Unit 18

TITLE: INTRODUCTION TO TECHNOLOGY VALUE AND PRICING ISSUES

PURPOSE: Explicit or implicit judgments are made about value and price in negotiating licenses. By determining what constitutes "value," the link between value and price can be established. The purpose of this unit is to make clear the distinctions between value and price and to provide insight into the pricing process.

OBJECTIVES: Upon completion of this unit, participants will:

- Have been introduced to the concepts of value and price
- Have an understanding of the elements of a technology that constitute value
- Understand who values technology
- Understand the major factors that affect price
- Understand the role of technology transfer objectives in pricing Federal laboratory technology
- Have reviewed an example of a royalty rate calculation.

MATERIALS:

Transparency 18-1: Introduction to Technology Value and Pricing Issues

Transparency 18-2: External Sources of Technology

Transparency 18-3: Licensing to the Private Sector

Transparency 18-4: Value Is. . .

Transparency 18-5: Value Is In the "Eye of the Beholder"

Transparency 18-6: Evidence of Value in a Technology

Transparency 18-7: Who Values Technology?

Transparency 18-8: Pricing Technology Transfers

Transparency 18-9: Pricing "Technology"

Transparency 18-10: Cost Structure of Industrial Innovation

Transparency 18-11: Federal Laboratories' Constraints on Pricing

Transparency 18-12: Dimensions of Price

Transparency 18-13: The 25 Percent Rule

Transparency 18-14: Calculating Royalty Rates: An Example of the 25 Percent Rule

REQUIRED READING:

Tom Arnold and Tim Headley, "Factors in Pricing Technology Licenses," Les Nouvelles, Vol. 22, No. 1, March 1987, pages 18-22.

OPTIONAL READING:

Robert Goldscheider, Technology Management Handbook, Clark Boardman, New York, 1984, pages 103-121.

NOTES TO INSTRUCTOR:

1. This unit provides an overview of some important issues and concepts used in valuing and pricing technology for transfer. Most of the literature pertains to pricing technology in transfers between firms. Federal laboratories attach a public nonmonetary value to technology that is not generally present in transfers between private sector firms. There is no reliable method for quantifying the public good aspects of the technology in determining price. Public good benefits will need to be a matter of judgment until enough experience is gained to provide some guidelines.

2. This unit deals with valuing patented or patentable materials and does not address the problem of how technology as knowhow would be valued in setting up a cooperative research arrangement in which the private sector seeks access to the expertise of laboratory personnel. This is an issue that each laboratory is in a position to best determine for itself.

3. The required and optional reading materials for this unit contain several "checklists" that may be useful to laboratory personnel engaged in pricing technology. Goldscheider's Technology Management Handbook also contains an appendix with 28 examples of licensing forms.

ESTIMATED TIME:

30 minutes for presentation
45 minutes with discussion

Unit 18

INTRODUCTION TO TECHNOLOGY VALUE AND PRICING ISSUES

Transparency 18-1: Introduction to Technology Value and Pricing Issues

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INTRODUCTION

There is a growing recognition in the United States that the key to innovation, industrial growth, and competitiveness lies in the ability to use technology to create marketable products. It is also recognized that it is not always necessary for an individual firm to develop the technology that it uses to create its final products or technology-based services. The Japanese have taught this lesson well by acquiring U.S. technology and successfully incorporating that technology into products that appeal to end users (particularly in consumer markets) in quality and price. Thus, the acquisition of technology from sources external to the firm is a strategy of increasing importance to U.S. firms.

Transparency 18-2: External Sources of Technology

There are many sources of technology for firms. For example, a firm can acquire technology from:

- Individuals (e.g., inventors)
- Private sector firms
- Public institutions (e.g., universities and Federal laboratories).

Thus, there is a growing market for technology in the private sector, with many firms engaged in buying and/or selling technology.

Transparency 18-3: Licensing to the Private Sector

NOTE: THE INSTRUCTOR SHOULD REVIEW UNIT 17 (MARKETING TECHNOLOGY).

This unit is concerned with a particular class of technology transfer--licensing to the private sector. Once a technology with commercial potential has been identified, the marketing effort (i.e., finding a receptive user and commercializer of the laboratory's technology) begins.

As the laboratory's marketing strategy develops, indicating that licensing is the appropriate mechanism for transfer, the valuation and pricing of the technology become of central importance and concern to both the seller (i.e., the Federal laboratory) and the potential buyer(s).

