logical formulae from both economical and mathematical points of view would be the following:

$$B = \frac{W_{\sup}}{W_{\sup} + W_{ind}}, \; C = \frac{P_{\sup}}{P_{\sup} + P_{ind}}. \quad (5)$$

First of all, while values of B and C are indeed proportional to franchisor's contribution to heterogeneous components, the same is generally not true for franchisee as his share in heterogeneous components ($1 - B$ and $1 - C$ respectively) may not be proportional to his contribution. Indeed, while franchisor contributes to the component $W_{\sup}P_{ind}$ with additional probability, franchisee contributes to the same component with his regular (basic) income. Contrarily to this, while franchisor contributes to the component $W_{ind}P_{\sup}$ with additional income, franchisee contributes to the same component with his regular (basic) probability to survive. So if shares were proportional to contributions for franchisor and franchisee then the following equations would be true (according to (5)):

$$\frac{W_{\sup}}{W_{\sup} + W_{ind}} = 1 - \frac{P_{ind}}{P_{\sup} + P_{ind}}, \quad (6)$$

$$\frac{P_{\sup}}{P_{\sup} + P_{ind}} = 1 - \frac{W_{ind}}{W_{\sup} + W_{ind}}. \quad (7)$$

Obviously,

$$\frac{W_{\sup}}{W_{\sup} + W_{ind}} = 1 - \frac{W_{ind}}{W_{\sup} + W_{ind}}, \quad (8)$$

$$\frac{P_{\sup}}{P_{\sup} + P_{ind}} = 1 - \frac{P_{ind}}{P_{\sup} + P_{ind}}. \quad (9)$$

Conditions (6-9) mean that shares of franchisor and franchisee in heterogeneous components of franchisee's income are proportional to their contributions to these components if and only if the requirement (10) is met.

$$\frac{W_{ind}}{W_{\sup} + W_{ind}} = \frac{P_{ind}}{P_{\sup} + P_{ind}}, \quad (10)$$

Obviously, it is not always true. This is why this model is called quasi-equal.

It may seem that the method (5) has to be amended in order to allow correct (proportional) distribution of heterogeneous components between franchisor and franchisee.

The second problem is more important (and, contrarily to the first problem, is not discussed in (Kotliarov 2011)). It is logical to expect that franchisee's "real" income $P_{fr}^{real} = P_{fr} - R$ will be higher than income earned by independent businessmen (otherwise potential franchisees may be not interested in purchasing this franchise):

$$R_{fr}^{real} = \frac{W_{ind}P_{ind} + (1-B)W_{\sup}P_{ind} + (1-C)W_{ind}P_{\sup}}{W_{\sup} + W_{ind}} > P_{ind}.$$

It is easy to see from this formula that this requirement is met if

$$BW_{\sup}P_{ind} < (1-C)W_{ind}P_{\sup}.$$

According to (7) this formula can be rewritten as

$$\frac{W_{\sup}}{W_{\sup} + W_{ind}} W_{\sup}P_{ind} < \left(1 - \frac{P_{\sup}}{P_{\sup} + P_{ind}}\right) W_{ind}P_{\sup},$$

$$\frac{W_{\sup}}{W_{\sup} + W_{ind}} \cdot \frac{W_{\sup}}{W_{ind}} < \frac{P_{\sup}}{P_{\sup} + P_{ind}}. \tag{11}$$

It is interesting to check out if the requirement (12) is met in real franchising. According to different data, approximately 80% of franchisees survive after a 5-year period, while only 20% of independent companies do. It means that $W_{ind} = 0.2$ and $W_{\sup} = 0.6$. Let us put these values in the formula (11). It is easy to calculate that

$$\frac{W_{\sup}}{W_{\sup} + W_{ind}} \cdot \frac{W_{\sup}}{W_{ind}} = \frac{0.6}{0.8} \cdot \frac{0.6}{0.2} = 2.25,$$

so

$$\frac{P_{\sup}}{P_{\sup} + P_{ind}} > 2.25,$$

which is impossible if $P_{\sup} > 0$ and $P_{ind} > 0$. So in real franchising contracts franchisee's income calculated according to the method (7) will be lower than income earned by independent businessman.

In order for the requirement (11) to be realistic the following limitation should be introduced:

$$\frac{W_{\sup}}{W_{ind}} < 1 + \frac{W_{ind}}{W_{\sup}}. \tag{12}$$

If the requirement (13) is not met, then the requirement (12) will not be met either, and franchisee will loose money in comparison with independent businessman's income.

It means that using the basic model (5) in real franchising situation (that is, in situation when the requirement (11) is not respected) will lead to franchisee's loosing money (in comparison with income earned by independent businessman) which is hardly acceptable. There may be two possible solutions for this problem:

- Franchisee has to accept this scheme of income sharing despite the fact that his real income will be lower. Indeed, in some situation this approach could be accepted by franchisees, especially in case of popular franchisees. But in general it would be logical to expect that franchisee will wish to have his income not decreased in comparison with independent businessmen;

- The method (5) has to be amended in order avoid franchisee's loosing money. Such an amendment may be made within the model that I propose to call franchisee-friendly.

