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THE EXPECTATIONS OF ENTERPRISES AND METHODS OF PAYMENT FOR TECHNOLOGY 1/

by

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Introduction

The purpose of this paper is to look more closely into one aspect of the conditions governing the activities of industrial enterprises oper ting under licensing arrangements.

These conditions are greatly influenced by the terms of the agreements concluded with the licensing firms, a critical area of such agreements being the specified method of payment.

In the course of time, both parties incur the consequences of the provisions which go into effect upon conclusion of the agreement: in the case of the licensor, those which he has required of the licensee; in the case of the licensee, those which he has undertaken to fulfil.

To the degree that these provisions prove "realistic", the agreement can be implemented without unsettling pressure from either party, but if the data and judgements upon which expectations were based are later belied by the facts, conditions are bound to arise in which one or both parties will suffer economic loss, possibly leading to a break in relations and termination of the partnership.

The aim of this paper is to shed light on the logic behind the selection of a particular method of payment under a licensing agreement. Many additional factors requiring analysis fall outside the scope of these remarks, whose broad purpose is to express certain factors which are usually regarded as purely subjective in the form of objective and explicit variables.

The next step after this analysis would be to interpret real figures - the royalties and fixed fees actually negotiated on the basis of expectations and operating conditions in different areas of activity. The purpose of this is not only to gain an understanding of the actual process, but also to guide it towards the kind of rational functioning that can guarantee to the parties involved - and thus to the entire economy - an efficient use of their resources.

The different methods of payment

Enterprises usually pay for technology in one of the following ways:

1. The lump-sum payment of a fixed fee made at the beginning of the operation;

2. Payment of a predetermined fee to be remitted over an agreed number of periodic instalments;

3. Royalties on the value of sales;

4. Royalties on the number of units sold or produced;

5. Payment of an initial fee and royalties on sales or quantities;

6. Periodic fixed fee plus royalties on sales or quantities whenever such sales or quantities exceed previously agreed lower limits;

7. Payment of an initial fee plus a fixed periodic fee plus royalties on sales or quantities after these reach a certain level.

Close examination of these methods of payment reveals that they are no more than variants or combinations of two basic principles: the payment of a fee determined in advance, or the payment of a fee which is not determined in advance but is calculated over a period of time in accordance with certain variable factors.

These two basic principles appear alternatively or jointly in the methods of payment listed above, the particular way in which they are applied depending mainly on the licensor's degree of monopoly, the amount of information available to the licensee and the conditions under which he operates, and finally the perception of these conditions by both parties.

Any financial assistance offered to the purchaser by the seller of the technology may also be relevant, as might be the case in methods 2, 6 and 7. By way of illustration, method 2 - the payment of a prearranged fee over an agreed number of periodic instalments - is conceptually identical to method 1, the only difference being that the agreed fee is paid over time and may include an additional amount as interest.1/

Under methods 1 and 2, the licensor enjoys the greatest guarantee of a fixed return for his technology, regardless of the economic success of its application. For his part, the licensee assumes an obligation to the licensor binding him to meet the economic conditions imposed, regardless of how he applies the know-how he has purchased.

This dissociation of the licensor from the commercial success or failure of the technology he sells means that, in the event of success, he receives no further payment over and above the sum initially negotiated.

1/ We shall employ the terms "licensor" and "licensee" even when it might be more accurate to say "buyer" and "seller" or "giver" and "recipient".

In short, the licensor in this case may be said to obtain a guaranteed return whatever the result, in exchange for forfeiting the right to profit from the licensee's skill in economic management. The latter, on the other hand, acquires the right to full enjoyment of his potential economic success in return for the risk of having to pay even in the event of failure.

Conceptually opposite to methods 1 and 2 are methods 3 and 4, which involve straight royalties on either sales or quantities. Although it is true that these methods rarely occur in the form stated, but are usually combined with the first two (vide methods 5, 6 and 7), they are included here in order to clarify the basic issues so that more complex cases may be interpreted.

Straight royalties, whether on sales or quantitities, thus imply a licensor-licensee relationship different from that which arises when a fixed fee is paid.

A graphic representation, using a co-ordinate system, of the behaviour of licensor and licensee might take the form of Figure 1, where the possible royalty levels, in percentages or absolute unit values, are laid off along the axis of abscissas, and the possible total agreed fee values (for example, in dollars) - along the axis of ordinates. The result will be a region of "fixed fee-royalty" points describing the negotiating options available to both parties. Each side's exact negotiating position will depend on its perception of the facts, its capabilities and potential, and its risk and profit preferences, taking into account the implications, for both parties, of the basic methods of payment.

In the case, therefore, of a hypothetical business transaction under consideration between a potential licensor and licensee, each party may be assumed to have its "private" position regarding profit and safety (no-risk) margins, both desirable and objectively possible. Further, assuming that this is true and considering that the two parties are at differing stages of development, probably operate on different scales and rely on different data, each will envisage the transaction in the form of a curve reflecting its preference for a given method of payment according to its assessment of the situation and the variable factors alluded to above.