NOTE: PRESENT PURPOSE AND OBJECTIVES OF THIS UNIT.

The first important point is that there are two elements under discussion: value and pricing. The terms are often confused; they are related, but they are not at all the same thing. First of all, the perceived value may be different for both parties, but it is determined by the buyer. A price is asked by the seller, but set by the buyer. The price a buyer is willing to pay is determined by the value of the specific technology to the firm in a particular market (i.e., the firm's customers).

VALUING TECHNOLOGY

Let's talk about value. What is value? Why are we interested in it? And, how do we determine a technology's value?

The Nature of Value

Transparency 18-4: Value Is. . .

First, what is value? We might define value as the estimated worth of something, in this case, technology. This definition implies money and leads people to confuse value with price. Actually, the value of a technology to a firm is that it presents an opportunity to commercialize the technology, and thereby to enhance the firm's competitive position and in turn to earn profits and to grow.

It is obvious that value (or worth) and price are not identical when we consider a simple hypothetical case.

Assume a laboratory technology is available for licensing. Two competing companies are approached. Company A is strongly established in the market and ready to introduce a new product line based on similar, but patented technology. Company B is also firmly established, but knows that its market share is in jeopardy because of Company A's new product line. To Company A, the laboratory's technology presents not an opportunity but a threat to its new product line. To Company B, the technology presents a concrete opportunity to maintain or expand market share, remain competitive, enhance its competitive position, and earn profits.

There is no inherent value in the technology to Company A, and theoretically it is worth nothing to the company. It is potentially of great value to Company B. However, both may be interested and willing to pay a price for controlling the technology. The reason is obvious. Company A, as a strategic defense, may be willing to pay a price to keep the technology from being commercialized. The value to Company B rests not on the price, but on the opportunity it represents.

DO THE PARTICIPANTS HAVE ANY COMMENTS ON THE EXAMPLE?

Importance of Valuing

The second question is: Why are we interested in value? Considering value as an opportunity rather than a price has the major advantage of alerting us to the fact that value is in the "eye of the beholder." This is important because it focuses us immediately on several critical elements in transferring technology for commercialization.

Transparency 18-5: Value Is In The "Eye of The Beholder"

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1. We are focused on understanding the incentives and disencentives for commercialization by determining the value of a particular technology to a particular firm operating in a particular market and also its value to the Federal laboratory.

2. This process helps to evaluate potential transferees.

3. Understanding the value to each firm helps to establish the price of the technology.

One thing we notice right away is that a technology's value for Federal laboratories acting as sellers does not correspond to the value from the buyer's (i.e., a firm's) perspective. In the case of private sector firms selling technology, profit can be earned on technology-embodied products marketed by the firm and secondly from the licensing of the technology to other firms for use in different applications. Sometimes a firm can even license a process technology to other competing firms.

The understanding of value as a context grounded in an opportunity to earn profits is very beneficial for private sector firms in that it provides a common purpose for the transaction. "Win-win" situations can be structured because there is common ground. Value can be established by considering potential profits for both parties.

For a Federal laboratory acting as seller to a private sector firm, the situation is altered by the lack of a profit motive on the part of the seller. Here, the common ground shifts from both buyer and seller being interested in achieving profits to both parties being interested in an opportunity.

The opportunity for the Federal laboratory is to contribute to the creation of public goods by enhancing innovation and U.S. competitiveness in international markets, thereby increasing economic activity and growth and creating new jobs and possibly even new industries. The value for Federal laboratories is more appropriately estimated in terms of the social and economic benefits derived from exploiting the opportunity (i.e., the technology).

Nevertheless, there is a congruence of purpose that allows "win-win" situations; that is, the opportunity presented by the technology cannot be realized by either party unless the technology is actually commercialized. Commercialization achieves both parties' goals even though they are different. This is a "win-win" situation.

DO THE PARTICIPANTS UNDERSTAND HOW THE MOTIVES FOR FEDERAL LABORATORY TRANSFER DIFFER FROM TRANSFER IN THE PRIVATE SECTOR? WHAT IMPLICATIONS DO THE PARTICIPANTS THINK THIS DIFFERENCE HAS FOR LABORATORY VALUING OF TECHNOLOGY AND FOR LABORATORY TECHNOLOGY TRANSFER ACTIVITIES?

Establishing Value

The third question is: How do we establish value?

