biotechnology engendered a process of commercialization that is beyond academic control. Nevertheless, the immersion of American universities in the marketplace has, on balance, brought them greater resources and better students, as well as a far larger capacity for advancing knowledge. The contrast between these benefits for universities and the unwelcome social consequences engenders the paradox of the marketplace.

CHAPTER ONE

Universities as Knowledge-Based Institutions

THE AMERICAN UNIVERSITY of the twenty-first century is a distinctive organization. Compartmentalized in structure, it performs a multitude of functions that are largely predicated on a single qualification—the possession of expert, specialized, theoretical knowledge.[1] University faculty and researchers are distinguished chiefly by their expertise over delimited areas of knowledge. Such dominions are inherently specialized and esoteric. Distinct from other specialized expertise, academic knowledge strives for generality, an ineluctable tendency toward theory. Indeed, the modern university is above all a repository of this kind of knowledge. Universities literally store knowledge in their libraries, museums, archives, and institutes. However, the most important fund of knowledge lies in the expertise of faculty and professional staff.

The overriding norm for universities is to seek what was once called *truth*, although, given the prevailing relativism in some fields, many academics would shun this term. A more neutral formulation of this norm might be to establish "valid knowledge through systematic inquiry." It falls to academic disciplines, or equivalent forms of organized consensus, to define what modes of inquiry are legitimate and what knowledge is thereby validated.

Most university activities emanate from this foundation of academic knowledge, be they educating neophyte students or fledgling experts, extending the frontiers of knowledge, applying knowledge to praxis, or disseminating knowledge within and outside of the academy. There are many loose ends in this basic scheme. Universities have long been engaged in such apparently ancillary activities as the performing arts or athletics, but

these fields too invoke expertise and are subject to a relentless imperative to expand and improve the possibilities for expression or performance. A core of academic knowledge forms the basis for the bulk of university activities.

Knowledge-centered organizations generally allow a substantial degree of autonomy and discretion to professional employees. Software firms, biotech companies, and universities are largely compelled to allow knowledge workers the latitude to use their expertise in ways that only they know best. Knowledge-based organizations are consequently decentralized by nature, or bottom-heavy in organizational terms. Universities especially so. Individual faculty members work mainly alone when organizing the knowledge they will teach or when seeking to extend their own expertise. Research is a more interactive process, but decentralized nevertheless. For the purpose of structuring activities like courses and degree programs, academics are gathered into departments on the basis of recognized domains of knowledge. Departments in turn are grouped into schools or colleges in order to administer even larger knowledge domains. Authority over what is most important—knowledge—remains the basis of these organizational tiers. Each unit consequently possesses a large degree of autonomy, and integration into larger structures is inherently consensual.

The institution as a whole nevertheless requires some means of organizational control, and for the American university the most powerful lever is fiscal. If consensual authority flows upward from the bottom of the organization, fiscal control is exerted downward from the top. In most universities a provost or academic vice president, directly under the president, governs the academic units, being at once responsible for overseeing academic matters and disbursing funds. The provost's office allocates funds to the separate schools or colleges according to the policies and priorities of the university. College deans in turn determine the budgets of the departments according to the policies and priorities of the individual colleges. The departmental budget is heavily committed to the salaries of faculty and staff. Thus departments can undertake few initiatives without seeking additional funding from the dean. The same principle applies to deans, who must request additional resources from the provost. Administrative units thus retain a large measure of fiscal control over components, while at the same time permitting the operational autonomy of knowledge workers in their own spheres.

Individual universities naturally operate according to numerous permutations of this basic structure. Units or professors who generate their own income, for example, have correspondingly greater autonomy—the exceptions that prove this rule. This dual structure of authority nevertheless represents the first principles of university organization. These principles have important corollaries for universities.

Cohesion and inward focus characterize the knowledge domains that form the operating units of the university. Gathered together in an institution, such units assume a highly compartmentalized structure. Indeed, the earliest American universities have been described as thriving "on the patterned isolation of [their] component parts."[2]

The university itself provides a general framework of regulations, services, and resource disbursement, but each unit then fits the imperatives of its own operations into this loose framework. Faculty work and student learning are organized quite differently in a laboratory science such as chemistry, an applied field such as business, or a liberal art such as history. Moreover, with attention concentrated on their own affairs, members of one unit have neither understanding of nor meaningful influence over other domains. But compartmentalization extends well beyond academic units. Most universities, for example, have felt the need to create separate centers or institutes for certain kinds of research. At the University of California these have long carried the generic label of "organized research units," or ORUs, an acronym now widely used. In fact, adding largely self-contained and often self-financed units has allowed universities to perform a host of different tasks related to academic knowledge.

The multipurpose nature of universities is evident within academic units and across university units. Again, knowledge, or learning, is the common denominator—fostering student learning, facilitating faculty learning, and making the university's store of learning available to society. These different aims are felt by the individual faculty member, who must use professional judgment to balance obligations to students, research, the tasks of internal self-governance, and service to external constituencies. The balance of such activities varies greatly among the faculty according to individual proclivities and abilities, and it also varies for individuals over the course of a career.

