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Royalty Rate Structure in Case of Franchising

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The present article contains an analysis of differences between licensing and franchising. It is demonstrated that models of royalty rate calculation developed for licensing should not be applied to franchising as benefits received by licensee and franchisee are different. It is proposed to include in the model of royalty calculation the risk reduction generated by franchisor's effective technologies and managerial support that are given to franchisee. It is demonstrated that franchisee may wish to acquire the franchise even if franchisor takes the full amount of additional income or if this additional income is negative.

Key Words: Royalty; Royalty rate; Franchising; Franchisee; Franchisor; Risk; Income.

JEL Classification Numbers: C51, L11, L24.

1. INTRODUCTION

Payments for the right to use external intellectual property include two components:

• An upfront fee U (that is also called initial fee) that has to be paid upon signing the contract;

• Royalties R that are paid regularly during the period of contract; amounts of royalty payments vary depending on different factors (first of all — user's income).

So the total amount TA that the user will pay to the owner of the intellectual property is equal to

$$TA = U + \sum_{i=1}^{n} R_i,$$

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n — number of royalty payments during the period of contract (Brickley 2002).

Theoretical and empirical analysis of establishing proportion between upfront fee and royalties in the total amount of payments is made in (Brickley 2002) and (Vazquez 2005).

Either U or the sum of royalty payments may be equal to 0. If $U = 0$, then the user only pays royalties, if the sum of royalty is equal to 0, then the user pays only an upfront fee. In order to simplify the analysis, only the former model will be discussed in the present paper. But, obviously, all these models are closely related and the transition from royalty-based scheme to two-component scheme and to lump-sum payment will be demonstrated below.

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

$$R = \frac{r}{100\%}V, \tag{1}$$

R — amount of a single royalty payment;

r — royalty rate, %;

V — sales turnover (based on 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:

$$r = \frac{kP_{sup}}{P_{lic}} \cdot 100\% = \frac{k(P_{lic} - P_{us})}{P_{lic}} \cdot 100\% = \frac{kP_{sup}}{P_{us} + P_{sup}}, \tag{2}$$

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.

However, 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%.

The same model is usually applied to franchising C 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).

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 (Rubin, 1978), (Minkler, 1992), (Mathewson, Winter, 1988), (Lafontaine, 1992), (Lafontaine, 1993), (Rao, Srinisavan, 1995), (Blair, Lafontaine, 2005), (Dnes, 2009), (Michael, 2009), (Muravyova 2009). Problem of correspondence between franchisee's prices and royalty rates is analyzed in (Algazina 2008). 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 but obviously are not limited to (Norton 1988), (Pnard, Raynaud, Saussier, 2003), (Agrawal, Lal, 1995), (Minguela-Rata, Lopez-Sanchez, Rodriguez-Benavides 2010). An analysis of dynamics of royalty policy over time is made in (Shaw, Lafontaine, 2007).

Problems related to application of this model to business practice are described in (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.

However, in my opinion, this extrapolation of the formula (2) on franchising (all papers quoted above are based on this approach) is not correct as the nature of relations between franchisor and franchisee is different from relations that exist between licensor and licensee. Therefore it would be useful to analyze this difference and to try to find out how it may affect the algorithm of royalty calculation.

2. OBJECTIVES

In my opinion, the main difference between licensing and franchising is as follows:

- In case of licensing the licensee simply includes licensed products into its product range, therefore, the main profit of licensee is indeed additional income generated by intellectual assets provided by the licensor;
- In case of franchising the franchisee sets up a new business which will act under the franchisor's brand and according to the franchisor's commercial technologies. It means that franchisee gets not only a possibility

to earn extra-income — he gets a possibility to run his own business. Interestingly enough, this aspect of franchising is seen is sources as its key feature, but, to the best of my knowledge, there had been no attempts at its mathematical formalization.