Establishing the value of a technology is accomplished by showing the other party in the transaction that the perceived opportunity can be exploited for mutual benefit. This necessarily requires that each party have some reasonable idea of the value (i.e., the size and the extent of the opportunity) as defined by the other party. For example, the Federal laboratory must show some evidence of the ability of the buyer (the firm) to earn profits from commercializing the technology. The firm must show the laboratory that it has the ability to commercialize the technology so that the technology's value (i.e., as a public good) from the laboratory's perspective can be realized. Different information is required from each of the parties to establish value and subsequently to arrive at a proper price.

Evidence of Value

When a laboratory approaches or is approached by a firm(s), what evidence can be presented that will establish value in the "eye of the buyer?" The evidence must be targeted to indicate that the firm has an opportunity to earn profits by commercializing the lab's technology. Here are a few examples of the types of evidence that are usually acceptable.

Transparency 18-6: Evidence of Value in a Technology

Patents by themselves do not automatically produce profits, and the absence of patents does not mean the technology has no value. A patent helps to establish the technology's novelty and level of protection from competition. Patents and knowhow indicate the

developer's ability to create technology, make it work, and a willingness to transfer.

A preliminary market analysis generally estimates the size of the commercial opportunity in terms of potential sales and market share (of the firm). It indicates the value to the buyer and is used by both parties to arrive at a price.

Estimates of cost savings to be achieved by process technology is strong evidence of value because process costs directly affect profits. Also, value is derived if the new technology provides a more plentiful or cheaper alternative to existing materials used by the firm(s). Helping a firm to meet a regulatory requirement also contributes to value.

It is worth noting that of this list (and it is not exhaustive), patents are of primary interest when the potential buyer is a single firm interested in an exclusive license or several firms interested in different geographical regions or different uses (i.e., applications). If the value of the technology is derived from reducing process costs, scare materials relief, or meeting regulatory requirements, the technology may be marketed to many or all of the firms in a particular industry.

Evidence of knowhow is important in all cases because it is of value even in transfers involving patents.

WHO VALUES TECHNOLOGY?

Transparency 18-7: Who Values Technology?

Now let us consider the parties: who places a value on technology? The licensor or transferor laboratory places a value on the technology when that technology is priced initially.

There is a powerful mix, both in the public and private sectors, of objective and subjective elements when value is being attributed to anything that doesn't have a relatively free market test. So there is a lot of emotion as well as calculation involved for the orignator of the technology. The licensor must be aware that the danger of being "in love" with the technology often results in an inflated view of its

value. In this case, the price will be set too high to allow a buyer to commercialize it and to make a sufficient return on his investment.

Licensees or transferees obviously get involved in setting the value, because it has something to do with what they will pay. Generally, private sector firms try to establish the present value of the profits that they expect to flow from exploitation of the technology.

And where does that lead? It leads to a general inclination on the part of the licensee to pay for the technology as much as possible in the form of royalties. Royalties are related to profits. If commercialization of the technology is successful, they don't mind so much paying out money. And if it doesn't succeed, they don't want to be saddled with a liability by having paid for a technology that does not achieve profitable results.

Third parties include consultants and professional transfer agents. Sometimes legislators and competitors of the transferee can be expected to get involved.

The competitors of transferees will have something to say about what a technology that you have is worth, but after the fact. For example, the lab licenses Company A, which produces a product out of that technology that does very well in the market. Company B, also a U.S. firm, may claim that it didn't have an opportunity to license the technology competitively.

So the competitors of transferees are going to complain (probably to a Congressman) if you put a technology in the hands of one of their competitors. Does this mean the lab must go out broadly to make sure every possible competitor in a marketplace is aware of the technology? There should be competition in the marketplace for the technology. However, if there are 13 companies that are potential competitors in this market, it will be expensive and time consuming to have extensive discussions with all of them. If the lab technology is most appropriately commercialized by exclusive licensing, discussions with all of the potential competitors simultaneously may prevent the licensing of the technology. Only time and experience will tell if this is going to be a problem.

And, of course, in the end, the marketplace values technology. In the final analysis, that's where the valuation is done. That only happens if the marketplace is actually given a chance to work. What do we mean by given a chance to work? It means several things. The first step is to recognize that there is a market for the technology, and that means getting two, three, or four people to compete for the technology, where possible. That may be enough competition to establish the value to the market.