The university also relies on special units to perform many of its associated and auxiliary tasks. In addition to academic departments and ORUs, a typical major university today operates a hotel and a dormitory system, a research park, probably with a business incubator, a hospital, a university press, a radio and perhaps a television station, a division for continuing education, and an athletics and entertainment complex. Such institutions are now billion-dollar operations. Measured in dollars, the instruction of students might represent less than half of their activities, that of undergradu-

ates still less. Most of this welter of activities bears some relation to the university's knowledge core, but the ties are sometimes tenuous.

The knowledge-centered nature of universities, in combination with the means of fiscal control, produces another set of consequences. University units at each level of the organization seek to maximize their own sphere of activity by obtaining as much revenue as is feasible. The same principle applies to universities as a whole. Howard Bowen's famous "law" holds that "in quest of excellence, prestige, and influence . . . each institution raises all the money it can . . . [and] spends all it raises."[3] In a like manner, colleges and departments within the university generally seek to expand their allocation of funds. The motive is not greed or gluttony, however, but something more like chronic undernourishment. In most universities, most of the time, academic units believe they need additional means to accomplish the job that should be done, or better still, to achieve even higher levels of performance.

Thus academic units are consumers of resources, divorced for the most part from the business side of the organization that collects and disburses funds. Numerous approaches have been devised to alter this situation, to give the consuming units incentives to produce more with less rather than the other way around.[4] But this relationship remains fundamental—and not particularly unusual: it exists widely among nonprofit organizations.

Nonprofit Organizations and the Pursuit of Knowledge

It would be strange indeed if higher education conformed to the free-market model in which competition drives down costs and achieves market-clearing prices. Colleges and universities offer highly differentiated products. Even where products are comparable, as they are for certain skills and credentials, competition is not entirely based on stated prices. The ease and convenience of delivery strongly affect the opportunity costs of consumers. Undergraduate education for young people, particularly in its traditional residential forms, shares few free-market characteristics. Besides being differentiated, it is a heavily subsidized service, involving third-party payers, that is appropriately located in public and nonprofit institutions.

Economists have had to develop a different conceptual lens in order to analyze nonprofit organizations. By definition, these organizations are forbidden to distribute surplus revenues (profits) to their officers or directors, but instead must devote their assets to their own stated purposes. Such organizations are clearly preferable to for-profit firms in cases where trust is a

paramount issue, as it is in higher education. An asymmetry of information exists between the provider and consumer, making the quantity and quality of the service difficult for the purchaser to evaluate. Because enrolling in a university is a long-term commitment with high transaction costs consumers should have confidence that the institution will not use its inherent advantage for its own profit. In addition, the nonprofit form creates appropriate objects of philanthropy in which donors can be confident that gifts will be used for their intended purposes.[5]

For these same reasons, theory holds, public universities too can be trusted not to take unfair advantage of their customers, but here another set of considerations predominates. The state has a powerful interest in assisting every citizen to attain a level of education commensurate with his or her inclinations and abilities. Just as full employment promises to maximize the production of goods and services, ***full education*** in this sense should contribute to maximizing the productivity and well-being of all members of society. In recent decades governments at all levels have implicitly acted on this theory, building colleges and supporting access to higher education for most who wish it. But the public provision of higher education is nevertheless circumscribed by what governments—and voters—regard as appropriate levels of expenditure. Individuals who desire different or more costly alternatives have in large measure looked to the private nonprofit sector.[6] Most private colleges and universities claim to offer education that is "distinctive" in some respect. Some of them also offer what is perceived as greater quality through ample provision of faculty, facilities, and amenities. Most of these institutions charge a high price, but much of their ostensible quality results as well from a high level of subsidization.

American higher education is subsidized in numerous ways. Public colleges and universities rely chiefly on state appropriations, but other forms of public support, including student financial aid, flow to both public and private institutions. Exemption from taxation is another implicit subsidy, predicated on a contribution to the public good. The capital costs of higher education constitute a huge sum that takes the form almost entirely of subsidy.

Throughout American history, students have rarely been asked to pay for the land and buildings in which they were educated.[7] Rather, governments and private donors have largely supplied such capital, leaving institutional budgets to reflect direct operating costs almost exclusively. Finally, American universities, like no others in the world, have reaped large subsidies from the beneficence of donors. Both current gifts and the legacy of past

gifts preserved as endowment provide subsidies in magnitudes that vary enormously across institutions. All these subsidies allow higher education to be priced below costs, thus contributing to full education and the resulting benefits to society. Conversely, one could say that subsidization allows far better higher education to be offered than most people could otherwise afford. This qualitative differential, or ***margin***, created by subsidization exists from community colleges to the Ivy League.

