Analytical Methods for Lawyers

Howell E. Jackson

What skills must new lawyers master to be effective advisers and intelligent advocates?

For more than a century American legal education has been organized around the assumption that the ability to engage in analogical reasoning—first and foremost through the analysis of appellate judicial decisions—was the principal skill law schools should impart to their students. Hence the prominence of common law courses, such as Torts and Contracts, where young lawyers can hone the ability to make meaningful distinctions and draw persuasive analogies. Even as the curriculum has been expanded to embrace a wider range of statutory and regulatory materials, the pedagogical emphasis has remained substantially similar: a careful parsing of authoritative texts supplemented, depending on the teacher’s predilections, with argumentation based on an array of academic disciplines drawn principally from the social sciences and humanities. Notwithstanding the expansion of the law school curriculum, the characteristic mode of evaluation for legal education remains examinations that present complex fact patterns for which students are expected to divine applicable legal doctrines, identify legally relevant facts, and evaluate the relative merits of potentially competing claims.

All this is well and good. After a year or two dedicated to these pedagogical objectives, students start to think like lawyers. But simply thinking like a lawyer has never been enough. Law schools expend considerable resources introducing their students to skills beyond traditional legal analysis. Aspiring lawyers must be trained in how to find the many sources of the law and assess their precedential value. Students must be taught how to reduce their research into clear and effective prose in forms most common to the legal profession: the memorandum, the brief, and various types of pleadings. Students must also be instructed in how to present the analysis in a variety of interpersonal settings, from closing arguments to negotiations between opposing parties. Finally, there are all the practice skills covered in the breadth of clinical offerings that constitute an increasingly important part of the modern law school curriculum.

But law schools should do more. In the legal world and beyond, analysis and argumentation are increasingly quantitative. Lawyers—whether corporate counsel or public interest advocates—must work in a world in which

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arguments are framed in quantitative terms and the evaluation and presentation of data are critical to effective advocacy. Hence, Lee Epstein and Gary King’s first recommendation: “that law schools . . . incorporat[e] into their curriculum at least one course on empirical research [which would be] required for students serving on the school’s law review . . . and probably for all others as well.”

Having participated along with several other members of the Harvard Law School faculty in the creation of a similarly spirited course—Analytical Methods for Lawyers—I am extremely sympathetic to their proposal for curricular reform. Quantitative skills are essential for lawyers in the twenty-first century. Many very capable students come to law school without extensive training in quantitative methods, and some will have taken their last challenging course in quantitative analysis (perhaps Algebra II or Trigonometry) many years earlier. Quantitative skills are, moreover, not some sort of unpalatable nutrient that students will invariably resist. On the contrary, our experience at Harvard is that students who lack quantitative background are acutely aware of the deficiency and readily enroll in courses that promise to demystify concepts and techniques that are clearly important to practicing attorneys. Though only introduced into our elective curriculum in the spring of 2000, our Analytical Methods course already reaches between a fifth and a quarter of our students, most of whom choose to take the course in the spring semester of their first year. The course is also increasingly popular with foreign graduate students, who recognize quantitative analysis as a distinctive feature of the American legal practice and an influential model for legal systems around the world.

While I have considerable sympathy for Epstein and King’s notion that law school curricula should be expanded to include more quantitative training, I have a somewhat different take on how an introductory course should be structured and the extent to which such a course should be focused on research design and evaluation. I also differ with Epstein and King on the question of whether such a course should be mandatory. And I believe considerably more attention should be given to the question of how students should be drilled in and tested on their knowledge of quantitative methods.

Let me begin with the question of coverage. If you had to construct a single course to introduce law students to quantitative techniques, what skills should be covered? Epstein and King’s proposal would appear to dedicate the entire course to empirical methods, introducing students to regression analysis and preparing law review editors to deal with articles including substantial elements of empirical analysis. While there is much to recommend such a course and the level of detail it could afford, I think the optimal introductory course should include much broader coverage. For example, in the case of Analytical Methods for Lawyers at Harvard, we build the course around a nine-chapter textbook.\(^2\) We spend a week or two on each chapter, and can complete the

entire course of study in a thirteen- to fourteen-week semester.

Chapter One introduces students to decision analysis, a set of techniques traditionally taught to first-year M.B.A. students. Increasingly practicing lawyers make use of decision trees to review litigation strategies and settlement offers. With a few relatively simple tools, decision trees help lawyers unpack complex decisions and advise clients choosing among various possible courses of action. The chapter introduces concepts such as probability, expected values, sensitivity analysis, risk aversion, and the value of obtaining additional information. It’s hard to imagine a lawyer giving effective advice without a familiarity with these basic analytical tools, yet the explicit study of decision analysis is totally absent from the traditional law school curriculum.

Chapter Two expands on decision analysis to introduce basic game theory and strategic challenges raised by incomplete information. In many contexts where lawyers offer advice, the decisions of their clients will depend in part on what they expect to be the actions and reactions of others. Game theory offers an analytical structure to help students recognize and evaluate problems of this sort. In a similar spirit the chapter introduces students to the basics of information theory, including moral hazard and adverse selection. While many students will have heard these terms mentioned in other law classes, many don’t have a clear understanding of their meaning or how they can complicate negotiations and contracts. Nor have students been exposed to standard solutions to the prisoner’s dilemma or other similarly recurring difficulties.