So the benefits that franchisor offers to franchisee include the following:

• The possibility to earn an extra-income in comparison to other companies that sell similar products or services (this possibility is common for both licensing and franchising);

• Lesser business risks thanks to well-known trade mark and effective commercial technologies that attract customers and give a guarantee against failure (an empirical study of factors that determine this effect for franchisee is made in Minguela-Rata, Lopez-Sanchez, Rodriguez-Benavides, 2010). 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) with a guaranteed source of income. This aspect is absent in case of licensing where licensee is the only responsible for all risks related to 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.

It means that franchisee should compensate franchisor for both benefits — the franchisor should receive not only a share in the extra-income produced by the intellectual property rented to franchisee (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 include both components of franchisee's payment to franchisor. An attempt at developing such a model is the main goal of the present paper.

Obviously, problems of risk in case of franchising has been analyzed by many researchers (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.

3. METHODS

In order to simplify the modeling process I will presume that the only payment franchisee makes to franchisor is royalty. Initial fee is excluded from the model (however, as I will try to demonstrate below, the model can be easily modified to include initial fee).

As the model takes into account risks it would be logical to analyze not the total income of a franchisee P_{fr}, but his probabilistic income V_{fr}:

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

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

The concept of probabilistic income is used in franchising studies (for example, in order to describe the procedure of potential franchisee's decision-making about joining the network (Blair, Lafontaine 2005: 266)), but it was not applied to royalty calculation.

Contrarily to present studies in the field of royalty analysis that are based on theory of contracts and games theory, the proposed paper is based on the notion of risk reduction and on basic probabilistic models.

Total income represents an average amount of money a franchisee is expected to receive thanks to the sales of licensed products and services in the prescribed area until the franchising agreement expires. Information necessary to calculate the values of W_{fr} and P_{fr} can be obtained from statistical data. The following formulae can be used:

$$W_{fr} = \frac{\sum_{j=C+1}^{n+C} M_j}{\sum_{i=1}^{n} N_i},$$

N_i — number of new franchisees in the year i;

n — number of years that was taken for statistical analysis;

C — regular duration of the franchise contract, years;

M_j — number of franchisees that started their business in the year i and survived till the year j;

$$P_{fr} = \frac{\sum_{j=C+1}^{n+C} \sum_{k=1}^{M_j} P_{kj}}{\sum_{j=C+1}^{n+C} M_j},$$

P_{kj} — total income (income earned during the total period of franchise contract) by the k-th franchisee that started its business in the year i and survived till the year j (more advanced model of outlets survival can be found in (Perrigot 2008)).

An empirical study for factors that influence the performance of franchisee outlets has recently been made in (Minguela-Rata, Lopez-Sabchez, Rodriguez-Benavides 2010).

By analogy probabilistic income of an independent entrepreneur V_{ind} can be introduced:

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

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 same period — that is, for businesses that started their activity during the period n and remained active till the period $n + C$);

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.

Formulae used to calculate these values are similar to the formulae above.

An empirical analysis of factors that affect the performance of an independent entrepreneur is made in (de Jorge Moreno, Laborda Castillo, de Zuani Masere, 2010).

Obviously

$$W_{fr}P_{fr} = (W_{ind} + W_{sup})(P_{ind} + P_{sup}), \tag{3}$$

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).

It is normally supposed that

$$W_{sup} > 0, P_{sup} > 0,$$

but, as I will try to demonstrate below, this is not always true and franchisee may wish to join the franchise network even in the additional income is negative. However, for the time being I will suppose that values of additional income and additional probability are positive in order to simplify the analysis.

I receive, by expanding the formula (3), the following:

$$W_{fr}P_{fr} = W_{ind}P_{ind} + W_{sup}P_{ind} + W_{ind}P_{sup} + W_{sup}P_{sup}. \tag{4}$$

To the best of my knowledge, no equivalents of the formula (4) were proposed in the previous literature dedicated to the problem of royalty rate calculation. This probabilistic approach helps to highlight two main features of franchising that makes it attractive for potential franchisees — possibility to earn morn and possibility to reduce risks.