The instructional costs of any given institution can be expressed as the sum of what students pay for their education in the form of tuition and the amount of subsidy that is added. Together, the magnitudes of these revenues largely determine to what extent universities can accomplish their distinctive knowledge tasks. If higher education services were all the same, and offered at a market-clearing price, it would scarcely be possible for all of these activities to exist. Labor for instruction would be bid down to no more than minimal competence, complementary service activities could not be sustained, and no means would be available to permit the advancement of knowledge.[8] In fact, the margins that allow the proliferation of knowledge-related activities vary enormously across institutions. This margin of actual expenditures over a hypothetical market-clearing minimum makes possible the conditions that most distinguish universities—what might be called the overqualification of instructors, the generation of academic knowledge, and the synergies of multiple purposes.

The overqualification of university teachers is fundamental to universities as places of learning. It is also part of the distinctive character of faculty labor. The ticket of entry into the academic profession is the Ph.D., a prolonged, expensive, and narrowly specialized form of training for which the individual alone is responsible. Once employed in a university, faculty members are expected to devote their career to fairly well defined tasks predicated on their expertise.[9] The institution supports the further development of this expertise by supporting professional development, but chiefly by underutilizing the instructional capacity of its faculty.

In an efficient academic labor market, positions that afford the greatest opportunity for intellectual growth—the largest institutional investments—will be awarded to scholars who have the greatest promise to contribute to learning. Potential faculty members are in fact exhaustively evaluated on precisely this criterion. The eminence of the departments in which they did their graduate work, the recommendations of doctoral mentors, and initial scholarship all attest to a candidate's potential to advance knowledge in the field. Sponsorship plays a large role in fitting doctoral students for academic careers, but even those less favored can advance to more nurturing positions through the strength of their scholarship.

The process of fitting scholar and place is continuous. During the six probationary years that precede consideration for tenure, academics are expected to realize some of their promise. Universities that make the largest investment in junior faculty expect substantial and impressive accomplishments in order for tenure to be earned. Where less is invested, less is generally expected. This same process of measuring achievements against expectation, relative to the richness of the academic environment, continues throughout an academic career. The result is the development of expertise that far exceeds the minimum requirements of teaching all but the most advanced students.

Hence, tenured and also untenured faculty members know far more than is necessary to teach the largely codified knowledge that is transmitted in undergraduate classes. Universities acknowledge as much by liberally substituting less-qualified teachers—graduate teaching assistants or part-time instructors—for less-advanced courses. But overqualification in this sense allows faculty, as experts in specialized fields, to make more singular contributions in advanced instruction, in service to knowledge consumers, and in furthering knowledge in their field.

This bundle of activities is probably the most misunderstood and easily criticized feature of American universities.[10] It is also the basis of the remarkable ascendancy of the American university in the twentieth century. Rather than asking how it might be changed, one should first ask, why has it proven so effective? Faculty overqualification in fact enables the other two distinguishing university traits: the generation of knowledge and the symbiosis of multiple purposes.

The generation of knowledge in universities has an intrinsic value of its own. Universities are by no means the only place where new knowledge is discovered, but their role is distinctive nevertheless. The broad teaching mandate of universities requires the development and maintenance of a large repository of basic knowledge. Teaching sustains the nexus between the frontiers of knowledge and a more general disciplinary base. Academic expertise also reproduces itself in universities through the training of new scholars—the universities' special role. This process not only yields the next generation of experts, but also serves powerfully to stimulate creativity and discourage stagnation. To a significant extent, the value of academic knowledge attracts its own stream of resources, thereby enhancing the initial economic and intellectual base.

Considerable complementarities exist, for society and for individuals, in the multifarious activities based on this knowledge. Teaching, research, and application reinforce and fertilize one another in numerous, unpredictable ways. Research informs applications, but applications also raise questions or even findings that stimulate further research. Similarly, the organization and synthesis of knowledge for teaching provide feedback for application and research. Each of these activities, of course, is pursued by itself in other settings, and appropriately so. The rarified conditions of a university seem best fitted for pursuing systematic, theoretical knowledge. Efficiencies are gained when these activities are pursued in a complementary fashion. Individually, these three activities interpenetrate one another, often being performed simultaneously. Moreover, individuals with highly specialized knowledge can probably use their expertise more productively in a combination of different types of activities than by pursuing a single one, such as research or teaching, to the point of diminishing returns.

The deep expertise of faculty scholars, the intrinsic value of repositories of knowledge, and the complementarities of multiple knowledge tasks together constitute one ideal for the American university. However, the very nature of this ideal—its requirement of scarce resources—means that it can only be approximated by a relatively small number of institutions. The university system consequently forms an inherent hierarchy based in part on the capacity of institutions to fulfill these knowledge tasks.