One may thus imagine a situation in which a potential licensee, for reasons such as ignorance of the technology, the instability of the current economic scene and the relatively limited importance of his enterprise in the market, feels less than

Figure 1. Licensee's preference curve

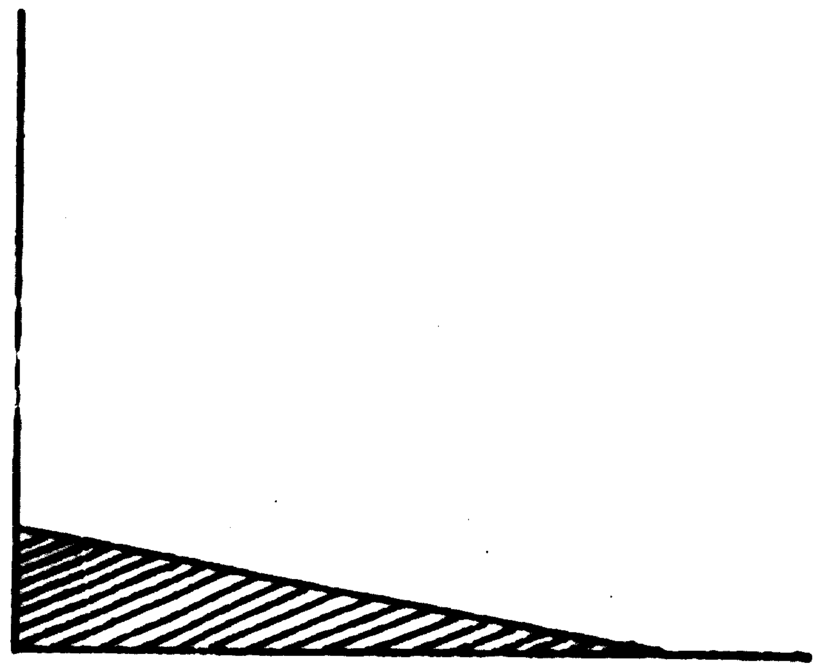
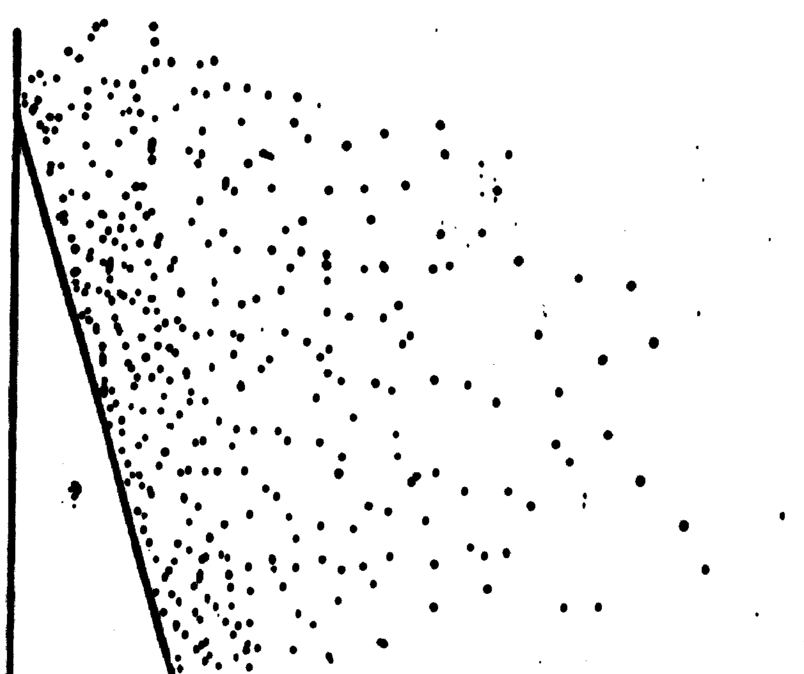


Figure 2. Licensor's preference curve



certain of success. His inclination, on the basis of this subjective evaluation, will be to offer a high royalty figure so as to avoid the need to pay should he fail. On the other hand, he will be willing to pay a fixed fee only if it is so low that its loss, in the event of failure, will not be critical. The curve representing this situation might look like curve pr in Figure 1.

It will be noted that:

1. The licensee will agree to pay a maximum royalty of r per cent or a maximum fixed fee of p dollars if obliged to select a "straight" payment formula;

2. The licensee will agree to any arrangement located on or below his pr curve, which is a reflection of his perception of the market and his place and opportunities in it (shaded area).

Since the licensor also makes his own assessment of the market, the chances of his technology's proving successful and the potential licensee's business acumen, these evaluations will lead him to a preference which is likely to favour the payment of royalties, even if modest, provided he has confidence in the licensee's ability, in the technology itself and in the strength of the market. Under these conditions, the licensor will be willing to make available his specialized knowledge in return for a predetermined fixed fee only if it is high enough to compensate him for the loss of royalties which would in all likelihood become due.

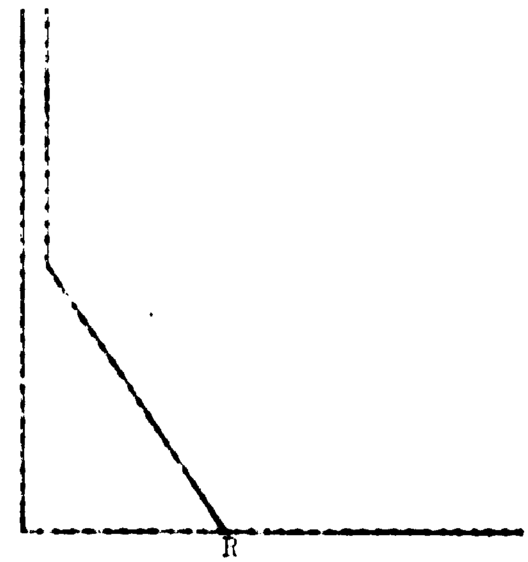
The PR curve in Figure 2 might well describe the kind of licensor preference we have been discussing. It shows that:

1. The smallest fixed fee or lowest royalty the licensor will accept, assuming he agrees to a "straight" payment formula, will be P dollars or R per cent, respectively;

2. The licensor will accept any arrangement located on or above his PR curve, which limits the options acceptable to him in the light of his assessment of the situation (dotted area).