2.2. Franchisee-friendly model

It is obvious from the formula (4) that franchisee's income will not be lower than income earned by independent businessman if $B = 0$:

$$R_{fr}^{real} = \frac{W_{ind}P_{ind} + W_{\sup}P_{ind} + (1-C)W_{ind}P_{\sup}}{W_{\sup} + W_{ind}} =$$

$$= P_{ind} + \frac{(1-C)W_{ind}P_{\sup}}{W_{\sup} + W_{ind}} \geq P_{ind}.$$

C may be assigned any value between 0 and 1. In order for real income R_{fr}^{real} to be higher than P_{ind} the following requirement should be met: $C < 1$. As it is interesting to try to amend the quasi-equal model, then $C = \frac{P_{\sup}}{P_{ind} + P_{\sup}}$. Therefore, the following formula for royalty rate calculation should be used in order to protect franchisee against loosing money:

$$r = \frac{CW_{ind}P_{\sup} + W_{\sup}P_{\sup}}{W_{ind}P_{ind} + W_{\sup}P_{ind} + W_{ind}P_{\sup} + W_{\sup}P_{\sup}}, \quad (13)$$

In this case

$$\Delta = r_{fr} + r_{lic} - \frac{CW_{ind}P_{\sup} + W_{\sup}P_{\sup}}{(W_{ind} + W_{\sup})(P_{ind} + P_{\sup})} - \frac{kP_{\sup}}{P_{ind} + P_{\sup}} =$$

$$= \frac{W_{ind}P_{\sup}(C-k) + W_{\sup}P_{ind}(1-k)}{(W_{ind} + W_{\sup})(P_{ind} + P_{\sup})}$$

If the formula (3) is accepted, then, obviously, $k = C$ and

$$\Delta = \frac{W_{\sup}P_{ind}(1-C)}{(W_{ind} + W_{\sup})(P_{ind} + P_{\sup})}. \quad (14)$$

Obviously, Δ calculated according to the formula (15) is always non-negative ($\Delta \geq 0$, as $W_{\sup} \geq 0$, $P_{ind} \geq 0$, $0 \leq C < 1$).

Interestingly enough, the formula (13) may seem to accept the situation, in which $\Delta < 0$ – it is possible when

$$\frac{W_{\sup}P_{ind}}{W_{ind}P_{\sup}}(1-k) < k - C.$$

However, this proportion is hardly possible in real business practice.

It is easy to deduce from the formula (14) the following results:

1. The higher is the additional income, the lower is this difference:

$$\frac{\partial \Delta}{\partial P_{\sup}} < 0,\ W_{\sup} = const; \qquad (15)$$

2. The higher is the additional probability, the slower increases this difference:

$$\frac{\partial \Delta}{\partial W_{\sup}} > 0,\ \frac{\partial^2 \Delta}{\partial W_{\sup}^2} < 0,\ P_{\sup} = const.$$

The observation (15) means that, provided the additional income is high enough, the payment for risk reduction does not play an important part within the royalty rate. It may be partially supported by the empirical results obtained by Kabir Sen (1993) that franchisee's risk does not affect the franchise payments structure.

2.3. Equivalent model

It is interesting to try to find such values of the sharing parameters *A*, *B*, *C* and *D* so that $r_{lic} = r_{fr}$. It can be easily seen from the formula (4) that the solution is

$$A = B = 0,\ C = D = k,$$

or, if one takes into account the formula (2a),

$$C = D = \frac{P_{\sup}}{P_{ind} + P_{\sup}}.$$

However, it was stated above that *D* = 1 under any circumstances as this part of franchisee income is completely generated by intellectual assets provided by franchisor and therefore it should be taken by franchisor, not shared between franchisor and franchisee. As in real situations $\frac{P_{\sup}}{P_{ind} + P_{\sup}} < 1$, this model of royalty rate calculation cannot be recommended for practical use.

However, there may be another way to implement the model $r_{lic} = r_{fr}$ with $C \neq D,\ D = 1$. In this case *C* should fit the following equation:

$$CW_{ind}P_{\sup} + W_{\sup}P_{\sup} = kW_{ind}P_{\sup} + kW_{\sup}P_{\sup},$$

or

$$C = \frac{kW_{ind}P_{\sup} + (k-1)W_{\sup}P_{\sup}}{W_{ind}P_{\sup}} = k + (k-1)\frac{W_{\sup}}{W_{ind}}. \qquad (16)$$

It is quite obvious that in real business practice C calculated according to the formula (18) will be below 0, which is impossible. Therefore, it is impossible to ensure the equation $r_{lic} = r_{fr}$ if $D = 1$.

3. Conclusion

Of course, the approach described in the present paper is simplistic. It does not take into account the probabilistic distribution of additional income and additional probability of survival.

From the technical point of view it requires complete statistical information on performance of franchisees and independent businessmen (but on markets with established traditions of franchising this is not a problem as this information is available).

However, this model can be used as a basis for following research and, as I hope, will help both researchers and practitioners to better understand the nature of franchising and to take into account all its aspects.

It is interesting to mention that within virtually all models of royalty rate calculations proposed in the present paper the value of royalty in case of franchising should be higher than the royalty rate for a license with similar income characteristics. This represents a good basis for empirical testing of this hypothesis (that is, if for most franchises royalty rate is higher than in case of licensee generating similar income, then risk reduction is included into royalty rate – implicitly).

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