Chapter Three presents an overview of the function of contracts and a toolbox for designing effective agreements—contracts that will accomplish clients’ objectives and avoid common pitfalls. In contrast to most first-year contracts courses, which emphasize legal doctrines governing contract formation and damage awards, this chapter offers students a practical framework for determining what kinds of provisions contracts should include—for instance, when to use a cost-plus fee structure as opposed to a fixed payment, or how to structure a contract to ensure that work is completed on time. In addition to reviewing actual terms from real contracts, the chapter considers the avoidance and resolution of contract disputes, topics also typically absent from first-year contracts courses.

In Chapter Four we turn to analytical skills typically associated with business courses and practice: accounting and the interpretation of financial statements. Lawyers—not just corporate counsel—should have a basic understanding of these topics. Accounting is pervasive in modern legal practice. Family lawyers negotiating divorce agreements or child custody arrangements must be able to interpret and critique financial statements. Employment agreements often include compensation provisions that are expressed in terms of accounting standards. Nonprofits and government agencies all measure their performance in accordance with financial reports. Much information obtained in discovery is of a financial nature. Without a passing acquaintance with balance sheets and income statements, law school graduates face a serious handicap when they enter the world of practice, whatever their area of specialization.
Chapter Five offers an introduction to the field of finance. Our task here is threefold. In terms of basic skills development, the core of the chapter is an introduction to the time value of money: the most basic concept in finance and the one that new lawyers must fully internalize in order to be able to represent their clients sensibly in a variety of legal contexts, from contract negotiations to litigation settlements. We then introduce a series of more advanced concepts in finance theory such as diversification, the relationship between risk and return, and rudimentary coverage of asset pricing models and valuation techniques. The chapter also provides a selection of excerpts from classic writings in the field of finance. We include these excerpts to expose students to an intellectual tradition that will be familiar to their classmates who have studied economics and finance as undergraduates and that is often taken for granted in upper-level courses on corporations and advanced commercial topics. These readings also offer an important alternative perspective on the goals of financial analysis.

Chapter Six presents a primer in basic microeconomics. While many students have been exposed to economics, some have not, and a large number will have taken introductory courses at the undergraduate level that make no effort to relate the basic concepts of microeconomic analysis to problems that lawyers are likely to encounter in practice. Accordingly, in this chapter, we review the basic tools of microeconomics—including supply and demand, public goods, externalities, and marginal analysis—and then relate these concepts to common legal problems.

Chapter Seven is an introduction to the field that has become known as law and economics, the hallmark of which is attention to the effect of law on individuals' and firms' behavior. Here the basic ideas of law and economics are discussed for the core areas of law—property, tort, contract, and crime—as well as for litigation. For example, in torts, we discuss how rules of negligence and strict liability influence incentives to reduce risk, and we also examine the relationship between tort liability and insurance. Students will sometimes have encountered law and economics thinking in small doses in their courses, but a systematic treatment is a different and highly valuable enhancement to their usual exposure.

Finally, in Chapters Eight and Nine, we turn to empirical techniques. In Chapter Eight, "Fundamentals of Statistical Analysis," we begin by introducing the basic elements of descriptive statistics, including various measures of central tendency and variability, with a particular emphasis on the value of visual presentations of data in histograms and other graphic formats. We then turn to the basic elements of sampling and survey design, concepts that many treatments of empirical methods often overlook. Finally, the chapter offers an informal presentation of the two most important tools of inferential statistics: hypothesis testing and estimation.

Chapter Nine concludes our treatment of empirical methods with an introduction to multivariate analysis. We start off with simple linear relationships, with which we introduce correlation coefficients and linear regressions. We then extend the analysis with an introduction of multiple regression in the
context of discrimination litigation. The chapter ends with a short discussion of some of the most common difficulties in making inferences from multiple regressions: the omission of important explanatory variables, the inclusion of irrelevant variables, the effect of multicollinearity, and the problem of two-way causation.

So how does our course compare to the one that Epstein and King propose? Well, obviously our coverage is much broader than theirs, reflecting our view that there are many quantitative skills that law students must acquire to be effective advocates or even well-informed law review editors. Each section of our book could easily be amplified in another semesterlong treatment. And, at least at a law school as large as Harvard, we do offer additional courses on many subjects, either at the law school (corporate finance, economic analysis of the law, various law and economics seminars, and advanced courses in empirical methods and statistics) or elsewhere in the university (economics department courses on game and information theory, business school courses on the analysis of financial statements and financial theory). But even though our coverage is much wider than that proposed by Epstein and King, we manage to touch upon many of the points about empirical methods that they stress in their article. Indeed, were law review editors to bone up simply on our two chapters on empirical methods, they would be attuned to many of the problems for which Epstein and King castigate the legal academy.