4. RESULTS

4.1. Revised model of calculation of royalties

It is obvious from the formulae (2) and (4) that the following formula should be used for royalty rate calculation:

$$r = \frac{AW_{ind}P_{ind} + BW_{sup}P_{ind} + CW_{ind}P_{sup} + DW_{sup}P_{sup}}{W_{ind}P_{ind} + W_{sup}P_{ind} + W_{ind}P_{sup} + W_{sup}P_{sup}} \cdot 100\%, \tag{5}$$

A, B, C, D — franchisor's share in the respective component of franchisee's income (these shares are not equal).

Therefore, contrarily to licensee's income (that includes only two components), franchisee's income has four components. So in order to develop a correct method of royalty calculation for practical purposes one must find out how A, B, C, D can be calculated. Obviously,

$$0 \leq A \leq 1, 0 \leq B \leq 1, 0 \leq C \leq 1, 0 \leq D \leq 1. \qquad (6)$$

A closer look at the formula (4) shows that 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 produced 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).

It is necessary to highlight that in addition to the formula (2) there is in alternative method of royalty calculation, according to which franchisee should pay to franchisor a lump sum that does not depend on his/her sales. I think that this lump sump R_{fix} may be calculated as

$$R_{fix} = W_{sup} P_{sup}^{av},$$

P_{sup}^{av} — average extra-income of a franchisee of this franchising chain (obviously, $A = B = C = 0, D = 1$). This amount is the economically justified lower level of royalty. If the royalty amount is below this lump-sum (mathematically, if $D < 1$), then the franchisor not only does not perceive a part of franchisee's extra-income, he loses his income.

So the main task that has to be solved in order for the formula (5) to be useful for practical purposes is the procedure of calculation of B and C. In my opinion, the most simple and logical formulae from both economical and mathematical points of view would be the following:

$$B = \frac{W_{sup}}{W_{sup} + W_{ind}}, C = \frac{P_{sup}}{P_{sup} + P_{ind}}. \qquad (7)$$

It means that franchisor's shares in heterogeneous components of franchisee's income are proportional to his contribution to these components. The formulae (7) will hereafter be referred to as "basic" and all other models studied below will be compared to the formulae (7).

But the same is generally not true for franchisee as his share in heterogeneous components 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 (6)):

$$\frac{W_{sup}}{W_{sup}+W_{ind}} = 1-\frac{P_{ind}}{P_{sup}+P_{ind}}, \tag{8a}$$

$$\frac{P_{sup}}{P_{sup}+P_{ind}} = 1-\frac{W_{ind}}{W_{sup}+W_{ind}}. \tag{8b}$$

If one subtracts the equation (8b) from the equation (8a) it is easy to arrive to the formula

$$\frac{W_{sup}-W_{ind}}{W_{sup}+W_{ind}} = \frac{P_{sup}-P_{ind}}{P_{sup}+P_{ind}}. \tag{9}$$

It means 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 (9) is met. Obviously, it is not always true. Therefore, it may seem that the method (7) has to be amended in order to allow correct (proportional) distribution of heterogeneous components between franchisor and franchisee.

Before one starts making such an amendment, it is important to remember that it is up to franchisor to set up the royalty rates. Franchisor possesses brand name and commercial technologies and he obviously wishes to sell them to franchisee at maximum price. It means that absolutely proportional distribution of heterogeneous components within the model (4) if the requirement (9) is not met is impossible C franchisor will set up the royalty rate according to his interests.

Let us study possible models of calculation of B — it is clear that the same models could be used for C.

