

Toward A Theory of the Market for Higher Education

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ABSTRACT

A rich tradition in economics is the examination of issues in the economics of higher education. The most prominent members of the profession are associated with universities: it would be surprising if higher education were not a frequent object of professional scrutiny. On the other hand, most of that literature focuses upon issues in higher education or classroom and course content or the economic effects of higher education; very little examines the university as a firm or the market for higher education. These latter subjects are natural objects of professional interest. However, the nature of these firms and their market presents difficulties that complicate any economic analysis. This paper suggests a “matching” model of the market for higher education which captures some of these complications and reflects several of the industry’s stylized facts. It considers the objectives and structure of the industry and its firms which is less obvious than that for industries such as manufacturing. It also notes other complications such as the public goods nature of its most important outputs, its interest in generating significant excess demand, the relatively minor role of pricing and the major problem of bilateral asymmetric information. It suggests an extension of the market idea to an international higher education market, which may be emerging in Europe, where additional issues such as the inefficiency of the lack of a common language and the clash of intellectual traditions become relevant.

INTRODUCTION

Despite their widespread participation in the enterprise, economists have not settled upon the fundamentals of the economics of higher education. While we have an extensive literature on some of the issues raised by higher education, such as the returns to education, we still lack an acceptable and fully developed model of the university. In the sense that it “commands” resources that are organized to produce something, it resembles a firm; but it is

unlike a business in so many ways (e.g., Marks, 1998) that the literature on firms still leaves us with a limited understanding of this important industry. One of the most prolific analysts of the industry describes its economics simply as “awkward” (Winston, 1999).

What ideas motivate this discussion? One is the nature of a market for education. What are the elements of such a market? What are some of its unique characteristics? Another is the existence of a kind of persistent hierarchy in higher education (Winston, 1999) along a number of dimensions, one of the most prominent being access to “donative resources”. Rather than think of one market for higher education, we find a variety of markets. Universities do not see their competition as all other universities but instead seem to segregate themselves into “clusters” or bands with some common characteristics such as size and location. We often hear administrators declare that “we are not trying to compete with...” or “We cannot be and/or do not want to be a [insert the name of some “remote” and prestigious university].” This may be most easily understood in the public/private distinction, although this example is not foolproof. Some public schools are more like the Ivy League than like most other public schools; some private schools seem much more public (e.g., oriented toward training large numbers of students for jobs).

It is also unlikely that all universities are pursuing the same ideal like all firms in the same industry. They all would like the resources and prestige of the “best” schools, but generally they are not simply emulating those schools. There exists a vague sense that the better schools could accomplish the mission of the lesser schools but not *vice versa* and similarly for better students and faculty and their lesser counterparts. However, that is not

clear. Working with a state legislature, recruiting from local high schools, and attracting and retaining first-generation-in-college applicants takes skills that may not correlate highly with the characteristics of the most prestigious schools.

Another is the question of whether the relevant markets are in equilibrium. It is easy to see why a firm may strive to make more profits but also relatively easy to see if its market seems close to some equilibrium. Are prices stable? Are there dramatic shortages or surpluses? Are many firms entering or leaving in a given year? Are there many mergers, acquisitions, and divestitures?

This is more difficult to determine in the market for higher education. Indeed, it would be difficult to answer any or most of the questions for that market; and any evidence of equilibrium or disequilibrium could have many explanations that may not relate much to the behavior of competitive markets. The rationale for university pricing is not apparent other than a vague sense that nominal prices (e.g., tuition) tend to rise over time. The composition of the industry seems remarkably stable (universities advertise how long they have existed, and age seems to correlate with prestige); and entry, exit, mergers, and acquisitions (we do not find many divestitures) seem motivated by non-market forces—certainly something other than profitability.

Similarly, students segregate themselves into submarkets. Faculty members may agree widely on the “best” universities in the country or the world; but students, with their more diverse interests and motivations, probably would not; and they may have difficulty explaining their choices. The vast majority of college students celebrate the fact that they do not attend the most prestigious schools (and some students and alumni of those schools regret being or having been there). Obviously, student athletes have a different ranking from student physicists.

SOME IDEAS FROM THE LITERATURE ON THE ECONOMICS OF HIGHER EDUCATION

The economic literature on the market for higher education is sparse. However, we can identify some characteristics that have been recognized.