Given our experience in developing a course designed to teach law students quantitative techniques, I will conclude with a discussion of some of the more practical aspects of incorporating such a course into the law school curriculum.

First, which law students should take courses in quantitative reasoning? Epstein and King advocate, one senses perhaps fancifully, that their empirical course be made mandatory for all law students. In my view, mandates in this area would be inappropriate. While many law students have little training in quantitative reasoning, others come to law school with considerable background—even advanced degrees—in quantitative skills. Requiring such students to take a mandatory course in quantitative skills has two problems: first, it wastes valuable classroom hours for students who already possess the necessary skills; second, it greatly complicates the pedagogical challenge to the professor who must teach to a class full of students with widely different needs and interest.

A better approach is to make the class optional, but to take steps to help students decide whether they are lacking skills in particular areas. Although we have not yet done so at Harvard, one could imagine putting together a series of diagnostic exercises to help students determine whether they have at least rudimentary understanding of the basic areas of course coverage: decision analysis and game theory, accounting and finance, microeconomics and economic analysis of the law, and statistical analysis. Those who could not pass these screening test would be advised to take the introductory course or find some other way to master the subject matter. Ideally the curriculum would be
designed to allow students to enroll only in those modules where they lacked basic skills. In our experience, many students may have background in one area—for example, microeconomics—but have very little prior training in accounting or decision analysis. So the ideal course in analytical methods would be an optional series of modules from which students could select whatever components they require.

A further practical question is when such a course should be offered to students. At Harvard our choice has been to locate the course in the spring term so that students can take it during the second half of their first year. At that point the students know something about legal doctrine and civil procedure, and are beginning to understand the various roles that lawyers are called upon to play in both litigation and transactional settings. As a result, it is possible to use problems that draw upon their legal training: for example, considering how to decide whether to hire an expert witness for a civil trial or what kind of compensation provision to put into a personal service contract. While students would have even greater knowledge of legal problems by the second or third year, there are important offsetting costs of delaying the timing of the course. Many of the skills that we teach in our analytical methods course are essential building blocks for upper-level courses. Accounting and finance provide important background for corporations classes and other commercial courses. Knowledge of statistical methods is useful in upper-level courses on employment discrimination and many other areas of public policy analysis. Particularly for students most in need of quantitative skills training—the French literature major who dropped math after eleventh grade—we strongly recommend that the course not be postponed till late in the second or third year of law school lest these students be needlessly disadvantaged in other upper-level courses.

Next, there is the issue of feedback and examinations. One of our assumptions in developing Analytical Methods for Lawyers is that we should not rely on a single final examination to assess student performance. In other areas of the university where analytical skills are taught, a critical component of instruction is the weekly problem set or laboratory exercise, and that is the model we have adopted in our teaching of the course. We have used a four-hour-per-week format. We divide each week of classes into two lectures and one session devoted to the review of a written exercise that the students must submit in advance and on which they are graded each week. Over the course of the semester, students are expected to complete ten to twelve such exercises, which together account for about a quarter of their course grade. For the balance of the grade we use two midterm examinations, each approximately an hour and a half and each covering roughly one-half of the course. In our experience, regular written exercises and prompt feedback is the best way for students to internalize new analytical skills. While there is a cost associated with these weekly exercises—preparing and grading weekly exercises is time-consuming—the offsetting benefit is considerable. Students feel empowered when they have actually used—successfully—their newly acquired skill. Moreover, they generally seem to enjoy the opportunity to complete much of their work in one course before the end of the semester.
A separate practical concern relates to the issue of who should teach a course on analytical methods. In our view, the concepts covered in our book are either already known, or easily enough understood, so that most instructors who teach commercial, corporate, or economic courses would find themselves entirely comfortable presenting most of the topics covered in the text. Formal training in the subject matter is not necessary. The course lends itself to team teaching, and at Harvard three or four members of the faculty typically teach the course collaboratively, with each person responsible for covering two or three chapters of material. We also typically use a teaching assistant to help grade the weekly written exercises. We know that many schools—whether because of instructor preferences, limited class hours, or overlaps with other offerings—may well choose to offer only a selection of modules. Our text is designed so that this is readily accomplished, for each chapter (or group of two) is entirely self-contained.

Finally, there is a question of how a course in analytical methods relates to other semesterlong law school courses, such as corporate finance, analysis of financial statements, economic analysis of the law, or empirical methods in the law. At least at Harvard, we have tended to view Analytical Methods as an optional gateway to these upper-level offerings. Oftentimes students with no prior training in quantitative methods will take our course and then choose to go on to advanced upper-level courses on related subjects. This strikes us as entirely appropriate. (We do, however, prevent students who have taken two or more upper-level courses in related fields from enrolling in the overlapping modules in Analytical Methods.)

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In conclusion, I am happy to join Professors Epstein and King in advocating a new course to introduce law students to important quantitative skills. I differ only in my view that the scope of such a introductory course should be a good deal broader than the one they propose. Empirical analysis and the rules of inference are important skills, but they are not the only quantitative methods that lawyers need master in order to become effective advocates and informed advisers in the modern world.