But there are other levels of markets that the potential transferees need to consider. For example, the market for the products and services produced with the technology must be considered. In setting a reasonable price for the technology to the private sector firm, the laboratory would certainly need to make some estimate of what kind of profits the technology will generate for the licensee and then establish the price for the technology based on sharing some of that benefit.

It may be that government labs will trade off some of the conventional income dollar form of value for social benefit; but it is important to know that it is a tradeoff because the lab wants to get the top value that it can, however that value is manifest--as income, as public social and economic benefits, or even as a demonstration to Congress that the lab is meeting its mandated responsibilities in technology transfer.

HOW DO THE PARTICIPANTS RATE THE RELEVANT WEIGHT OF THE THREE FACTORS (INCOME, PUBLIC GOOD, AND LABORATORY GOOD) THAT MUST BE TAKEN INTO CONSIDERATION BY A FEDERAL LABORATORY IN VALUING ITS TECHNOLOGY?

PRICING TECHNOLOGY

Transparency 18-8: Pricing Technology Transfers

We have talked a good deal about value. Let's shift over now and talk a bit about pricing.

What do we mean by the "price" for the technology? Price is simply the compensation the buyer gives to the seller in exchange for

the right to use the seller's technology in products the firm intends to sell or in the process that would be used to manufacture its products. The opportunity to the buyer is that the new technology may increase its profits, but there is also a risk that it may result in a loss.

From the buyer's perspective, the price of the technology--the compensation to the laboratory--is a cost. And this cost must achieve a balance between the perceived opportunity (of profits) and the risk of loss. From the seller's (i.e., Federal laboratory's) perspective, the price represents an opportunity to achieve social benefits which are difficult to quantify. It also produces income. In arriving at an acceptable price to both parties, a balance of objectives must be reached.

Determining Price

Transparency 18-9: Pricing "Technology"

Determining the price is the central focus of negotiating licenses. Do you think the pricing of technology is an art or a science? Many believe the pricing of technology for transfer is a simple matter, whether it be through a license or outright sale of technology. As we proceed, I think you well agree that it is much more art than science, although there are scientific elements that must be incorporated.

There are several theories about how a technology "should" be priced. Most of the theories don't hold up across any very broad spectrum of technology.

NOTE: SEE READINGS FOR THIS UNIT FOR A CLARIFICATION OF THIS POINT.

One of the theories is that the price should directly reflect the cost of generating the technology. Once again, the concept of value and the concept of cost are very different. There is a general propensity in government to equate cost with value.

It may cost 20 cents to buy a washer that is needed by the B-1 bomber sitting on the ground, but without that 20-cent washer, the B-1 can't fly its mission. Or, an individual working in a laboratory may, in a flash of inspiration at 2:00 a.m., conceive a technology, and there is no official cost on the books. Or, a guy wakes up, thinks of something, writes it down. The next day, he spends 27 minutes in the lab and comes up with something that becomes the basis for an important innovation. The cost was minimal, probably represented on the books of account as zero; but the value could be enormous to an innovative firm as profits or to the laboratory in terms of public benefits.

It's value that is important in pricing technology. The twist is that in highly competitive markets, prices tend to reflect costs, not value. Fortunately, in technology markets, there is relatively limited competition for a particular technology. Other people haven't come up with that result. In this case, a value method rather than a cost measure should be used for pricing.

A variation of the cost theory is setting a price based on what it would cost the buyer to get to the same point. In other words, if the buyer had to do the R&D to produce this technological possibility, that is the price. This is not a very practical approach because a firm may well argue that these are "sunk costs," particularly if the technology has come out of mission work. In other words, the government would have spent the funds anyway to achieve its own purposes. The technology is a "spin-off" of the main work, and the benefit the government reserves for its R&D investment is realized in the primary mission work.

There is no use arguing that the technology has an "inherent value;" that is, that without the technology, the buyer could not commercialize anything and achieve profits. That is true, but the laboratory cannot achieve its objectives unless some firm is willing to assume the risk for commercializing it. What is relevant to the firm is the future profits the technology may generate.

In negotiating a price, the parties are trying to reach a compromise, trying to come to a decision at a point that is close to the maximum ignorance of both parties. What are they ignorant of? The

seller can't say too much about the technology without giving it away, and the buyer isn't going to say very much about plans for exploiting the technology, fearing the price will go up because the value (i.e., market potential) is greater than the seller expected.

