Economic Approaches to Remedies in Trade Secrets Cases

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BACKGROUND ON TRADE SECRETS

Intellectual property is a significant driver of the U.S. economy. According to one estimate, intellectual property in the United States is valued between $5 trillion and $5.5 trillion, dwarfing the total GDP of most countries. Trade secrets are one of the four main categories of intellectual property rights, along with patents, copyrights, and trademarks.

According to the Uniform Trade Secrets Act (UTSA):

“Trade secret’ means information, including a formula, pattern, compilation, program, device, method, technique, or process, that:

i. Derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and

ii. Is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.”

Over the last two decades, investments in intellectual property generally, and trade secrets specifically, have grown exponentially due to the inextricable linkages between innovation, technology, and economic growth. For example, Shapiro and Hassett note that “[e]xtensive economic research and analysis have established that economically-powerful forms of intellectual property, embodied in innovations, are the largest single factor driving economic growth and development.” One proxy for the value of a company’s intellectual property is the value of its intangible assets. Intangible assets have experienced remarkable growth over the last few decades, growing from 68% to 80% of the total value of companies comprising the S&P 500 index between 1995 and 2010. Similarly, according to other estimates, company secrets account for two-thirds of the value of firms’ informational portfolios. As the global economy becomes increasing reliant on informational portfolios, the significance of trade secrets is bound to increase.

Advances in computing and digital storage have made the misappropriation of trade secrets easier. Further, increased mobility of the workforce has led to more opportunities to misappropriate a previous employer’s trade secrets. In fact, in more than 90% of state and federal trade secret cases, the alleged misappropriator was either the trade secret owner’s employee or business partner. Trade secret theft can result in substantial costs to companies; the American Society for Industrial Security (ASIS) estimates that the theft of intellectual property costs U.S. companies as much as $300 billion annually. Consequently, litigation involving the alleged misappropriation of trade secrets has increased steadily. In the United States, the number of federal trade secret theft cases doubled between 1988 and 1995, doubled again between 1995 and 2004, and is projected to double again by 2017.

The monetary value of trade secret awards and settlements can be as high as hundreds of millions of dollars. For example, some of the largest recent damages awards and settlements include:

- $947 million in 2011 to St. Jude Children’s Research Hospital based on an employee’s misappropriation of trade secrets.
- $920 million in 2011 to DuPont for trade secrets misappropriation related to its Kevlar fiber product.
- $525 million in 2011 to Seagate based on misappropriation by Western Digital.
- $310 million in 2011 to MGA Entertainment in its dispute with Mattel over MGA’s line of Bratz toy dolls.
- $290 million in 2009 to Taiwan Semiconductor Manufacturing based on misappropriation of trade secrets, patent infringement, and breach of contract by Semiconductor Manufacturing International.
DAMAGES IN TRADE SECRETS CASES

The UTSA provides for a variety of remedies for the misappropriation of trade secrets. In this section, we present a brief description of each remedy and explain the economic approach to valuing trade secrets under the relevant remedy. The UTSA provides for the following remedies:

- Injunctive Relief
- Damages
  - Lost Profits
  - Unjust Enrichment
  - Reasonable Royalty

Injunctive Relief

Plaintiffs often seek injunctive relief in trade secret cases because irreversible events may occur in the time it takes to decide a case and provide an appropriate remedy. For example, Almeling et al. note that almost one-third of trade secret cases that they reviewed contained motions for restraining orders and/or preliminary injunctions.

The UTSA offers injunctive relief as a possible remedy in cases where the alleged misappropriation of the trade secret caused irreparable harm. To determine that an injury is irreparable, “a court may look to the absence of a measure of damages or the inability of damages to compensate adequately the injured party.” Further, speculative harm or the mere possibility of harm is insufficient to obtain injunctive relief.

From an economic standpoint, any harm that is difficult to quantify with precision may be considered irreparable by the courts. For example, consider a drug company that faces a dramatic loss in revenue because of increased competition due to the misappropriation of trade secrets. If the loss in revenue is quantifiable using standard economic models, then the harm is reparable. However, other negative repercussions of a reduction in revenue may be irreparable. For example, a dramatic revenue loss can reduce the research and development (R&D) budget. This is because drug companies tend to fund R&D with internal financing sources, such as cash flow and profits. The positive relationship between sales and R&D expenditure is well-documented in the academic literature. For example, Vernon has shown that for every dollar decrease in cash flow, R&D investment decreases by about 22 cents. It is difficult to quantify the effects of forgone R&D on a drug company and the patients who could have benefitted from the research findings. In large part, this quantification issue arises because the drug development process is lengthy, risky, and highly uncertain. As a result, a drug company that falls behind in an R&D race may forgo significant—but highly uncertain—profits if it falls behind rivals in researching a drug that subsequently succeeds. Guha and Salgado have documented instances in which courts have accepted some sources of irreparable harm in at-risk generic entry cases in the pharmaceutical industry. Their research showcases the case-specific nature of the sources of irreparable harm.