Characterizing as market-driven the process by which we produce tertiary education in a society strikes many as illegitimate. For many, universities are institutions, like courts and legislatures, that must exist to perform an essential function in society. Poorer societies may be unable to afford their own, though most do, so that they must “sub-contract” that function to foreign universities, but few of us doubt the necessary role they play. However, we acknowledge our tendency to specialize in productive activities that we perform relatively well and to trade with others for goods and services we do not produce for ourselves, and few of us would deny that market-based allocation is a legitimate method to serve that purpose. Reluctance to link tertiary education with markets may reflect, legitimately, our concern that the ideals of the university may not be best served by market-based allocation driven by a profit motive.

Even in the United States, the idea of a market for education meets resistance because of the incompatibility between profits and university ideals. A recent analysis of the “industry” focusing upon undergraduate education (Zemsky, Shaman, and Shapiro, 2001) documents how the problem of maintaining enrollments of qualified students in the 1970s was seen first as an admissions issue but then recognized as a failure to understand the market for undergraduate education: “We now know, although frankly did not appreciate then, that the key to solving the admissions puzzle was a broad understanding of the market for postsecondary education...” (p. 1) The authors note early that “the market now matters in higher education”. In fact, it always has. What has changed in many countries is the

manner in which universities are funded so that “increasingly the outlook of universities in the United States is indistinguishable from that of business firms” (Posner, 2002: 21).

The university serves a variety of markets and buyers; as the seller, it must act in some ways like a traditional business firm. While characterizing universities as firms raises concerns if we equate that to profit-maximization (e.g., Marks, 1998), we know that universities produce valued products which some members of society are ready, willing, and able to purchase. The products must be rationed somehow—by price, merit, lottery, and/or queue—and should be produced at lowest cost.

However, it is important to recognize some fundamental differences between the production of, and the market for, a consumer or capital good and the market for tertiary education. Finding a distinction is difficult when we consider some of the university’s products—research on commercially viable products, vocational training, entertainment, housing, retail book sales. These products do not require a university and are just as easily provided by private firms. Universities produce them, inappropriately sometimes, because they make money or because a benefactor (perhaps the state) subsidizes production as a matter of social policy or benevolence.

On the other hand, profit-driven private enterprise will not produce efficient levels of goods whose production is unique to universities—new knowledge, the development of non-vocational intellectual skills, nonpartisan analysis of the goals and behavior of the state and other seats of power, and the intellectual processes (i.e., academic standards) that yield these products (Marks, 2002). These products and processes are public goods—unlike the goods typically provided by private enterprise, these public goods can be enjoyed (“consumed”) simultaneously by many consumers at one time, and it would be difficult to deny anyone access to them. An example is knowledge: it is a good—it confers benefits upon its consumers—and its consumption is

non-rival and costly to prevent, at least for a motivated consumer. Because they have these characteristics of non-rival consumption and costly or impossible exclusion, public goods cannot be sold like products to buyers: this is the “free rider problem”.

Consider the university as a multi-product firm: it can produce several products (e.g., vocational education, football games, new knowledge, housing). This firm has production possibilities: it can produce various combinations of outputs just as General Motors can produce a variety of models of vehicles. Of course, for most of the firm’s products, producing more of product A requires reduced production of product B. If it is going to introduce A or produce more A, then the revenue from the resulting change in A sales must more than offset the revenue lost from (along with any increases in direct outlays) reduced B production and sales unless A’s production is subsidized. This is how the firm makes and maximizes profit or at least maintains profit and minimizes losses. However, the university faces a unique problem: the aforementioned products that are unique to it may generate little if any revenue because they are public goods—certainly not enough to yield efficient production. Thus, if it must maximize profit, the university faces a persistent struggle to produce those products unique to it. Profit pressures push it persistently to produce goods not peculiar to the university—that make it look more like a business than a university.

Traditionally we have protected the university from the need to maximize or even make profits by providing it with significant subsidies—government funding and private donations. However, nothing requires that these continue. Indeed, financial support of public universities as a percentage of total revenue has been declining in recent years (e.g., Winston, 1999: 30; Zemsky, Shaman, and Shapiro, 2001: 11-20) so that they may be pushed increasingly to be more profit-oriented—and to move farther from providing products unique to universities. Since they are

tax-exempt, they have a considerable, and perhaps unfair, cost advantage competing in these markets.