So the parties bargain in ignorance of what each other is thinking. The price emerges from the bargaining process, with values being derived on both sides in the dimensions that count to the two sides.

Boundaries

What is being sold? What is being priced? By now we know it is the value growing out of the opportunity. But to this value, it is necessary to specify boundaries on the sale of the technology. The boundaries typically include a geographical territory. For example, the rights are granted to exploit it in North America, or the United States. It may be worldwide rights (subject to national security defense constraints).

Another boundary is the end uses of the technology. It is not necessary to give away, or to license, or to sell the full spectrum of end uses of the technology in the very first bargain for its use. For example, suppose the laboratory is negotiating a transaction for the exploitation of technology that appears to be the best explosives detection technology ever developed. The technology may have uses far beyond explosives detection (e.g., the medical field, nondestructive testing). But the potential licensee's interest and capabilities are only applicable for the explosion detection end use. The buyer doesn't get any of the other end uses. Those are reserved to the laboratory that developed the technology and has it for sale. For the laboratory to license the buyer in this case for all applications would mean the technology's full market potential probably could not be achieved. A major opportunity (i.e., a major part of the technology's value to the lab) would be lost by limiting diffusion of the technology.

So end use does not necessarily mean licensing all end uses to one buyer, and the number of end uses that are included influence the price. If the buyer wants all the end uses, the asking price would

multiply. The price is different for the explosives detection end use than it is for all end uses.

Market position is also a boundary of the technology. What is market position? It's best characterized by the degree of exclusivity that is granted with the license. The U.S. government limits full exclusivity. Exclusivity means that only one firm can exploit the technology for a particular use. But, the government maintains the right of royalty-free use. If the government is also a market for the buyer, this limitation will affect the price. The buyer of the technology is going to bargain for a lower price.

This is also the case with march-in rights when the government is a customer. This means the government can give a license to somebody else if the firm won't charge the government what the government thinks is a fair price for the product that is an outgrowth of the technology. Also, if the firm is not commercializing the technology according to its plan, the government can license the technology to other firms. The government has rarely exercised its march-in rights, and there is not any evidence that the government is more likely to exercise march-in rights now than in the past. But, it is an issue that ought to be considered. A laboratory cannot give full exclusivity (as the private sector thinks about exclusivity) in some cases.

The time frame, or the duration of the license, is a very important boundary in negotiating the license. Generally, the time frame must be long enough for the buyer to accrue sufficient profits to justify his investment in the technology. The development cost plus the marketing cost are important to the buyer. The firm needs a long enough time to exploit the technology in some protected fashion in as much territory as possible and for as many end uses that are relevant to the firm's interest and capabilities. Time is a major factor in the buyer's ability to capitalize on the opportunity the technology represents.

At the end of a period of time in which the laboratory derives benefits from the firm's commercialization efforts, the buyer usually expects to have a fully paid up license where the firm owns the technology. In the private sector, those periods are variable,

but average 10 to 12 years.

The Cost of Innovation

Transparency 18-10: Cost Structure of Industrial Innovation

In establishing a price, it is important to keep in mind something of the nature of the cost structure of the typical industrial innovation. Careful analyses of many industrial innovations in free-market nations support the conclusion that, in general, the R&D phase of the innovation process accounts for about 10 percent of the total resources required to get an innovative product or service to the market (i.e., to the end users, the firm's customers). Technology delivery--the production and marketing phases together--require the other 90 percent.

The point is that in technology transfer, the buyer (i.e., the firm) must look at the transaction in terms of his total cost. When the buyer calculates return on investment, the total investment (including what he must pay for the license) is the appropriate measure. Keeping in mind that the buyer must realize a return on his investment and getting an idea of what that total investment might be is essential in arriving at the "right price."

NOTE: THE 10 PERCENT/90 PERCENT SPLIT IS A HANDY MEANS FOR ENCOURAGING THE INSTITUTION THAT CREATES A TECHNOLOGY NOT TO OVERPRICE. IT DOES NOT, OF COURSE, APPLY TO EVERY CIRCUMSTANCE. IF ANYTHING, THE RELATIVE PERCENTAGES WOULD GENERALLY BE EVEN WIDER FOR FEDERAL LABORATORY TECHNOLOGIES THAT HAVE NOT PROCEEDED THROUGH THE DEVELOPMENT STAGE. WHAT DO THE PARTICIPANTS THINK ABOUT THE PERCENTAGES AND THEIR IMPLICATIONS FOR TRANSFER ACTIVITIES?