Injunctive relief and damages are not mutually exclusive. Indeed, the courts may prohibit the use of the allegedly misappropriated trade secrets and also allow for damages for the use of the misappropriated trade secrets prior to the injunction. However, injunctive relief may limit the recovery of damages. According to the UTSA, “injunctive relief will ordinarily preclude a monetary award for the period of time in which the injunction is effective.”

Damages

Misappropriation of trade secrets can impact the profits of the defendant and plaintiff through its effect on prices, quantities, and costs. Assessing the impact of the misappropriation of trade secrets requires an economic analysis of how these variables would have evolved if the defendant had not misappropriated the trade secrets. Such an analysis involves a consideration of the alternatives to the misappropriated trade secrets available to the defendant and the impact of these alternatives on prices, quantities, and costs. This analysis is referred to as the “but-for world” analysis.

Damages can then be calculated as the difference in profits between the but-for world and the actual world.

From an economic perspective, trade secrets differ from patents in an important way. Even if a competitor has knowledge of patented information, it cannot use that information until the expiry of the patent. In contrast, once a competitor legitimately discovers a trade secret, it can legally use that information to derive economic profit. This distinction creates a unique temporal dimension to the economic impact of the misappropriated trade secret. Specifically, damages should be based on the period between when the misappropriation occurred and when the defendant would have legitimately discovered the trade secret in the but-for world (the economic impact of the misappropriation may extend beyond that period).

The plaintiff is only entitled to damages due to the misappropriation of the trade secrets, so any damages analysis must include an apportionment of the value attributable to the specific misappropriated trade secrets. According to the principles of economics, the value of a trade secret can be determined to a large extent by the availability and cost of substitutes. Typically, a trade secret with easily available and inexpensive close substitutes will have relatively less value.
In a number of circumstances, the defendant may have access to either the trade secret or a close substitute to the misappropriated trade secret (i.e., one that serves the same functional purpose). For example, firms in the pharmaceutical industry often present test results based on novel compounds or formulations at conferences and marketing events. This information can be used to reverse engineer the misappropriated trade secret. Similarly, the defendant may be able to gain access to either the trade secret or a close substitute when a product embodying the trade secret is released in the market. In the but-for world, access to close substitutes to the trade secret allows the defendant to enter the market with the same product as in the actual world. However, the defendant could face a delay in entering the market, resulting from the time spent on independently developing or legitimately discovering the trade secret or a close substitute. The defendant could also accrue additional costs to acquire either the trade secret or a close substitute. In both cases, the damages would be based on the period when the information was confidential, and the defendant would not have discovered the trade secret without misappropriating it. In the section below titled "Examples of Damages Calculation," we present an example in which damages are calculated assuming the defendant is delayed in entering the market.

Alternatively, the defendant may have access to only an imperfect substitute to the trade secret or no substitute at all. In contrast to the previous scenario, this scenario involves assessing the impact of developing a product that does not use the misappropriated trade secret on prices, quantities, and costs. This is because in the but-for world the defendant would not have access to either the trade secret or a close substitute and therefore would have entered the market with a different and possibly inferior product. In the Examples of Damages Calculation section, we present an example in which conjoint analysis is used to ascertain the value of the misappropriated trade secret.

The scenarios described above affect the but-for world calculations. If the defendant’s entry to the market is delayed, the plaintiff may accrue economic benefits. This could be in the form of an increase in the quantity of the product sold, an increase in the price of the product, or both. Similarly, an increase in the defendant’s costs could impact the price of the defendant’s product, thereby changing the competitive landscape in the product market. Lastly, if the defendant enters the market with an inferior product, the plaintiff may benefit by charging a higher price and/or selling a higher quantity.

An economic analysis of plaintiff and defendant behavior in the but-for world requires careful consideration of various factors that affect the profits of a firm. For example, the plaintiff may not have the manufacturing or marketing capacity to exploit the delayed competition in the but-for world. In addition, firms often face incremental costs in satisfying increased demand. However, incremental costs increase as the firm nears capacity. Consequently, reliance on historical incremental costs could understate projected incremental costs and overstate profits.