Another peculiarity of this firm is that it seeks excess demand for some of its most important products such as places in its classes. Rather than auction those to the highest bidders—that is, pure price rationing—it strives for considerable excess demand at the prices charged (i.e., tuition, which may be zero) and uses merit-based rationing to determine who is admitted. Throughout the world, a university's degree of selectivity—how many potential buyers per seat available—is a popular measure of educational quality. No other industry values lost sales so much. One feature of the university's peculiar production function is that such selectivity—achieving significant excess demand—is efficient because a university is a prime example of production where the “customer” is an input (Rothschild and White, 1995; Winston, 1999: 23-5; Posner, 2002), and measures of academic potential and achievement are better indicators of customer quality than ability to pay for admission.

Winston (2000) has also suggested that, unlike the behavior of firms in a competitive market where long-run profitability is the condition necessary for survival and a firm's relative performance is captured, broadly, in the ranking of its return on investment, firm behavior in the higher education market resembles an arms race. A school's reputation is a positional good (Hirsch, 1977): much of the value depends upon how one ranks relative to the competition. The firm's goal is to increase its ranking among competitors because this increases its appeal to the best quality applicants for admission who, in turn, enhance its reputation if they matriculate. Unlike a competitive industry, an arms race has no long-run equilibrium—even theoretically: “The end of an arms race can come through an agreement to stop the competition, an agreement reached for the common good or imposed externally, but any agreement...is inherently fragile as long as individual advantage accrues to its violation.” (pp. 15-16)

While not comprehensive, this discussion illustrates the nature of the market for higher education, some unusual but significant characteristics of the market's suppliers, and universities' increasing market orientation.

A MODEL OF THE MARKET FOR HIGHER EDUCATION: “CONSUMER PREFERENCES”

Consider the following model of the market. For simplicity, we shall assume that the only function of the university is to provide a particular kind of education—“higher education”—to students. The suitability of the student to that kind of education helps explain differences in preferences. We shall assume that students are heterogeneous and have differing tastes for that education. A student's utility function is given by

$$U = U (E, F; t)$$

where E is the quality of university education she receives, F is the number of “effort units” required to obtain E, and t represents the student's taste for higher education. An effort unit here is the quantity of student “contribution” to her own education and thus is a blend of time, intensity of effort, and ability.

We shall also assume, for simplicity, that E translates directly into the present value of income and/or units of a composite commodity, which may include intangible goods such as “the pleasure of learning”. U (-) is continuous and twice differentiable; U_e is positive; U_f is negative so that F is a “bad”. We can draw an indifference curve (IC) from U(-) as in Figure 1 that indicates that, for a given value of U (say, U_0), IC_0 has a positive and increasing slope: a given student is indifferent among various combinations of E and F and must be compensated for greater F by receiving greater E. We see also that ICs to the northwest indicate higher levels of utility.

We can identify different types of students with different ICs. Label our first student X whose representative IC becomes $ICo(x)$. Furthermore, Y is a student who finds E more intrinsically rewarding and would have an ICo like $ICo(y)$ in Figure 1 where we have included the original ICo as $ICo(x)$. A third type of student, Z, is even more motivated and is represented by $ICo(z)$. To understand the representation, notice that each type of student has an indifference curve through point K, which indicates that each of the three students identified is providing effort level F_k and receiving education level E_k . Each student's marginal rate of substitution (MRS) at that point equals:

$$dE/dF = \text{abs}(- (U_f/U_e))$$

where $- (U_f/U_e)$ is positive since U_f is positive but U_e is negative.

From K, X has a larger MRS than Y: the educational (and income) payoff from greater effort must be greater for X than Y. Z's indifference curve through K reflects a requirement of even less E-reward for a given increase in effort than is the case for either X or Y. Given F_k , student Z requires the smallest educational increment to justify another unit of F among the three students; alternatively, one can say that, given F_k , if Z had more E (i.e., was on a higher indifference curve), then her MRS would be greater, a reflection of diminishing marginal utility from E.

What determines a student's MRS at a given level of effort? A variety of factors may operate. Some students simply find education more intrinsically rewarding: they require less "external" reward for a given level of effort than others. Perhaps they "trust" education more in that they do not need to see as much learning to justify expending another unit of effort (compare academics with high school dropouts), or their experience suggests a more reliable return on investment in education (compare white with nonwhite students). Students also vary in the extent to which they

think of education as an investment in contrast to consumption: do you choose courses and a major because you enjoy them or because they teach skills that are more saleable in the labor market?

One can also think of the different types of students as having different marginal rates of time preference (MRTP). If we think of the E-F analysis as reflecting a defined period in a person's life, then the MRS may represent different rewards required within that period to warrant providing another effort unit. Students who are more willing to defer gratification (less positive MRTP) require a lower E increment for a given F increment to remain indifferent. This reflects the empirical evidence of a negative correlation between discount rates and student performance (e.g., Kirby, Winston, and Santiesteban, 2002).