Constraints on Pricing

Transparency 18-11: Federal Laboratories' Constraints on Pricing

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We should also consider the constraints affecting pricing of technologies originated at Federal laboratories. The laboratory should consider net social benefits. Social benefits are a valid consideration for government, though they are not generally taken into consideration by the private sector in establishing value.

There are many nonmonetary elements of value, and, therefore, there are many elements of value that a public sector entity can realize from moving technology to the private sector. Elements such as firm creation, job creation, industrial growth, U.S. competitiveness, industrial diversification, and others have local, regional, and national benefits. This type of value cannot be quantified precisely, particularly in the pricing phase of the transfer.

This raises the question: How then is the laboratory (i.e., the seller) to arrive at an adequate conception of the value of its technology when public good issues must be taken into consideration in establishing a fair price? There is no clean-cut, simple formula to use as a guide in this area.

One thing that the laboratory can use is the commercialization plan. If a government-owned technology is up for license, interested firms are required to submit a commercialization plan. This is the applicant's plan for developing and marketing the technology-based product, process, or service. It details the time required, the amount of capital and other resources the applicant believes will be necessary to commercialize the technology, and the applicant's intentions and capabilities with respect to manufacturing, marketing, financial, and technical resources. The requested fields of use and geographic areas where manufacturing and sales will occur are also required. The license application will also include the type of license requested, number of employees, and firm status (e.g., small business).

This information can form the basis of an evaluation of the firm's situation and the effect of this firm licensing the laboratory

technology. For example, if a new company is being formed to commercialize the technology, this is a direct social and economic benefit in terms of firm creation. Also, new employees (the plan should specify how many) will be hired, thus contributing to job creation. A firm may be in competition with Japanese or other foreign competitors, and this technology would strengthen its competitive position, thus contributing to U.S. competitiveness.

There are many other possible circumstances in which the technology may support public good objectives, which is the primary value for the government. The commercialization plan and conversations with the applicants should reveal the overall situation. Although these factors cannot be "plugged in" to a formula for pricing, they can be considered and weighed in the evaluation process according to the laboratory's own objectives. In any case, the laboratory should make a concerted effort to follow up on these effects to use as documentation of the laboratory's total contribution to innovation and U.S. competitiveness.

Assuming that a Federal lab negotiates with the private sector in a domestic-only transfer (that is, the technology will only be commercialized by U.S. firms), does it matter if it's priced too low? If the lab gets less than the full potential market value in its negotiations and the technology is going to a domestic market, it probably doesn't matter all that much from a public perspective because of the social benefits that will be derived from commercialization.

However, if the price is too low, competitors of transferees could create political problems because of a competitive disadvantage they may suffer. They can claim that because the lab sold the technology too cheap, they have been placed at a competitive disadvantage.

A defense is needed. The textbook solution might well be to license everybody who seeks a license. However, this is not a good policy. Many technologies require exclusivity to achieve a sufficient return on investment. There are economies of scale and increased productivity to be achieved by dealing in large markets, and market size will be critical in determining if exclusivity is the best approach.

The lack of full exclusivity we have referred to is a constraint, since buyers can be expected to press for lower prices under these circumstances. It is the lab's job to bargain hard and get a price that the lab can live with.

No one knows where the issue of international transfers will end up. There are many tough calls that are going to have to be made related to national security and also to national comparative advantage and to the export of jobs. The problem is particularly complicated because many large firms have international operations, and a "foreign" company may have facilities in the United States that provide many jobs. These are issues that must be resolved in the future, but ones that we should be aware of and sensitive to, even if we can't yet adequately address them.

DO THE PARTICIPANTS THINK THAT A LABORATORY WILL HAVE FULFILLED ITS MANDATE FOR TECHNOLOGY TRANSFER IF IT GIVES AWAY TECHNOLOGY? HOW DO THE PARTICIPANTS THINK SUCH AN APPROACH WOULD AFFECT TRANSFER INCENTIVES? DO THE PARTICIPANTS THINK THAT IT IS ADVISABLE FOR THE LABS TO AIM AT THE HIGHEST PRICE THEY CAN GET?

DIMENSIONS OF PRICE

Transparency 18-12: Dimensions of Price

There are other dimensions of price that should also be considered. Forms of payment range from a single, once-and-for-all, front-end payment for a defined technological possibility to a combination of payments based on various factors.