Once the impact of defendant and plaintiff behavior in the but-for and actual worlds has been determined, it is possible to calculate lost profits for the plaintiff as well as unjust enrichment for the defendants. Plaintiff lost profits result from a difference in profits earned by the plaintiff in the but-for world (assuming no misappropriation of the trade secret) and actual world. Similarly, unjust enrichment results from the difference in defendant profits between the actual world and the but-for world.

**Plaintiff Lost Profits**

As described above, the UTSA provides a compensatory measure of damages that ensures that the owner of the trade secret is made whole for any loss in actual or expected profits suffered due to the misappropriation of trade secrets. The plaintiff can only recover profits lost due to the misappropriation of the trade secret. Further, the courts dictate that the lost profits must be proven to a "reasonable probability." The sources of lost profits are case-specific and directly tied to the nature of the trade secret. For example, the misappropriation of trade secrets may allow the defendant to enter the market earlier than it otherwise would have without the misappropriation. As a result of additional competition, the plaintiff profits may decline. However, the extent of the decline in plaintiff profits depends on the economic and factual evidence in the case.

**Unjust Enrichment**

The UTSA also allows for the plaintiff to recover any illegitimate profits accruing to the defendant due to the misappropriated trade secret. Again, only profits that are directly related to the misappropriated trade secret are relevant. Similar to lost profits, the sources of unjust enrichment damages are case-specific. Typical sources include accelerated time to market and avoided costs, both in terms of development of the trade secret and improved productivity attributable to the trade secret.

Plaintiffs can recover both lost profits and unjust enrichment only insofar as the same dollars are not double-counted. Consider an example in which the defendant is able to enter a particular product market due to trade
secret misappropriation. This reduces plaintiff profits in two ways: revenues decrease by $100 due to a reduction in the quantity of products sold, and advertising costs increase by $25 due to increased competition directly attributable to the defendant’s entry into the product space. In this simplistic example, the plaintiff’s lost profit is $125. Also assume that the defendant’s revenues increase by the same $100, due to an increase in product sales directly attributable to the misappropriation. Further, the defendant’s costs decrease by $50 due to increased productivity, again, directly attributable to the misappropriation. Therefore, the total unjust enrichment is $150. While the sum of lost profits and unjust enrichment is $275, the plaintiff cannot claim this entire amount because the revenue loss for the plaintiff and the revenue gain for the defendant overlap, and hence would result in double-counting. In this simplistic example, the plaintiff would be able to claim a maximum of $175, which can be calculated as the sum of the revenue loss to the plaintiff or the revenue gain to the defendant ($100), the increase in advertising costs to the plaintiff ($25), and the reduction in defendant costs due to increased productivity ($50).

Reasonable Royalty Damages
In practice, the choice of economic approach is often determined by availability of reliable data. In some instances, damages based on lost profits and unjust enrichment cannot be easily determined. Plaintiffs generally proffer a reasonable royalty as an alternative measure of damages in such cases.

Reasonable royalty damages are based on a hypothetical negotiation that the plaintiff and defendant would have conducted to license the trade secret at a time before the misappropriation began.\(^{30}\) In such a negotiation, the plaintiff (the licensor) would consider the opportunity cost of entering into a licensing agreement with the defendant (the licensee). The minimum the plaintiff would accept for the license would be based on expected loss in sales resulting from the defendant acquiring the license. If the plaintiff and the defendant are direct competitors, the plaintiff might expect to lose a large part of its sales to the defendant. Conversely, if the plaintiff and the defendant serve different geographic or customer markets, lost sales might be minimal.

The maximum amount the defendant would be willing to pay would depend on the incremental benefit that the license provides compared to available substitutes to the trade secret. If a close substitute to the trade secret is available at almost no cost to the defendant, the trade secret would not hold much value. However, if the substitutes are imperfect or vastly inferior, the defendant would be willing to pay a much higher amount to license the trade secret. There are two components to reasonable royalty: the royalty base and the royalty rate. Both the royalty rate and the royalty base are required to have “sound economic and factual predicates.”\(^{31}\) For example, the calculation of the royalty base requires a careful consideration of the revenue attributable to the misappropriated trade secret which can be ascertained using market data or survey techniques.\(^{32}\) These approaches are described in the Examples of Damages Calculation section.