A Dual Structure of Prestige

The American system of higher education is inherently hierarchical in ways that reflect much more than the national passion for rankings. Unlike continental European systems, where governments are constrained to treat all universities somewhat evenhandedly, the American system has been shaped by free student choice, uncoordinated distribution of federal and state support, and multiple sources of private support. This confusion of inputs and the resulting competition produce wide disparities among institutions of higher education, and thus a natural segmentation of tasks. Prestige, which is the subjective reflection of these hierarchical effects, is segmented as well. However, to the extent that institutions compete for resources, prestige has real consequences.

Prestige is also a slippery concept. Those who attempt to model the complex behavior of universities sometimes assume that institutions' actions are calculated to maximize prestige.[11] Taken literally, this notion is misleading. Universities seek to hire the best possible faculty, *given the salaries they can afford*; and they admit the most qualified students, *given the students that apply*. At this point universities essentially must play the cards they are dealt. The bulk of their energy is devoted to doing the job at hand, a large part of which is instructing students with the resources available.

In carrying out these tasks universities are scrupulously concerned with upholding their reputation—by maintaining academic standards and integrity in research, for example. However, there is little scope in these quotidian activities for "maximizing prestige."[12] Yet universities remain intensely concerned with reputation and prestige, and properly so. At the margin, consequential decisions about building, hiring, and fund-raising are likely to hinge on such considerations. With comparable universities behaving in identical ways, universities must continually seek improvement even to remain in the same relative position. This competition is played out in two principal arenas—one comprising the knowledge tasks described above, and the other reflecting the recruitment of undergraduate students.

University prestige based on faculty scholarship reflects the prestige structure of science itself. Recognition and rewards in science are based chiefly on how important or fundamental a contribution is to the field. As described by sociologists of science, the recognition and reward of scientists serve a crucial sorting function by ensuring that the most productive scientists will be given the most propitious places in which to work. That is, universities with the greatest resources will over time recruit and employ the best scientists. This process was monitored throughout the twentieth century. At the beginning of the century the first effort was made to identify the nation's most accomplished scientists. By noting where they worked, a ranking of universities could be had as well. Since 1960, four systematic assessments have been conducted to determine the prowess of academic departments for research and, concomitantly, graduate education (in 1966, 1970, 1982, and 1995). In these ratings, the expertise of individual faculty members is aggregated into a rank ordering of departments in each academic discipline and, by implication, for whole universities.[13]

Other indicators are employed to gauge a university's research role. Total expenditures for research, or for federally supported research, provide a volume measure for separately budgeted research (that is, virtually all research in the sciences). Data on the number of faculty publications and how often they are cited can also be used to gauge the productivity and influence of the faculty.[14] These measures, to be sure, are relevant to a limited number of institutions. The Carnegie Classification of 1994 designated 125 insti-

tutions as research universities; 120 universities expended 85 percent of the funds budgeted for academic research; and a like number had more than ten departments deemed worthy of evaluating in the 1995 ratings. But among these universities, measures of research and scholarship reflect substantial differences in relative capacity to fulfill those fundamental knowledge tasks of a university.

The largest single task of American higher education nevertheless is undergraduate education, and institutions are sharply differentiated according to their respective roles. This prestige hierarchy is based implicitly on the attractiveness of an institution for the nation's most able secondary school graduates. Attractiveness translates into selectivity, which can be and is measured. Dozens of commercially published college guides rate institutions according to the number of applications, percentage of applicants accepted, and the proportion of the latter who matriculate. The greatest importance is accorded to the collective qualifications of those matriculates—their standardized test scores, high school grades and standing, and other accomplishments. Although guidebooks have no difficulty scoring institutions by these criteria, this hierarchy too has its ambiguities.

Selectivity has different implications for public and private institutions. Private colleges and universities for the most part have far smaller first-year classes and thus can set a higher standard for admission. Selectivity is far more consequential for them as well. For private colleges and universities, selectivity is tantamount to market power. Large pools of qualified applicants translate rather directly into revenues and resources needed to support fundamental knowledge tasks. Of course, liberal arts colleges typically eschew a large portion of such tasks, most of them being too small to excel in laboratory sciences or to sustain doctoral programs. For private universities, however, prestige in undergraduate selectivity is closely associated with financial and academic strength.

For public universities as well, academic strength serves to attract high-ability students. But with large first-year classes, these institutions are inherently less exclusive. The profile of undergraduate students at a given state university varies according to its educational role in the state. The size and the quality of the applicant pool contribute to the prestige of a public university, but they have less direct financial impact. For all these reasons, state universities have more variable commitments to undergraduate selectivity even though they attract a large share of high-ability undergraduates.

The prestige hierarchies for public and private universities are somewhat asymmetrical. Nevertheless, universities in both sectors are similar in being

dedicated to core knowledge tasks, in their compartmentalized structures, and in their multipurpose natures. Thus they all crave most of the same scarce resources to fulfill their missions. How these resources are distributed is a fundamental feature of the American system of universities. Moreover, imbalances in the distributive mechanisms can provide the motive force for evolutionary change.