If the requirement (9) is not met, then two situations are possible:

$$\frac{W_{sup}}{W_{sup}+W_{ind}} < 1-\frac{P_{ind}}{P_{sup}+P_{ind}} \tag{10a}$$

and

$$\frac{W_{sup}}{W_{sup}+W_{ind}} > 1-\frac{P_{ind}}{P_{sup}+P_{ind}}. \tag{10b}$$

According to the first formula, there is a surplus S (in the total amount formed by heterogeneous components) that was not distributed between franchisor and franchisee:

$$S = 1-\frac{P_{ind}}{P_{sup}+P_{ind}}-\frac{W_{sup}}{W_{sup}+W_{ind}} > 0. \tag{11}$$

Franchisor may choose to take this surplus, then

$$B = \frac{W_{sup}}{W_{sup}+W_{ind}} + S.$$

It corresponds to maximization of franchisor's income and/or a very known and effective franchise brand.

Franchisor may also wish to give this surplus to franchisee in order to motivate him (quite a logical solution in a new area). In this case

$$1-B = \frac{P_{ind}}{P_{sup}+P_{ind}} + S.$$

In both cases franchisee's share in the heterogeneous components is at least proportional to his contribution and (if surplus is given to franchisee) may exceed it.

Formula (10b) corresponds to a shortage Sh:

$$Sh = 1-\frac{P_{ind}}{P_{sup}+P_{ind}}-\frac{W_{sup}}{W_{sup}+W_{ind}} < 0.$$

In this case

$$B = \frac{W_{sup}}{W_{sup}+W_{ind}}$$

and

$$1-B = \frac{P_{ind}}{P_{sup}+P_{ind}} + Sh < \frac{P_{ind}}{P_{sup}+P_{ind}}.$$

It means that franchisee's share in heterogeneous components is inferior to his contribution.

So the full description of the basic method is as follows:

$$B = \frac{W_{sup}}{W_{sup} + W_{ind}} \qquad (12)$$

in one of the following situations:

1. If the requirement (9) is met;
2. If the condition (10a) is respected, and the surplus (11) is given to franchisee;
3. If the condition (10b) is respected.

If the condition (10a) is respected and the surplus (11) is taken by the franchisor, then

$$B = \frac{W_{sup}}{W_{sup} + W_{ind}} + S. \qquad (13)$$

The same formulae should be used for C.

However, franchisor may wish to choose other methods for calculation of B and C in order to adapt his/her royalty policy to specific conditions of the market or to maximize his/her income. Of course, all these methods cannot be discussed at length in one paper, so I will try to describe most evident cases below.

Again, it is important to remember that contrarily to licensing, where the total license cost (including royalties) is generally set up on a basis of negotiations between licensor and licensee, in case of franchising royalty rate is normally set up by franchisor and franchisee may not negotiate its modification. So it is up to franchisor to choose any method of income sharing.

It is supposed in all further schemes that $A = 0$ and $D = 1$.

1. $B = C = 1$. It means that franchisor, in order to maximize his/her income, takes back all heterogeneous components of franchisee's income. This model may be used if franchisor's brand is well known on the market and the market itself is traditional for this brand (the same region where the franchisor himself operates, for example, and where customers know and like franchisor's trade mark, products and services). Of course, this model is uncomfortable for franchisee, as he/she looses all possible additional income, however, it is still acceptable for him/her — as franchising nevertheless guarantees that franchisee will survive with probability W_{fr} (not W_{ind}), franchisee, while loosing income, still minimizes his/her risks.

From the mathematical point of view, this approach is justified when

$$W_{sup} \gg w_{ind}, P_{sup} \gg P_{ind}.$$

In other cases it is simply a confiscation of franchisee's income.

Interestingly enough, this approach to distribution of heterogeneous components of franchisee's income shows the difference between franchising in licensing. Licensee is interested in maximization of income and will not agree if licensor decides to take back all additional income produced by his intellectual assets that licensee uses. Contrarily to this, franchisee will accept this removal of all additional income as he/she is mostly interested in risk reduction which franchising ensures;

2. The following formula may be used to calculate B and C:

$$B = C = \max\left\{\frac{W_{sup}}{W_{sup}+W_{ind}}; \frac{P_{sup}}{P_{sup}+P_{ind}}\right\}. \qquad (14)$$

This model corresponds to maximization of franchisor's income at the expense of franchisee.