The royalty rate can be determined by reconstructing a hypothetical negotiation between the plaintiff and the defendant, based on the 15 Georgia-Pacific factors.\(^{33}\) From an economic perspective, some of these factors are closely tied to the availability of substitutes to the trade secret. In addition, these factors account for technical, financial, and licensing features of the trade secret. The importance of each factor is tied to the factual evidence in a case.

EXAMPLES OF DAMAGES CALCULATION
As described in the previous section, economic analysis of the damages resulting from the misappropriation of trade secrets is highly case-specific and requires careful consideration of the economic impact of the misappropriated trade secret. In this section, we provide two examples that describe the economic approach used to calculate damages resulting from the misappropriation of trade secrets.

Damages Based on Delayed Launch
In this example, we show the economic approach to calculation of damages under the assumption that the defendant has access to the trade secret, albeit with a delay. As described below, a delay can impact both plaintiff and defendant profits as it changes the competitive landscape of the product market.

Company A is a pharmaceutical manufacturer that has a drug with a novel formulation in pre-clinical development. It hires Company B to consult on some specialized tests. Soon after termination of their consulting agreement, Company B begins development of a competing product using a similar formulation, unbeknownst to Company A. After successful clinical trials over a period of several years, Company A launches its drug in the market. However, it learns that Company B is planning to launch a competing product that uses a similar formulation in a few months’ time. Company A sues Company B for stealing trade secrets related to its drug formulation.

Economic damages in this scenario are based on the premise that without knowledge of Company A’s trade secrets, Company B would not have been able to develop its own
drug and therefore would not have a drug on the market. Under a lost profits framework, Company A has suffered harm because it will lose sales to a close competitor. Under an unjust enrichment framework, Company B will gain sales, at least some of which should have gone to Company A. Under a reasonable royalty framework, the hypothetical negotiation to license the trade secret would have been based both on the expected loss to Company A and the expected gain to Company B due to the misappropriated trade secrets.

Now, suppose that two years after the termination of the consulting agreement, Company A publicly discusses its novel formulation at a scientific conference. In this scenario, the but-for world is not one in which Company B would not have been able to develop its drug at all. Instead, Company B would have been able to begin the development of its drug with a delay, after Company A publicly disclosed information about its novel formulation. Assuming the development times for the two companies are identical, Company A would have enjoyed market exclusivity only for two years. Therefore, damages would be based on Company A’s market exclusivity for those two years.

The issue of delay in launch raises some important challenges in the calculation of damages. The evolution of Company A’s drug sales depends on the magnitude of delay in the launch of Company B’s drug. Additionally, the impact of the launch of Company B’s drug would be different depending on whether Company A’s drug is new to the market or in a late stage of its life cycle. Similarly, the evolution of the market as a whole depends on the number of competitors in that market. While Company A loses sales directly to Company B due to competition, it also benefits from the market-expanding promotional efforts of Company B. This is especially true of markets that are not mature. Another important consideration is the timing of launch of potential competing products. Further, insurance companies play an important role in determining which drugs become successful upon launch, as they are responsible for paying for a majority of drug costs.

**Damages Based on Imperfect Substitutes**

In this example, we show the economic approach to damages calculations when the defendant does not have access to the trade secret or a close substitute. We also describe a statistical technique known as conjoint analysis, which can be used to ascertain the economic value of the misappropriated trade secret.

Company A is a smartphone manufacturer. Its latest product has several new features including a voice-activated assistant (e.g., Siri on the iPhone). This assistant uses a software algorithm that accurately understands commands 90% of the time. Other known algorithms have a maximum accuracy of 50%. Company B poaches some engineers from Company A and launches a new smartphone with an equally accurate voice-activated assistant. Company A sues Company B for stealing its trade secrets.

As in the previous scenario, economic damages can be based on lost profits, unjust enrichment, or reasonable royalty. For each of these approaches, damage calculations are based on the premise that had Company B not stolen Company A’s trade secrets, it would have an inferior product with a voice-activated assistant with a maximum accuracy of 50%. Under a lost profits framework, Company A would have competed with an inferior product and would therefore have gained a greater market share. Under an unjust enrichment framework, Company B would lose the incremental sales that it obtained because of the improved accuracy of this product feature. Under a reasonable royalty framework, the hypothetical negotiation to license the trade secret would be based on the incremental value provided by the improved accuracy of the voice-activated assistant.