Universities in the Marketplace

When universities and markets are mentioned together, the subject is usually university ventures into the commercial realm: patenting and licensing, developing real estate, or taking equity positions in new firms.[15] A note of disapproval often accompanies the participation of not-for-profit universities in markets predicated on profitable returns on investments. As controversial as commercial undertakings have been, they still represent a tiny portion of all university activity. Conversely, the universities' core functions involve markets that are largely internal to higher education—markets for students, faculty, and key university resources.

Markets in this sense are systems for the allocation of scarce resources. In the economic paradigm of a free market, resources are allocated through the price mechanism, subject to the discipline of supply and demand. In higher education the basic outputs of teaching, research, and service are heavily subsidized. Prices are consequently poor signaling devices. With instruction in most cases underpriced, for example, demand should in theory exceed supply, and under certain circumstances it does. In that case, rationing must be introduced into the allocation process. Institutions—the sellers—have the power to choose their customers; students—the buyers—become supplicants. In this inverted relationship prices play a different role.

In such a market, supply and demand do not set a market-clearing price, but they are by no means irrelevant. Imbalances between supply and demand generate ***market forces*** that have significant consequences for the allocation of resources. In higher education, prices seldom change dramatically or rapidly. Most prices are adjusted only once for an academic year. Higher education prices thus tend to be "sticky," but they are nevertheless affected over the long run by the sway of market forces.

Taken as a whole, higher education is a mixed, not a market economy. Governments supply a large portion of revenues. Income from endowments in theory gives some institutions a degree of independence from market pressures. In the language of nonprofit organizations, universities

are both donative and commercial enterprises in the ways they derive their revenues. But universities need other resources too. The allocation of human resources creates markets internal to higher education. Moreover, these are virtually zero-sum situations, where institutions must compete for shares of finite resources. These areas are seldom analyzed in market terms, but market forces substantially affect them.

Doctoral education, particularly in the sciences, represents one of the most perfectly competitive markets in higher education. Each winter a limited number of students with the requisite qualifications apply to those science and engineering departments that they would most like to attend and that would be most likely to accept them. The applicants are highly informed about the training they seek, and they are highly mobile as well. Each department is a small, autonomous producer, and the departments in each subject area collectively form a national market. Except for pricing, doctoral education approaches the requirements for perfect competition.

Doctoral students are a necessary input for university science departments, serving as research and teaching assistants and sustaining doctoral programs. For that reason, almost all of them are supported while undertaking their studies, in most cases with full tuition, some benefits, and a livable stipend. Each spring this market clears as participants work out the best match between applicants and departmental offers.

The key feature of this market is that the quality of both applicants and departments varies in ways that are fully understood by both parties: applicants and departments can therefore be ranked according to desirability. Thus a dual competition takes place—departments seek to attract the most preferred students, and students seek places at the most preferred departments in their field. This situation produces a ***queue and overflow*** process of allocation. Top departments choose, and are chosen by, the best students; departments in the next tier do the same with the remaining students; and so on down the list. However, this market is highly competitive and the terms of competition fairly delimited. Even top departments could not attract the students they wanted if they offered too low a price; nor can top students bargain for a stipend much above the norm. Nevertheless, over time the interplay of market forces affects the terms of this competition.

Since the late 1970s the supply of qualified students seeking doctoral education in the sciences and engineering has tended to be less than the number of places potentially available for them. Market forces, in other words, have favored the applicants, with evident consequences. One effect has been

a substantial increase in the number of international students. Universities have thus enlarged and improved the supply of qualified applicants by substituting highly qualified international students for lower-ranked (or nonexistent) domestic ones. The number of doctorates granted to foreign nationals tripled from the late 1970s to the early 1990s, exceeding 50 percent of graduates in engineering and 30 percent in the natural sciences. A second development has been the gradual improvement of the support packages given to doctoral students. As they competed for better students, departments lengthened the time of guaranteed support and increased the value of stipends.

The markets for professional schools—medicine, dentistry, law, and to some extent business—resemble those for doctoral studies, at least for institutions serving the national market. Regional and local markets exist as well, where location strongly affects recruitment, but in the national markets the queue and overflow process predominates. Top students are certainly prized, but professional schools are less likely to pay students to attend. Rather, the prevailing assumption is that students embarking on presumably lucrative careers should themselves pay for much of their training. Demand for places in professional schools has waxed even as interest in doctoral programs waned (the result of another set of market forces). Market forces since the 1970s have thus favored the purveyors of professional training. Their reaction, it would seem, has been to gradually increase prices. Tuition to professional schools has accordingly risen well above that charged for undergraduate or graduate studies.

The vast market for undergraduate education is less easily described. It is segmented by geography, by type of institution, by mode of attendance, and above all by the level of academic rigor. The picture can be simplified somewhat by looking only at beginning freshmen—overwhelmingly recent high school graduates—attending four-year institutions, nearly all on a full-time basis. Here is a market that clears each spring as high school graduates match themselves with colleges befitting their aspirations and accomplishments.