<u>Note</u>: Although for ease of presentation the preference curves have been reproduced as straight lines, this is obviously not their true form. A closer approximation to its real shape would make the licensor's preference curve tend asymptotically

towards the ordinate axis instead of intercepting it at point P, thus reflecting the reluctance of the licensor to forego royalties when the business outlook is good. Further, the licensor may be expected to set himself the goal of a minimum royalty rate, thereby producing an inflection in the curve after which its slope will begin to alter noticeably, finally becoming vertical. This can be seen in the figure to the right.



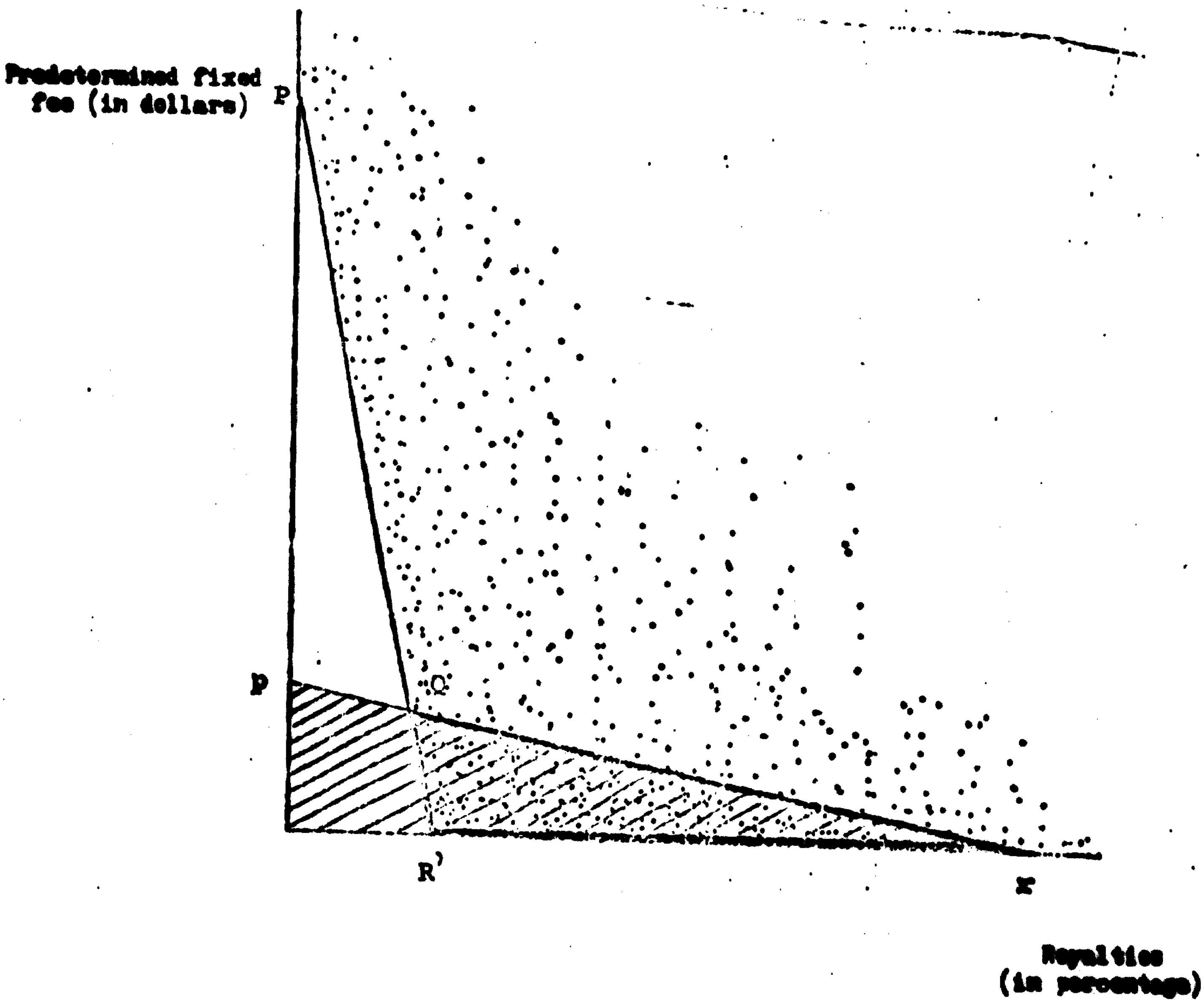
It is worth noting that while attitudes regarding risk and profit may explain why the parties have different preferences for a particular form of payment, these preferences are influenced to a very high degree by the information available to them regarding the market, the technology and one another, and it is this information which is an essential factor in shaping their expectations and thus in determining their preferences as between fixed fees or royalties.

If the preference curves of the potential licensor and licensee are plotted on the same graph, the result will look like Figure 3, about which the following comments are in order:

1. The area of negotiation between licensor and licensee is limited solely to the points contained within the figure rQR, which is obtained by superimposing the alternatives acceptable to both parties. Each of these "possible points", with the exception of those along the axis of abscissas between r and R, represent fixed fee-royalty combinations acceptable to both sides.