Franchisor's additional income (compared to formulae (12-13)) R_{add} is equal to

$$\begin{aligned} R_{add} &= \left[\max\left\{\frac{W_{sup}}{W_{sup}+W_{ind}}; \frac{P_{sup}}{P_{sup}+P_{ind}}\right\} - \frac{W_{sup}}{W_{sup}+W_{ind}}\right] W_{sup}P_{ind} \\ &+ \left[\max\left\{\frac{W_{sup}}{W_{sup}+W_{ind}}; \frac{P_{sup}}{P_{sup}+P_{ind}}\right\} - \frac{P_{sup}}{P_{sup}+P_{ind}}\right] W_{ind}P_{sup}. \qquad (15) \end{aligned}$$

It is obvious that one of the components of the formula (9) is equal to 0.

Probably this method may be used as an intermediary stage between the basic method (formula (12-13)) and the first method described above ($B = C = 1$) — when franchisor, while wishing to maximize his/her income, still does not want to seize all heterogeneous components. So it may be recommended for stable markets where franchisor's trade mark and products are well known;

3. B and C are calculated as follows:

$$B = C = \min\left\{\frac{W_{sup}}{W_{sup}+W_{ind}}; \frac{P_{sup}}{P_{sup}+P_{ind}}\right\}. \qquad (16)$$

Contrarily to the model (8), this approach helps franchisee to increase his/her income at the expense of franchisor. It may be used to motivate franchisee on hard markets where much efforts are required from franchisee in order to start and develop his/her business under franchisor's trade mark (for example, on new markets, where franchisor's commercial technologies are still effective, but the chain's brand and products are not well known).

Income R_l that franchisor looses in this case (in comparison with the basic method (12-13)) can be calculated according to the following formula:

$$\begin{aligned} R_l \;=\; & \left[\frac{W_{sup}}{W_{sup}+W_{ind}} - \min\left\{\frac{W_{sup}}{W_{sup}+W_{ind}}; \frac{P_{sup}}{P_{sup}+P_{ind}}\right\}\right] W_{sup}P_{ind} \\ & + \left[\frac{P_{sup}}{P_{sup}+P_{ind}} - \min\left\{\frac{W_{sup}}{W_{sup}+W_{ind}}; \frac{P_{sup}}{P_{sup}+P_{ind}}\right\}\right] W_{ind}P_{sup}; \end{aligned}$$

4. B and C are calculated as follows: one of them is equal to 1, while other is calculated according to the formula (12-13). In this case franchisor completely takes one of the heterogeneous components of income, while the second heterogeneous component is distributed among franchisor and franchisee proportionally to their contributions. From mathematical and economical points of views it means that

$$B = 1, W_{sup} \gg W_{ind}, C = \frac{P_{sup}}{P_{sup}+P_{ind}},$$

or

$$C = 1, P_{sup} \gg P_{ind}, B = \frac{W_{sup}}{W_{sup}+W_{ind}};$$

5. One of the factors is equal to 1, while the second is equal to 0. In other words, one of the heterogeneous components goes to franchisors, the second — to franchisee. This approach is very simple and useful for practical purposes. However, it should be used very carefully, as its economical basis is ambiguous: if the situation

$$\begin{aligned} B &= 1,\ W_{sup} \gg W_{ind}, \\ C &= 0,\ P_{ind} \gg P_{sup}, \end{aligned}$$

is normal and acceptable for franchisee, the situation

$$\begin{aligned} C &= 1,\ P_{sup} \gg P_{ind}, \\ B &= 0,\ W_{ind} \gg W_{sup}, \end{aligned}$$

is completely unacceptable and clearly shows that franchisee should avoid joining this network as franchisor is not able to decrease franchisee's risks;