Under each of these approaches, it is necessary to parse out the incremental value or harm attributable to the improved accuracy of this feature. This can be done in two ways. If there are products in the market with voice-activated assistants with 50% accuracy and 90% accuracy, then market data can be used to determine the incremental value of the accuracy improvement. However, in many situations, such clean comparisons are not available. In such situations, a technique known as conjoint analysis can be used.

Conjoint analysis is a statistical technique used extensively in marketing research. This technique involves using surveys to examine how consumers make tradeoffs between the different attributes that characterize a product. If the survey is properly designed and analyzed, it can be used to determine consumer behavior in hypothetical scenarios. For example, a survey can be used to ascertain the willingness to pay for a given feature (e.g., improved accuracy of the voice-activated assistant). Similarly, a survey can assess how likely consumers are to purchase hypothetical products with or without a given feature.

The intuition is as follows: suppose consumers are presented with two hypothetical products, one with 90% accuracy of the voice-activated assistant, priced at $500, and another with 50% accuracy of the voice-activated assistant, priced at $480. The two products are identical in all other respects. If, when presented with a choice between these two products, a consumer chooses the first
product, this implies that he values improved accuracy of the voice-activated assistant by at least $20. On the other hand, if the consumer chooses the latter product, this implies that he values the accuracy improvement at less than $20. By providing a variety of such scenarios at different price points and different features, researchers can determine how consumers value different features. Similarly, one can determine what proportion of consumers will buy a particular product with an improvement and therefore determine the incremental market share gain attributable to the product improvement.

Companies have used conjoint analysis extensively to design and price products and services. Famously, the Courtyard by Marriott chain was designed and developed based on a conjoint analysis study of business travelers.

Courts have also begun to accept the use of conjoint analysis in intellectual property litigation. For conjoint analysis to be useful in litigation, it must be carefully designed and conducted. Typically, the study should include product characteristics beyond the characteristic at issue in order to provide survey respondents with realistic choices. It is also important that the language and questions in the survey are understandable to the respondents.

**CONCLUSION**

This paper presents some economic approaches to estimate damages in trade secret cases. The specific economic approach that can be applied depends on the availability of substitutes to the misappropriated trade secrets. For example, when close substitutes are available, the economic analysis can be framed as calculation of the impact of either a delay in entering the market and/or an additional cost. In contrast, when the substitutes are imperfect, or unavailable, damages are calculated based on the introduction of a different and possibly inferior product. In such cases, damages can be calculated using available market data and/or statistical techniques such as conjoint analysis.

**ENDNOTES**


5. Informational portfolios include proprietary company secrets and proprietary custodial data. The figure is based on a worldwide survey of decision-makers from 305 organizations that had primary responsibility or authorization over IT security budgets. “The Value Of Corporate Secrets: How Compliance And Collaboration Affect Enterprise Perceptions Of Risk,” Forrester Research, Inc., 2010. Available at: http://www.nsi.org/pdf/reports/The%20Value%20of%20Corporate%20Secrets.pdf, at p. 3.

6. These categories were defined as follows: “the alleged misappropriator (1) was, or was assisted by, a current or former employee of the trade secret owner; (2) was, or was assisted by, a current customer, or a former or expected business partner of the trade secret owner, such as a licensee, original equipment manufacturer, joint venturer, distributor, or supplier.” Almeling, D., “A Look At State Court Trade Secret Stats,” Law 360, 2011.


16. The UTSA also allows for exemplary damages to punish and deter willful and malicious conduct. According to the UTSA, exemplary damages may be up to twice the underlying damages. See Uniform Trade Secrets Act with 1985 Amendments, Comment to §3.


23. Uniform Trade Secrets Act with 1985 Amendments, Comment to §3.


25. Firms are allowed to reverse engineer trade secrets, but not information protected by patents. See Uniform Trade Secrets Act with 1985 Amendments, Comment to §1.


29. Uniform Trade Secrets Act with 1985 Amendments, Comment to §3.

30. Riles v. Shell Exploration & Production Co., 298 F. 3d 1302, 1311 (Fed. Cir. 2002). However, in some instances “factual developments occurring after the date of the hypothetical negotiation can inform the damages calculation.” This is sometimes referred to as the “Book of Wisdom” approach. Sinclair Refining Co v. Jenkins Petroleum Process Co, 289 U.S. 689, 696 (U.S. 1933).


36. For example, conjoint analysis was used to determine the value of patented features in Apple Inc. v. Samsung Electronics Co., LTD., Samsung Electronics America, Inc., Samsung Telecommunications America, LLC, No. 11-cv-01846-LHK (United States District Court Northern District of California San Jose Division).

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