While we have considered only three types of students, we could assume that S varieties exist.

THE UNIVERSITY TECHNOLOGY

We assume that the university's goal is to maximize reputation (R), and its reputation depends, first, upon the educational quality it provides (E) and the efficiency with which it delivers that education—that efficiency is reflected in the educational return that students receive, through the university's production technology, as a reward for their effort units (F). The different technologies (T) available further serve to identify the different types of universities:

$$R = R(E, F; T)$$

where R is continuous and twice differentiable. R_e is positive (reputation increases with educational quality), and R_f is negative (a school's reputation suffers as it becomes more difficult for students to get a given increment of education for another unit of effort).

A given university can provide more education with more effort, but its production

function affects the returns to extra student effort. We certainly expect that more effort yields diminishing returns at a given university: as a student expends more effort, it becomes increasingly difficult to increase the quality of that student's education. She will be limited, for example, by the quality of the faculty (e.g., their training, their time to provide extra help, their motivation); the quality of the facilities (e.g., the library and computing resources); and, in the spirit of Rothschild and White (1995) the quality of her fellow students and the challenges and complementarities they can provide.

This characterization of the university's production is reflected in the iso-reputation function $IRo(a)$ shown in Figure 2 for university A. It indicates a diminishing marginal return to effort at the university. Iso-reputation loci to the northwest indicate better reputation for a given technology: a better education outcome for a given level of effort. Relative to effort-education bundle L, another university (B), with a more efficient educational technology, would provide a greater educational return to another unit of effort: university B may have better instructional staff and/or a student body that stimulate more intellectual curiosity and more learning and/or an infrastructure more conducive to learning (e.g., more extensive library, more computing support). Its iso-reputation locus through L is $IRo(b)$. University C is even more efficient at that effort level with an even greater increment to E for a given increment in F: it uses a technology that rewards effort even more. $IRo(c)$ represents its technology: at effort level Fl, it yields a larger educational increment than either A or B.

Another basis for expecting differences in the educational return to effort units recalls the idea of academic standards as public goods. More pervasive free-riding diminishes academic productivity; schools yielding a greater E increment may have a technology less susceptible to free-riding and thus more efficient.

It is important here not to equate reputation with educational quality. The shape

of the iso-R curves indicates that, from the market's standpoint, a given reputation (a kind of "community appreciation") may result from a lower level of educational achievement if it allows students to have more time for non-academic activities such as football games or parties. The market is more catholic than university faculty about what comprises a "good school". One clear indication of this is the advice given to high school seniors: it is more important to find a school that provides a good fit than one that is more prestigious. Moreover, the market seems to value employment and career path outcomes more than pure academic excellence as reflected in, say, faculty publications or number of Nobel laureates on the faculty.

While Figure 2 illustrates the education-effort tradeoff for three educational technologies, we could assume that H varieties exist.

MARKET EQUILIBRIUM

Both students of a given type and universities of a given type are better off as they move northwest. What constrains their outcomes, as measured by utility and reputation? Universities are not subject to a zero-profit constraint, but they are subject to the resources made available by government, private donations, and revenue from tuition and sales of other products. This determines the limit on their reputations. However, reputation is a positional good: given the resources available in the economy, one university will be "the best", and all other universities will strive to get closer to that reputation by acquiring more resources and attracting the best students. If the best university gets better by acquiring more resources, then all other universities will attempt to follow. However, the universities, and their funding, set the constraint on achievable levels of reputation and utility.

Students will choose those universities that provide them with the most efficient education-effort tradeoff, given their

preferences: at the tangencies where their MRSs equal the marginal benefits from effort at the various universities. A student may be in disequilibrium in two ways: consider Figure 3. She may be matched well at the university but failing to realize all the educational benefit that is worth her effort (point M): if she exerts more effort, the educational reward will more than compensate her. Alternatively, she may be at the wrong university: the educational increment is smaller than she requires to exert the added effort (point N). However, if she were at a university more suited to her preferences, she would be better off (point N'), which requires the same level of F and is also on $ICo(x)$.