2. The "possible points" do not necessarily correspond to equal monetary values for licensor and licensee; neither, consequently, does any one point represent identical degrees of risk for both parties. In short, the points contained within the figure rQR are the expression, in terms of objective and measurable variables (royalties and fixed fees), of the criteria and expectations of the potential parties to the negotiation.

Figure 3. Area of negotiation



This graphic representation brings us back in elliptical fashion to our analysis and discussion of the payment formulae listed above. What we have, therefore, is graphic confirmation that payment methods 5, 6 and 7 are merely combinations of the two basic methods: royalties and fixed fees. Methods 6 and 7 - periodic fixed fee plus royalties, and initial fee plus periodic fixed fee plus royalties, respectively - are financial variations of the possibly no less common method 5 - initial fee plus royalties.

As we have already pointed out, the shape of each party's preference curve will be determined by the expectations of both regarding the performance of the receiving party. Or, to put it differently, we might say that each side's basic attitude at the start of the negotiations is an indicator - sometimes the only one available - of what it expects to gain from the future contract. It would therefore seem useful, if only as a theoretical exercise, to look into the relationship between expectations and negotiating positions.

Basically, two situations are possible with respect to expectations: the expectations of licensor and licensee may either coincide or differ. In the first situation, when the expectations of both parties regarding the licensee's performance coincide, they may agree that the licensee has a high probability of success (case Ss) or a high probability of failure (case Ff). In the second situation, in which expectations differ, the licensor may be confident of the success of the licensee while the latter believes his own likelihood of success to be small (case Sf), or else, conversely, the licensee may regard his probability of success as high while the licensor thinks otherwise (case Fs).

In case Ss, the essential elements in the attitudes of licensor and licensee are expressed graphically in Figures 4.1 and 4.2 and may be summarized as follows:

1. The licensor is willing to accept low royalty payments in order to gain a share in a potentially successful venture. Conversely, if he is obliged to accept a fixed fee, he will do so only if it is large enough to compensate him for not sharing in a possible success.

2. The licensee would accept low or zero royalty payments in order to keep for himself the profits of a possibly successful venture. If obliged to pay a fixed fee, he would accept a high one in order to avoid the payment of royalties.

If the curves are assumed to take the form of straight lines, two possibilities can be represented:

1. The licensee's expectations are slightly more favourable than the licensor's (Figure 4.1);

2. The licensee's expectations, although good, are slightly less favourable than the licensor's (Figure 4.2).

In the first case (Figure 4.1), the area of coincidence will be that described by the figure rQR, representing the set of "fixed fee-royalty" combinations in which the royalty amounts are lower than those in the first situation.

What is important in this case is that the royalty and fixed-fee levels are determined not on the basis of the "absolute" expectations of both parties, but primarily as a result of a comparison between the potential partners' expectations. Although many different variables are responsible for determining the exact bargaining terms, it will be noted that this theoretical case is based on negotiations between two soundly based enterprises, this being particularly evident in the case of the licensee. In this event, minor differences in information and/or expectations can shift the negotiations from area PQp to rQR, or vice versa, resulting in significant economic differences over the short and long term

In case Ff, where both parties' expectations are "pessimistic" regarding the project, the attitudes will be as follows:

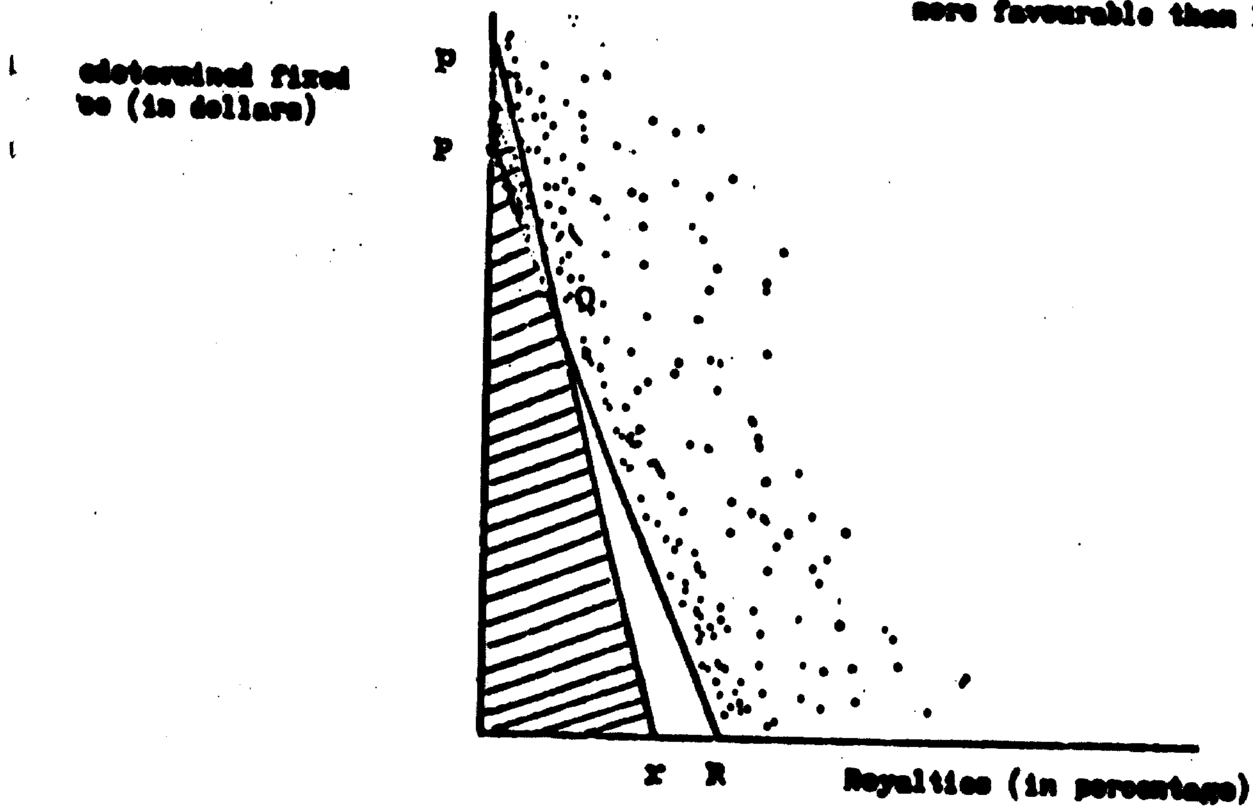
1. The licensor will prefer even a small fixed fee in order to guarantee himself a minimum return in the event of failure. If obliged to accept a royalty arrangement, he will do so only if it is high enough to ensure him some return in the event of very poor sales.