A once-and-for-all payment is a lump-sum payment used to divest the licensor of the technology or knowhow. Price is generally negotiated in a range determined by the cost to the licensor to dispose of the technology plus any risk of having the technology (or knowhow) controlled by another party and the cost to the buyer of duplicating the work effort. In other cases, payments may only be in the form of royalties. Arriving at a reasonable royalty rate becomes the purpose of negotiations.

Minimum royalties may be required by the laboratory as part of establishing performance criteria. With a minimum, the firm is required to pay a set amount on a schedule, regardless of sales. This is an effective provision in assuring that the technology is actually commercialized. Minimums may be used with exclusive or nonexclusive licenses.

One of the more interesting issues has to do with grant-backs. The seller seeks to include (as part of the price) a provision that the buyer (i.e., licensee) "grants back" to the seller any improvements the firm makes in the technology. This may not be applicable to Federal laboratories in domestic (i.e., U.S.) transfers, but it could be an important consideration if foreign firms are involved in the transaction.

Setting Royalty Rates

In most cases, the laboratory's compensation will be made in the form of royalties, so the major problem becomes how to determine a royalty rate. As we have said, the R&D costs do not provide a guide for establishing royalty rates. So, what are the criteria?

The criteria are directly related to the value to be derived by the buyer--that is, an opportunity to earn profits. Therefore, the most appropriate criterion as a starting point becomes the profit-generating potential of the technology.

The laboratory could rely on the prospective buyer or buyers to supply this information, but it will be valuable for evaluation purposes and pricing negotiations for the laboratory to develop its own independent information. The place to begin is to estimate the development, manufacturing, and marketing costs the licensing firm will incur in its efforts to commercialize the technology. Market information will also be needed to project potential revenues from sales the firm can reasonably expect. The appropriate period may be based on the expected life cycle of the product, length of the patent, or other criteria.

NOTE: SEE UNIT 17 (MARKETING TECHNOLOGY) FOR DETAILS ON CONDUCTING A MARKET ANALYSIS.

With these two items--potential revenues and costs--the potential profit can be estimated. The royalty rate will then be calculated as a percentage of the estimated profit. In practice, however, many firms will use sales (or revenues) as the basis for determining the rate, because firms are reluctant to reveal profit margins.

Transparency 18-13: The 25% Rule

The "25 percent rule" is sometimes used as a point of departure in initiating price negotiations. The rule asserts that the licensor may be entitled to 25 percent of the expected net profit (before taxes) of sales. In order to achieve an agreement at the 25 percent level, the licensor must offer a strong track record of other successful transfers. A strong package is also required that might include:

- Enforceable patent or patents
- Knowhow
- Copyrights

The licensee's position must also be strong for the licensor to participate at a level of 25 percent, since the licensee must be capable of sustaining large profit margins. The firm's costs to commercialize the technology will be reduced if manufacturing capabilities (in-house or by subcontract) already exist. Another factor is the degree of competition or other risk (e.g., large expenditures to meet regulatory requirements) that will be incurred because of the technology. Naturally, a technology with no competition can be priced higher than one that competes with other alternatives. It is very unlikely that there are no alternative technologies.

Transparency 18-24: Calculating Royalty Rates: An Example of the 25% Rule

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Assuming that the two parties have agreed that the licensor is entitled to a royalty based on 25 percent of the net profit, here is an example of arriving at the royalty rate. The revenues and total costs are calculated. Costs are calculated as a percentage of revenues. The

total cost in this example is 80 percent of revenues, leaving a pretax profit (which, in the example, is 20 percent of revenues) margin of 20 percent. Twenty-five percent of the net profit margin is five percent. Five percent is the royalty rate. Under no circumstances should this technique be used as an absolute rule. It is merely an acceptable place to begin to assess the strengths and weaknesses of the technology and the potential licensee.

Some industries have royalty standards that can be used as guidelines. Most royalty rates range between three and eight percent. In software, it may be as much as 20 percent. The important point to consider is that the royalty rate should be set high enough to assure commercialization and produce a return for the laboratory (including public nonmonetary benefits) and low enough so that the firm can achieve a large enough return on its investment to justify commercializing the technology. The "right place" is reached when these two conditions are met.

NOTE: REMOVE TRANSPARENCY AND ASK FOR QUESTIONS, COMMENTS, AND DISCUSSION.