6. Both factors B and C are equal to 0. There can be two variants of this method:

- First variant corresponds to the situation when

$$\begin{aligned} B &= 0,\ W_{ind} \gg W_{sup}, \\ C &= 0,\ P_{ind} \gg P_{sup}. \end{aligned}$$

Obviously, this variant has no economical meaning and such a franchise contract represents no interest for potential franchisees;

• Second variant is managerial and corresponds to the situation when franchisor decides to reduce his income in order to motivate potential franchisees. For practical purposes it is better transform this model into lump-sum royalties (see formula (7) above) instead of regular income-based royalties (see formula (1)).

If franchisor wishes to receive not only royalties but also an initial fee then the value of royalty rate can be found from the following equation:

$$\frac{r}{100\%} R_{tot} = IF + \frac{r_{IF}}{100\%} R_{tot}, \tag{17}$$

r — royalty rate (calculated according to the formula (5));
R_{tot} — total income that franchisee will receive during the period of franchising agreement;
IF — initial fee (its value is set up by franchisor);
r_{IF} — royalty rate (in case when initial fee is also used).

So the basic model (12-13) makes it possible to use any model of payments between franchisee and franchisor — royalty-based model, lump-sum model and two-component model. Transition between all these models can be made on the basis of the formula (17).

4.2. Probabilistic approach to decision about franchise purchase

Traditional approach to benefits that franchisee gets from franchising (possibility to earn additional income) supposes that franchisee is interested in joining franchise network if

$$P_{fr} > P_{ind},$$

or, in other words,

$$P_{sup} > 0$$

P_{fr} — average income of a franchisee;
P_{ind} — average income of an independent company;
P_{sup} — additional income provided by franchisor's brand and effective technologies, and by managerial support.

The model described in the present paper (formula (4)) stipulates that

$$V_{fr} = W_{ind} P_{ind} + W_{sup} P_{ind} + W_{ind} P_{sup} + W_{sup} P_{sup}.$$

So in order to take positive decision about franchise purchase potential franchisee has to be sure that

$$W_{sup}P_{ind} + W_{ind}P_{sup} + W_{sup}P_{sup} > 0.$$

Interestingly enough, this model makes possible a situation which is absolutely impossible within the traditional approach: franchisee may wish to join the network even if $P_{sup} < 0$. In this case

$$(1-r)(W_{ind}P_{ind} + W_{sup}P_{ind} - W_{ind}|P_{sup}| - W_{sup}|P_{sup}|) > W_{ind}P_{ind},$$

where r is royalty rate announced by franchisor, or

$$W_{sup}P_{ind} - W_{ind}|P_{sup}| - W_{sup}|P_{sup}| > \frac{r}{1-r}W_{ind}P_{ind}.$$

After obvious transformations one receives the following formula:

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

or

$$\begin{aligned} W_{sup} &> W_{ind}\frac{\frac{r}{1-r}P_{ind} + |P_{sup}|}{P_{ind} - |P_{sup}|}, \\ P_{ind} &> |P_{sup}|, \quad P_{sup} < 0. \end{aligned} \tag{18}$$

It is also possible to write down a formula for P_{sup}:

$$|P_{sup}| < P_{ind}\left(\frac{W_{sup} - \frac{r}{1-r}W_{ind}}{W_{ind} + W_{sup}}\right). \tag{19}$$

So if the formulae (18-19) are respected, then franchisee may wish to purchase the franchise even if additional income is negative.

It is important to indicate that the model with negative additional income is not purely theoretical: on poorly organized markets (like in Russia after the fall of the socialist economics) independent companies may earn mote money than franchise units thanks to absence of legal constraints. Independent companies do not pay taxes, do not use high quality products and raw materials, they pay salaries in envelopes etc. But, obviously, they run higher risks — due to this legal negligence and due to the fact that their commercial and management technologies are far from being perfect. Franchisees have to operate in full compliance with legal requirements, which naturally reduces their income, but they run lesser risks. So in such markets a businessman may well choose to loose money, but to get a more secure business.