2. The licensee will prefer to pay high royalties rather than a fixed fee, in order to avoid costs in the event of failure. He will accept a fixed fee only if it is low and would not represent a serious burden in the event of failure.

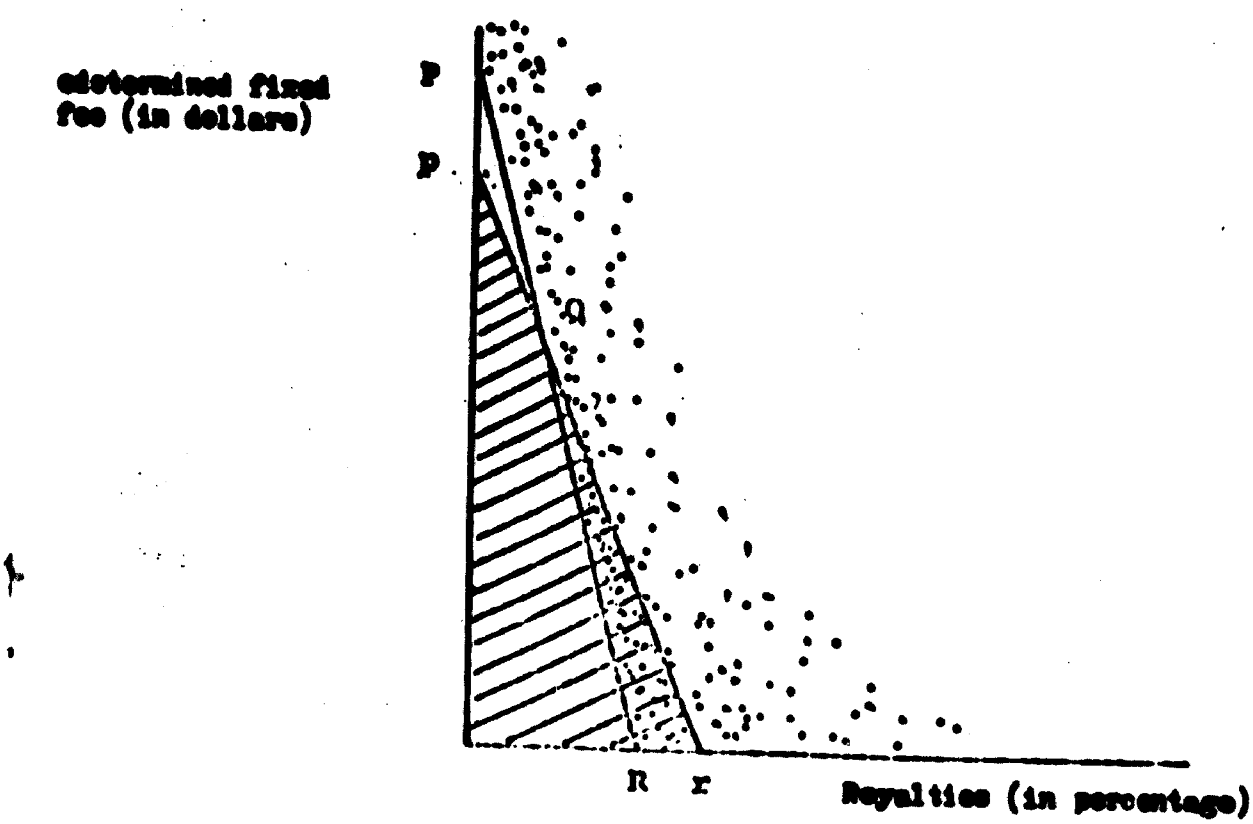
This case is typical of high-risk projects and once again demonstrates the importance of the "relative expectations" of each party (Figures 5.1 and 5.2), which give rise to as many different possibilities as in the case Ss. If, given a pessimistic

Figure 4. Case 2a

4.1. Licensee's expectations slightly more favourable than licensor's



4.2. Licensee's expectations slightly less favourable than licensor's



outlook on both sides, the licensee's expectations are slightly more favourable than the licensor's (Figure 5.1), the area of coincidence will be located in PQp. If, on the other hand, the expectations of the licensee are relatively less favourable than those of the licensor, the area of coincidence will be located in rQR (Figure 5.2).

The numerical magnitudes resulting from either situation will obviously differ, although a point worth mentioning is that, where the project proves successful, an agreement in the area rQR will tend to cost more than one in the area PQp, something that is also true in the case Ss.