This market has been remarkably stable since the middle of the 1970s in terms of institutions and enrollments. More than one-third of four-year students have consistently chosen to attend private institutions, for example. But more surprising, nearly the same number of freshmen, between 1.1 and 1.2 million, has enrolled each year for a quarter-century, even though the number of high school graduates has fluctuated from 3.2 million down to

2.3 million and back to 2.8 million (1998).[16] This fact strongly suggests that freshman enrollments at these institutions are in the aggregate largely determined by the supply of places.

The supply of students for four-year colleges is not limited to recent high school graduates. An immense pool of students, nearly 4 million in 1997, attends degree programs at two-year colleges either full- or part-time. Only a small portion of these students makes the transition to baccalaureate-granting colleges, but they more than compensate for attrition among freshmen at those colleges. The number of undergraduates at four-year institutions has crept upward since the mid-1970s at a rate of 1 percent per year. The number of bachelor's degrees awarded annually—the output of American colleges—has grown at a barely higher rate. The expansion of American higher education was extremely slow from the mid-1970s to the mid-1990s, although it seems to have accelerated somewhat since then.

It is difficult to reconcile the notion of supply constraints with some readily apparent conditions. Unused capacity obviously exists among many nonselective colleges and universities, from struggling liberal arts colleges to stagnant regional state universities. But much of this supply of places may not correspond geographically, vocationally, or culturally with existing demand.

In the large middle of American higher education, most of those colleges and universities fortunate to have more applicants than places have generally chosen to increase the qualifications, rather than the number, of the students they admit. This behavior is consistent with the prestige attached to selectivity, but it usually makes sense financially as well. To extend enrollments beyond an optimal point requires extraordinary expense for additional space or personnel—a jump in marginal costs. Extra expenditures might better be devoted to improving conditions for existing students, particularly in ways that enhance prestige. One cannot generalize across hundreds of institutions, each of which carefully evaluates when, where, how, and which additional students might be accommodated, but the calculus on balance has not favored expansion.[17]

The highly selective sector of higher education resembles in a more complicated way the market for doctoral and professional education. That is, institutions compete for the most talented applicants, and applicants compete for the most coveted places. One might envision a number of queues: for liberal arts colleges, private universities, top state universities, and engineering schools. On the institutional side, colleges and universities do not choose students on the basis of a single criterion, but rather act as if they

had multiple lists of desirable characteristics. Their goal is to form a class of students with strong academic skills, but also one possessing a diverse range of talents and qualifications. Needless to say, the process of queue and overflow is complex, and so are the market forces that it generates.

The number of applicants seeking places in the highly selective sector is an important market factor, but one that can only be inferred (see Chapter 3). Nevertheless, the demand for places in this sector has been indisputably robust during the current era. Moreover, since the desire of students to attend a particular institution tends to increase with its prestige, this pattern produces strong demand for the peak institutions even while colleges at the ill-defined lower boundary of this sector struggle to attract students of the caliber they would prefer. Conditions have thus been favorable for the peak institutions—the pricing leaders—to consistently raise tuition. Selective private institutions and to some extent public universities implemented a high-tuition/high-aid policy, which is explored more fully in the next chapter. Most noteworthy, this development raised the stakes in the selectivity competition, as Chapter 3 explains.

In the dual prestige structure, private institutions have far more at stake in the competition for selectivity. For liberal arts colleges, selectivity corresponds with both public reputation and financial strength. For private universities, the selectivity of the undergraduate college similarly contributes to the prestige and viability of the institution. And public universities more recently, refusing to concede superiority in this area to the private sector, have recruited top students more actively. In the 1990s, all these institutions became increasingly preoccupied with selectivity. In a case of theory following practice, the scholarly literature identified student peers as a crucial input in the educational process. Hence a college's selectivity is predicted to have a material effect on educational outcomes, upping the stakes for applicants. As the competition of colleges for students and students for colleges intensified in the 1990s, the financial consequences of selectivity appear to have grown as well. Universities reacted accordingly.

Universities adjust the emphasis they place on their multiple ongoing activities. The operating budgets may reflect incremental shifts in emphasis, but decisions to launch new programs or undertake new investments are telling indications of current priorities. During the 1990s, universities largely responded to the intensifying competition for the most desirable undergraduate students by increasing investments in this area. To some extent this included undergraduate education, but the larger stimulus and response concerned admissions and selectivity. The characteristic student-cen-

tered university of the 1990s focused primarily on the recruitment of desirable undergraduate students, which has now become the most competitive market in higher education.

The student-centered university has had ramifications for the other markets in which universities compete: those for faculty, research funds, and other sources of institutional support. Indeed, the expressions and implications of these market forces are the subject of this book. The common feature of all these markets is the compulsion they exert over university behavior. The actions of all market participants create conditions that severely restrict the range of choice and action for any individual institution—Adam Smith's invisible hand. One might demur from this view by pointing out that American higher education has always been decentralized and competitive, and that institutional behavior has also been highly mimetic. To some degree this is true. However, the new conditions reflect a significant change in the degree of competitiveness. The current era and the present marketplace had their origins in the confluence of trends and events at the start of the 1980s.