How can we characterize the market equilibrium? Given the universities society is willing to support, students attend those universities that provide the educational reward for effort that matches their preferences. One can see the locus of tangencies defining equilibrium matching in Figure 3. However, the locus can take several forms depending upon the density of students and schools of various types. Consider the following three general patterns. A linear locus would reflect a constant relationship of educational reward to effort across student and university types. A locus with an increasing slope would indicate that students more willing to defer current gratification for a given effort level attend universities that are converting effort into a greater educational return. A locus with a decreasing slope indicates the opposite: students more willing to defer current gratification are attending schools where their effort yields a smaller current educational return.

Regardless of the shape of the locus, we expect that the general pattern is a positive relationship between amount of education and amount of effort. This need not be true, however. Since the requirement for reaching a higher iso-reputation curve is greater funding, the distribution of funding could generate a locus that is essentially horizontal. However, it could not be negatively sloped—a result

requiring that the more efficient universities receive less funds and that they could attract students. This is unlikely because, in the absence of adequate funding for more efficient schools, students with, for example, a lower MRTTP would all tend to cluster (on a lower indifference curve) at relatively inefficient schools.

Whether one or more universities with a given technology exists depends upon both the availability of adequate resources and the density of students of a given type at any tangency. Without adequate enrollment, some types of universities will not exist, and students will attend universities that are either more or less efficient than the “missing” university. At the former, they will provide more F and earn greater E; at the latter, they will provide less F and earn less E.

The locus of tangencies describes the array of universities that would exist in the market equilibrium. There will be some lowest quality/lowest effort university closest to the origin and some high quality/high effort university to the northeast. The nature of this equilibrium is broadly consistent with the hierarchical structure of higher education. Moreover, the different technologies may be considered to be broadly analogous to the different bands of schools that perceive each other as competitors. While the equilibrium (F,E) pairs will reflect this quality differential, we cannot say anything about any differences to the return to effort at the margin among the universities. All we can expect reasonably is that the slope will tend to be positive at every effort level.

Note also that the overall rate at which student input is rewarded with an increment to education depends upon the resources available for different university technologies. More resources for more efficient technologies means that the positive connection between student input and education is greater (greater slope).

REGULATION OF UNIVERSITIES

The equilibrium just described permits students and schools of all quality levels. The only

requirement for survival of a given student-university pair is adequate density of students and adequate resources for one or more universities of a given type.

However, while the higher education market in the United States experiences relatively little government regulation, it does regulate itself in various ways. For example, it uses accreditation widely. In the context of the model, this means that, while any institution can exist, some institutions attempt to establish that those providing less than some level of E (say, E_{min}) are inferior or not worthy of accreditation. In this model, this failure would reflect a lack of funding; but, more generally, it may be that some technologies are simply incapable of reaching E_{min} (e.g., schools where no faculty member has a college degree). Of course, the organization dispensing accreditation is operated by the institutions so that they can set E_{min} wherever they want. While this does not mean that any given school can manipulate the process to ensure its own successful accreditation, it does mean that accreditation is unlikely to require so much input that “too many” schools cannot achieve it. This again reflects the positional nature of our judgment of school quality.

Also, notwithstanding the lack of imposed regulation, university faculty tend to self-regulate through various faculty norms such as possession of a terminal degree and reward for producing publishable scholarship. These norms implicitly establish minimum standards for the quantity of education reflected in a university degree; and, within a particular range of university reputation, the norms are more specific such as quantity and quality of publication.

A NOTE ON TESTING THE MODEL

We have already suggested that the model given above captures several of the stylized facts of this market—a matching of student types with school types, the possible existence of multiple equilibria, the related observation of different clusters or bands of schools that informally

define a submarket, the hierarchical structure of the industry, the positive correlation between student contribution and quantity of education, the distinction of types of students at a given effort level by the reward required to induce them to provide more effort units, the distinction of types of universities at a given effort level (by students) by the return to effort units they can yield. The model has at least casual empirical support.

A more intentional test of the model would need to test the correlation between educational value added and units of effort at various types of schools. The challenge here is finding a more interesting measure of E than income and a more comprehensive measure of F than standardized test scores and grades. Collecting data on time spent on school work seems feasible as does collection of data on time spent on non-student activities such as market employment (except at some university-related jobs) and at one’s family home. The relevance of the latter two measures is that it may allow one to come closer to finding time spent learning from the relatively nonacademic opportunities provided by the university (e.g., concerts, outside speakers, dinnertime conversation) net of simple external employment or living with one’s family.

SOME ADDITIONAL CONSIDERATIONS AND COMPLICATIONS

An earlier section discussed some of the characteristics of this market that distinguish it from a model for commercial private goods. It is worth noting some additional peculiarities at this point.