If, for lack of information, for example, the licensee takes the attitude represented in Figure 5.2, but later achieves success, the economic burden of the royalties will be much greater than it would have been if he had assessed the situation more accurately.

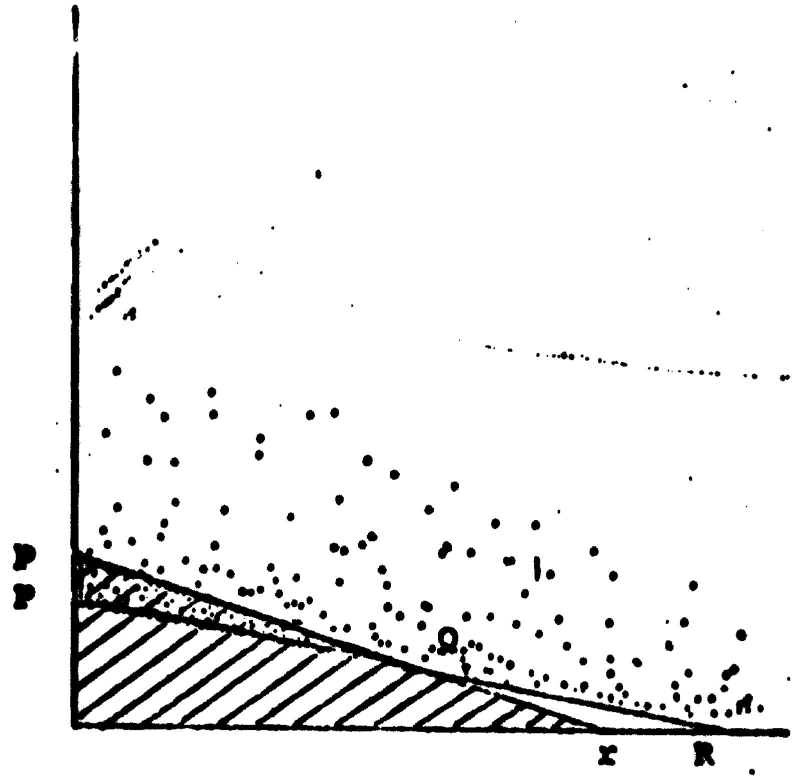
It is quite obvious, of course, that firms operating in the business world are forever being confronted with options and "dangers" of the type discussed above, and it is almost superfluous to call attention to them. Nevertheless, the quality of the information which the licensor can pass on to the licensee plays a key role here. Generally speaking, the technical know-how on the market is of proved production efficiency, and if the licensee has been properly informed as to what is involved and required, his starting position will be greatly improved. The licensor, however, will resist making this information available. Expressing this in terms of Figures 5.1 and 5.2, it might be said to be equivalent to shifting the negotiations from rQR to PQp, which over the long term is to the economic disadvantage of the licensor. This explains why, as in the case Ss, measures to encourage the prior release of information are so necessary, along with assistance in obtaining information on market opportunities and on the usual negotiating conditions in the area of activity under consideration.

The first case in which the expectations of the two potential contracting parties differ is when the licensor is confident of the economic success of the licensee, while the licensee himself believes that such success is far less probable (case Sf).

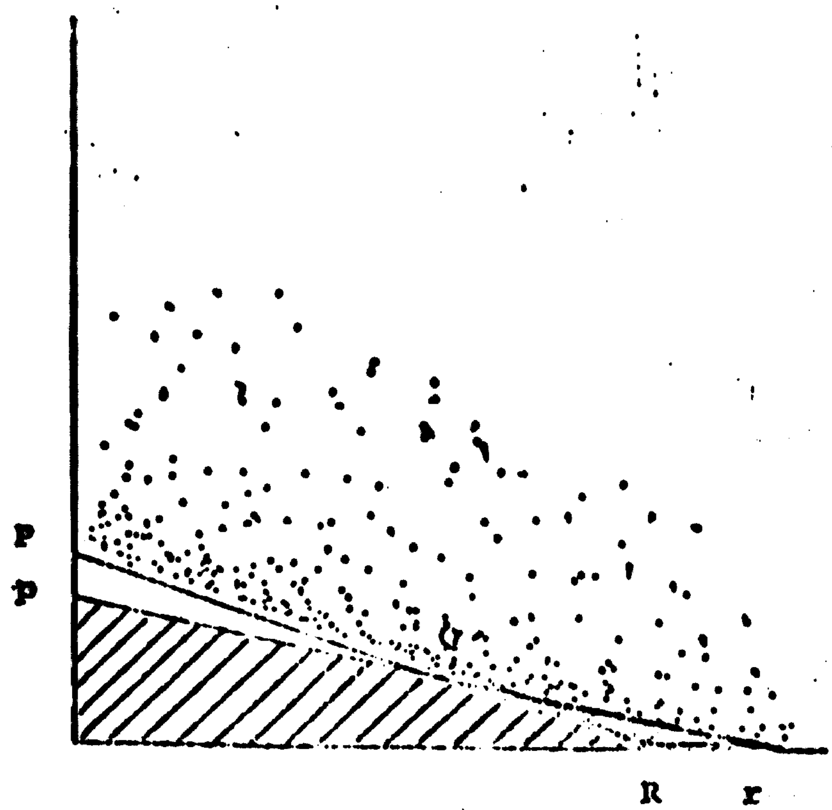
In effect, this situation represents a combination of the expectations attributed to the licensor in case Ss and those attributed to the licensee in case Ff. It is represented in Figure 6, in which the licensor attempts to secure royalty payments, even though small, and will accept a fixed fee only if it is sufficiently high.