The Era of Privatization

In order to understand the reorientation of American universities that occurred around 1980, one must first appreciate the malaise of the 1970s. That decade marked the culmination of a trend of expanding governmental coordination in American higher education that extended back to the 1930s. More immediately, the preceding decade had experienced an unprecedented expansion of public investments ranging from scientific laboratories to work-study subsidies for needy students. The final touches of this system were completed early in the 1970s: state and local governments largely finished constructing a nationwide array of community colleges; and the federal government offered long-promised systemic support for higher education in the form of need-based financial aid, enacted in the 1972 Amendments to the Higher Education Act. But with these last large efforts the trend was exhausted. Relative increases in government outlays to higher education could no longer be sustained, and perhaps no longer be justified. And, as predicted by early critics, government money was followed by greater government interference.

To add to the woes, after 1975, for the first time in U.S. history, enrollments in higher education ceased to grow. Economists, scanning the diminishing size of college-age cohorts and the shrinking wage premiums of

college graduates, confidently predicted that enrollments would decline in the years ahead.[18] Finally, persistent high inflation eroded university assets.

From the early 1970s to the early 1980s, real educational expenditures per student declined for higher education as a whole. Personnel were most severely affected as the salaries of faculty and administrators lost 20 percent of their value from the previous peak. As higher education lagged behind the inflation-ridden economy, it became more affordable, at least in inflation-adjusted dollars, in the public sector and throughout much of the private sector as well.[19] Universities in general probably weathered these conditions better than other institutions of higher education, but they too experienced intermittent crises. Private research universities had expanded with alacrity during the golden age of burgeoning federal research support, but then spent much of the next decade making painful adjustments. For public universities, the worst fiscal squeeze occurred around 1980. In both sectors the response was to reduce commitments and pare back costs. Retrenchment was the watchword, hiring freezes a common experience.

Even as universities struggled to balance their individual budgets, the overweening presence of government dominated their outlook. From the federal government came a stream of regulatory requirements covering matters from accounting to affirmative action. Besides having to cope with the rising prices of the goods and services they purchased, universities had to devote a larger share of shrinking revenues to administrative tasks. Among the states, "coordination" was in the ascendancy: if each institution could be restricted to its own sphere, the conventional wisdom held, "waste and duplication" might be extirpated. In sum, not only had the environment for higher education turned harsh, but government policies, to which universities were now bound, were no longer benign.

The beginning of the 1980s witnessed the kind of shift in the zeitgeist that is more readily described than explained. The size and scope of government's role continued to be vigorously contested, but the preponderance of opinion gradually tilted from government-sponsored solutions toward less government as the solution—from nationalization to privatization. Internationally this conflict was perceived as the crisis of the welfare state. In the United States concern focused on the declining competitiveness of industry, allegedly caused by too much government and too little research. The elections of Margaret Thatcher in the United Kingdom and Ronald Reagan in the United States enshrined and advanced this transformation. Both leaders were also monumentally unpopular on the campuses of their respective countries. Accordingly, a catalyst was required for priva-

tization to take root in American universities. That role was filled by the great American inflation.

From 1978 to 1982, inflation eroded one-third of the purchasing power of the dollar. Although this development wreaked obvious hardships on universities and especially on their employees, it also affected behavior and attitudes. Hardly decisive in itself, the inflation had the subtle influence of tilting universities and their clienteles toward new, privatizing, courses of action. The most significant developments were the rapprochement between universities and private industry, the aggrandizement of university management, the renewed popularity of elite institutions, and the transformation in the financing of a college education.

In the early 1970s, relations between universities and industry reached low ebb. The radicalism that had set the tone of campus discourse in the preceding years evolved toward a self-serving concern for social justice, dedicated to criticizing rather than cooperating with capitalist firms. Links with industry nevertheless persisted in places like chemistry departments, engineering colleges, and medical schools, where ties with professional practice outweighed ideology. These ties tended to strengthen in the following years, but three developments at the decade's end transformed university attitudes.

First, the well-publicized crisis of economic competitiveness argued for a greater investment in academic research by industry and better means for transferring the fruits of academic research to the commercial sector. Second, this case was powerfully reinforced by the emergence of biotechnology. Here was an example of basic academic research that was directly relevant to the development of pharmaceutical and agricultural products. As university biologists formed or joined biotech firms, commercial links were forged that universities could scarcely prevent. Third, the increasingly apparent success of those universities that had become active in patenting or had established research parks formed another kind of compelling example. For universities, starved for revenues by the great inflation, greater cooperation with industry and even direct participation in commercial ventures seemed to promise much-needed income. Harvard president Derek Bok spoke for his counterparts when he noted that such windfalls could "stir the blood of every harried administrator struggling to balance an unruly budget."[20]

Campus opinion tended to remain skeptical, if not actually hostile, but the elements fell in place for university involvement with commercial firms and in commercial markets: the strong vested interest of faculty in the relevant fields, administrative leadership in creating new organizational units for this purpose, and soon government policies to subsidize university-industry cooperation.