The model does not discuss prices. It suggests that, given freedom to migrate and a “complete” distribution of universities and technologies yielding an upward sloping envelope of available universities, students will sort themselves to yield the positive student quality-university quality relationship. Students with a higher MRTIP, for example, will be worse off at more efficient schools.

It is not surprising that prices do not play a prominent role here. Unlike a traditional market, we do not tend to rely upon price-based rationing in this market. The rationing is more merit-based, albeit in the presence of considerable imperfect information. Indeed, it is difficult to know how prices are set in this market, given the large subsidies paid to the vast majority of customers in the market. Prices bear little resemblance to the production cost of the good being purchased; and, in light of the goal of generating excess demand, they are certainly not market-clearing. The basis for pricing in this market may be anything from maintaining tuition as a consistent share of average cost to starting with prices at some administered level historically and raising them annually at the same rate as the rate of increase in the school's operating budget.

One of the greatest complications of the transaction we describe here is the asymmetric information between buyer and seller. The seller is trying to attract the best quality student but has a difficult time identifying those and collects extensive information, only a small part of which allows individual comparisons (esp. standardized test scores). Given the buyer's ultimate interest in the quality of the institution, she knows remarkably little, other than general school reputation, about the transformation she is about to undertake and the manner in which it will be affected by the community she enters. The best schools attract enough applicants from the right tail of the ability/accomplishment distribution to be assured of high quality; the lowest quality schools do not have that benefit for the left tail because it extends to include all the college-age individuals who are not even interested in attending. They may have a more difficult time ensuring the minimum quality they require. Thus, we might expect the quality of the academic matches at any but the best schools to be noisier.

We have also assumed that an accurate signal from, say, the labor market allows customers to gauge both the E-value and the E-

F tradeoff at various schools. This is probably true only in the broadest sense and is subject to various disturbances such as business cycles and structural shifts in the occupational needs of the economy. At best the customer can gauge the quality of skills achieved; it is more difficult to assess the job and career opportunities that will develop.

It is also worth mentioning that the outcome of the process may be a signal rather than employment value added: the efficiency of various technologies may reflect their ability to discriminate among various students and to yield accurate signals to the labor market. More efficient technologies yield more reliable signals than less efficient ones.

Recall that regulated quality standards (e.g., accreditation) are set by the industry and are more reliable as a guide to relative quality than to the absolute quantity of value added to the student.

Finally, one must acknowledge that the market we are considering is increasingly a global market and the matching may become increasingly global in coming years. A current illustration of some issues raised by the significant expansion of a higher education market is the anticipated integration into a European higher education area of the existing EU countries, and their universities, and the accession of ten new countries into the EU, most of which are from Central and Eastern Europe (CEE) and therefore coming from the tradition of Communist higher education. Some of the issues arising from such a market expansion have been discussed elsewhere (Marks, 2003) and warrant some mention here in the context of this model. A possibly surprising issue is the relevance to efficient matching of the language of instruction. Since, in most cases, the language of instruction is simply part of the education production function, recognition of how few students and faculty in a market as wide as Europe or the world will have market-wide mobility because of language barriers suggests a significant barrier to efficient matching of students and schools.

A second issue in this market is the very different intellectual traditions of Western Europe and Central and Eastern Europe emerging from the Communist era. This clash of traditions means that many CEE universities are ill-equipped to compete with most EU universities. Unless CEE students have the language skills and the ambition, they may be relegated for some time to unnecessarily low-quality education.

CONCLUSION

It is easier to understand the lack of a well-established model of the market for higher education when one considers all the industry's peculiarities. It is fair to consider the allocation of higher education as market-related, but it is not simply a market. It may also be fair to say that the demand side (students) is more market-oriented than the supply side. Much of the allocation is non-market and more closely related to first-come-first-served and authority-based. Except for those activities that simply mirror traditional market activities (e.g., the bookstore)—which are often subcontracted these days—prices are difficult to understand. The use of customer-as-input technology provides part of the explanation since customers pay only a net price—output price less an implied wage for contributing to the education of one's fellow students. The significant role for donative resources and government contributions further complicates the analysis of price.

This paper has proposed a matching model—perhaps closer to a model of (successful) marriage than to a model of buyers and sellers—which captures many of the stylized facts of the market. One can anticipate some of the data requirements for testing, and they would be significant.

Another direction to take the analysis considers policy implications. With its emphasis upon matching, it suggests targets for policies that might improve the quality of matches such as more standardized information

about both buyers and sellers and, more controversially, the value of establishing a common language for instruction and research.

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