Figure 5. Case IX

5.1. Licensee's expectations slightly more favourable than licensor's



5.2. Licensee's expectations slightly less favourable than licensor's



The licensee, rather than commit himself to a fixed fee, will prefer to make high royalty payments. The appropriate curves are thus PR and pr respectively, which will be more or less steep to the extent that licensor and licensee feel confident in their expectations, favourable in the case of the former, unfavourable in the case of the latter.

It is clear that the area of negotiation will be RQr and that the probability of the agreement's including high royalties will depend, among other factors, on the licensor's ability to detect the uncertainty of the licensee as evidenced by his willingness to accept royalty obligations as high as r.

In practice, this case is typical of situations involving projects whose aim is to introduce a totally new product to the market of the potential licensee. In such a situation, the licensee, because of his uncertainty regarding acceptance of the product, the sales costs he will incur and the problems he will have to face, will tend to reveal his thinking in the form of a curve similar to pr in Figure 6.

In this case, the strengthening of the licensee's negotiating position depends essentially on his ability to evaluate his chances of success, and to do this he must have access to information which the licensor is almost certain to possess. This process of improving one's negotiating stance could be described as an effort to transform curve pr of Figure 6 into curve pr of Figure 4.1 and, possibly, 4.2.

The obverse of the previous case is that involving a licensor who lacks confidence in the success of the licensee, while the latter firmly believes in it. Following the same line of reasoning as before, we may assume that this situation can be graphically represented by Figure 7, in which the area of negotiation is PQp. In this case, the royalties finally agreed upon might be zero, while the fixed fee - minimum for the licensor and maximum for the licensee - would correspond to the ordinate at point Q, the value of which would obviously fall with a decline in the expectations of the licensor.

Since the curve representing the licensor's position tends to grow steeper as his expectations rise, with the licensee's curve behaving similarly, graphic analysis makes it clear that, ultimately, the more realistic the licensee's expectations (which wholly determine the course of the negotiations), the more economic will the final agreements be in the event of success. It is true to say that factual considerations, such as the licensee's capacity, the appropriateness of the technology and even the opportunities of the market, will affect the final agreement only to the degree that these variables are reflected in the expectations of the two sides.

Figure 6. Case [illegible]