It is possible to make similar calculations for W_{sup} (to study the situation when $W_{sup} < 0$), but this has no sense from the point of view of ideology of franchising: franchisee seeks to reduce his risks and is ready to reduce his income, not vice versa.

So the complete algorithm of decision-making about franchise purchase on a basis of information about values of W_{sup} and P_{sup} is as follows:

• if $W_{sup} > 0, P_{sup} > 0$, than purchase of this franchise is recommended;

• if $W_{sup} > 0, P_{sup} = 0$, then this franchise may be purchased (while franchisee does not increase his income, he reduces risks of his business);

• if $W_{sup} = 0, P_{sup} > 0$, then this franchise may be purchased (but this case is less interesting for franchisee);

• if $W_{sup} = 0, P_{sup} = 0$, then this franchise should not be purchased;

• if $P_{sup} < 0$, then this franchise should be purchased if requirements (18-19) are met;

• if $W_{sup} < 0$, then this franchise should not be purchased.

5. DISCUSSION

I would stress that one should not think that the proposed model of royalty calculation is purely theoretical — on markets with long franchising traditions reasonably detailed statistical data are available that can be used to calculate the parameters necessary for the formula (4) — incomes W_{sup} and W_{ind} and *ex ante* probabilities P_{sup} and P_{ind}. Probably this information should be collected by franchisors themselves (as they have the full information about their franchisees' turnover and about competitors' activity) and presented to franchisees in order to show them the advantages of joining the franchising network. However, one should avoid average values of these parameters as it may lead to wrong decisions. Values of these parameters should be different for different areas where the franchising chain operates or plans to start operating because rates of survival and average incomes are different for different regions.

This naturally puts limits for this model: it can be effectively used if there is a sufficient amount of information about survival of independent companies and franchise outlets in a given area. In new areas this model is not applicable before reliable statistical data are obtained.

However, even in new areas (that is, in regions, where the franchise chain has no experience of operating) this model could be used as a basis for approximate calculations. Franchisor simply should collect as full information as possible about values of W_{ind}, W_{sup}, P_{ind} and W_{sup} (as well as about other parameters — like average customer income etc) for all areas where his network operates. Then it could be possible to build up regression models for all these areas:

$$\begin{aligned} W_{sup} &= F(W_{ind}, P_{ind}, x_1, \ldots, x_n), \\ P_{sup} &= f(W_{ind}, P_{ind}, x_1, \ldots, x_n). \end{aligned}$$

As information about all parameters included in these formulae is usually available for all markets, it is possible for franchisors to make a rough estimation for W_{sup} and P_{sup} on the basis of these regression models even for new markets and then to use these estimations in order to calculate royalty rate according to the formula (5). Later, when franchisor manages to collect reasonable amount of statistical data about the performance of his brand in this new area, he may correct royalty rates.

It is also important to highlight that the proposed model is theoretical and needs empirical testing.

6. CONCLUSION

In my opinion, it is extremely important to remember that there is a key difference between licensing and franchising that makes it impossible to use the same models of royalty calculations for these two types of transfer of intellectual property. The nature of this difference is that franchisee, in addition to the possibility to earn additional income in comparison with sellers of no-brand products and services (licensees have the same advantage), reduces risks of his business thanks to franchisor's commercial technologies and managerial support. This risk reduction has naturally to be included in the model of royalty calculation as any benefit given within an economical contract must be paid for.

However, there are no attempts in the existing literature to take into account this risk reduction. The present paper's goal is to fill in this gap.

I hope that taking risk reduction into account would make royalty rate calculations more precise which is important for practitioners and will help to better understand the nature of financial relations between franchisees and franchisors, which would be interesting for specialists in theoretical economics.

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