An influential book in the early 1980s reported that a "managerial revolution" was taking place in American higher education. Universities belatedly recognized management as "a body of knowledge and techniques indispensable for any complex organization."[21] In the B.C. era (before computers) universities were rudimentary organizations, particularly in financial and administrative support services. This changed in the 1970s as the scope of these activities ballooned. Regulatory and reporting requirements increased administrative chores enormously. Large offices had to be maintained for "grant and contract administration," for "student financial aid," and for far more complicated budgetary operations.

The financial crisis prompted more fundamental changes in management. In order to understand and gain control over their financial predicament, universities resorted to a new dimension of managerial analysis. Consultants were brought in and computer programs deployed, but more far-reaching, strategic planning in some form became the new managerial imperative. This development occurred sooner and more thoroughly at private universities, as they were forced to deal with looming financial crises.

An additional change largely followed the managerial revolution. A new standard of economic rationality tended to pervade university decision-making. This was most visible when universities privatized inefficient operations, like bookstores. But many more university units were now expected to pay their own way. As a further ramification of these trends, significant portions of university affairs were withdrawn from faculty influence. As one manager explained his five-year plan: "naturally, we regretted not having faculty endorsement. . . . Anyway, ours by necessity is not a bottom-up planning process. It is a top-down process."[22] Going forward, the new managerialism facilitated the implementation of privatizing policies from the top down.

In the cynical climate of the 1970s a thorough liberal arts education in a residential setting was no longer held in high regard. Students were encouraged to "stop out" of college in order to learn from experience or, conversely, to graduate early by attending summer school, thus saving money. The decade also witnessed a pronounced swing of graduates toward vocational majors. Plummeting credentials among prospective students jeopardized traditional liberal arts colleges further.[23]

The prospects for the 1980s appeared even more dismal for these institu-

tions, but they were not borne out. Key factors began to change. The earnings differential between high school and college graduates began to widen, raising economic incentive. Students, perhaps sensing the effects of inflation (or the apparent glut of college graduates), adopted more materialistic aspirations and corresponding educational strategies. Selective colleges, for their part, responded to their straitened circumstances by redoubling recruitment efforts with more staff, more direct mailings, and market analysis. Among prospective students, interest in the leading private colleges clearly grew. The behavior of applicants became more aggressive too as they began sending multiple applications to preferred colleges.[24] Perhaps most remarkable, demand rose at the most expensive institutions despite rapidly rising tuition.

The years of the great inflation marked a restructuring of the way Americans paid for college. The system of federal student financial aid enacted in 1972 established two types of need-based grants, one for basic support (now called Pell grants), the other to help pay for attending more expensive institutions. A program of subsidized loans was intended to back up this core aid for students with additional, extraordinary needs. As inflation pushed the nominal costs of attendance higher, however, this system came under intense political pressure to offer succor to the middle class. The Middle Income Student Assistance Act of 1978 addressed this alleged "squeeze" on families who were neither aided nor affluent by removing the income ceiling for guaranteed, low-interest loans. Interest rates in the economy soon shot upward, creating a situation in which both lenders and borrowers could profit handsomely from the government's generous terms. The volume of loans increased by 60 percent in real terms in just three years. Moreover, the number of borrowers ballooned as well. When the provisions for federal student loans were subsequently tightened, neither borrowers nor loan volume subsided. At these new higher levels, loans overshadowed federal grants as the largest form of student aid.[25]

At virtually the same time, the leading private universities shifted their policies slightly but significantly. Harvard and other Ivy League colleges raised tuition aggressively to cope with their financial straits. In keeping with their strong sense of social justice, however, they also assisted needy students with additional financial aid, ostensibly from their own fisc. An open window for federal loans after 1978 greatly facilitated this approach. Thus the high-tuition/high-aid strategy was born out of a subtle adjustment of institutional practice and reinforced over several years by relentless inflationary pressure. By appreciably raising the tuition ceiling, the pricing leaders provided other private colleges and universities ample headroom to boost their charges too. In the years following, the logic of this situation was steadily realized.

Thus when something like prosperity returned to American higher education in the mid-1980s, the system itself had materially altered. Conditions were ripe for raising university prices and university expenditures. The latter could be used to increase the attractiveness of institutions for preferred undergraduates. Additional spending could also be used to enhance the internal research capacity of universities, which in turn fortified the newfound goal of contributing to the economy. And if these signposts were not clear enough, university operations were now directed by a new group of managers with the skills and authority to read the signs and set the course. What this new era produced is the subject of the chapters that follow.