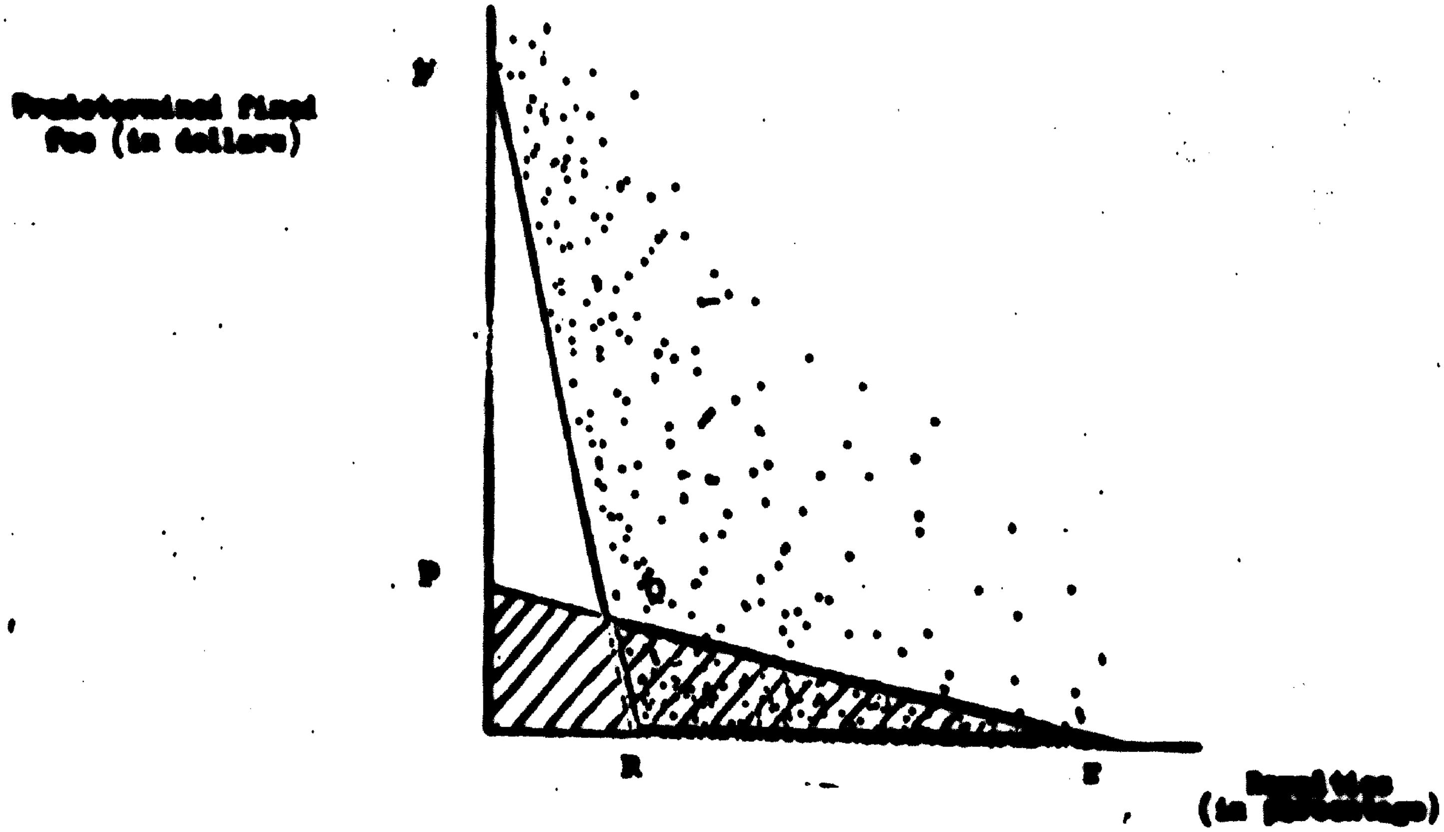
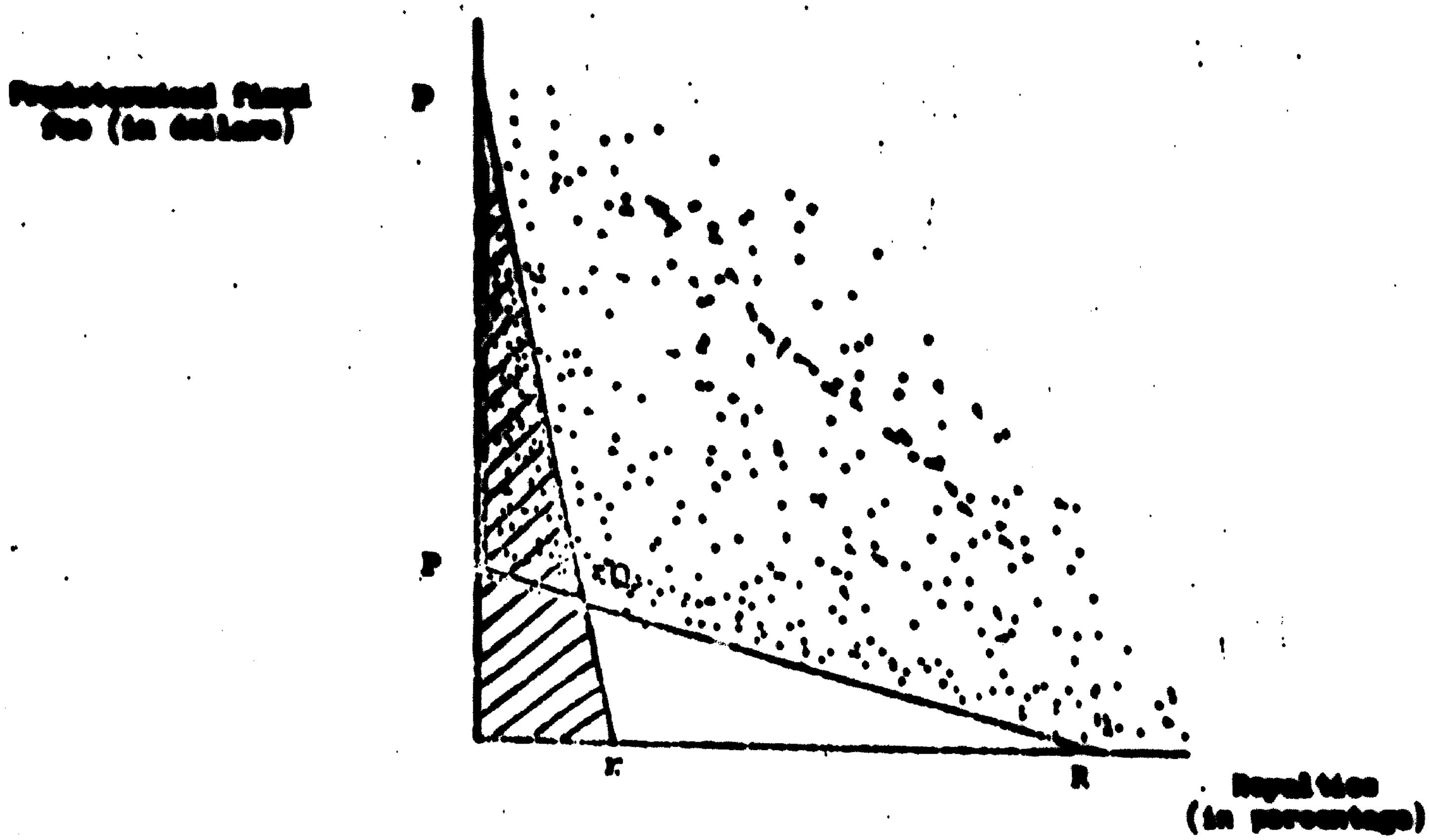


Figure [illegible]. Case [illegible]



The schematic approach described above may also provide a partial explanation of the clear preference shown by licensees for royalties as a payment formula, since this method involves the least financial risk in the event of failure. There is a basic discrepancy between the positions of the licensor and the licensee which arises out of the different economic risks they face when undertaking a project. The former, the licensor, risks a loss of profit over a limited period of time, which usually means that, should the project not be realized, he will be unable to take it up again later. The licensee, on the other hand, has to consider the investments which he has made, or will make in connexion with the project, as well as the profits he hopes to realize from them - profits which are normally not incidental to his principal operation, as is customarily true in the case of the licensor, but on which may depend the entire future of his firm.

One result of the licensee's lesser relative capacity to take risks is that he is often obliged to accept methods of payment, such as royalties, which prove more expensive in the long run. In the analysis given above we have indicated, for each set of circumstances, the licensor's possible response in the light of his expectations, which, precisely because he is a seller of technology ... and experience, are frequently closer to reality.

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