

Economics, Productivity, and Presidential Leadership in Higher Education

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Under the 25 years of James Doti's presidency (1991-2016), Chapman University experienced a tremendous rise in university rankings. In 1991, Chapman ranked 61st on the US News & World Report Best Western Regional University rankings; in 2015, it tied for 7th. The fact that both he and his wife, Lynne Pierson Doti, hold a Ph.D. in Economics may be more than coincidental with this rise. Organizations that ignore economic principles generally do so at their own peril. President Doti spoke at Freedom Fest 2015 in Las Vegas about some of the ways that Chapman University has applied economic ideas, such as comparative advantage, economies of scale, and harnessing incentives under his leadership (Doti, 2015). His message was clear —universities will deliver higher quality output at a lower price when they employ economic theory as compared to when they ignore it.

While there are many directions in which one can go with respect to writing about the application of economic ideas to higher education, the primary focus of this paper will be on college productivity. There is arguably no more important an economic measure than the amount of output produced per unit of input. Since the Industrial Revolution, most industries have seen tremendous advances in productivity and as a result, global standards of living have risen 34-fold over the past 215 years, after basically doubling over the previous million years (DeLong, 2014). In short, advances in the quantity and quality of capital (both human and physical) mean that the world's scarce inputs are able to make far more output than they could have two centuries ago. With respect to higher education, it is true that today some professors use PowerPoint and smartboards — tools that Socrates did not have at his disposal when he was teaching the youth of Athens. However, when one thinks about the total cost of inputs divided by the value of outputs, it is clear that productivity advances in

higher education have lagged well behind almost every other industry over the past two hundred years.

University Presidents and the Field of Economics

The pressures of being a modern day university president are extraordinary, which is why the average tenure of a university president is only 7 years according to a 2012 report by the American Council on Education (Lederman, 2012). In this respect, James Doti's 25-year tenure at Chapman University is quite remarkable. But Doti has an attribute that may have contributed to his presidential longevity — he is a professional economist who studied with some of the very best economists of the 20th century at the University of Chicago, including Milton Friedman, who many consider to be the premier American economist of that century.

As it turns out, economics is an extremely popular subject of study for university presidents. To illustrate, five of the schools currently ranked in the top eight by Forbes Best College list had had an economist serve as president at some point since the year 2000: Morton O. Schapiro (Williams College from 2000 to 2009), Lawrence H. Summers (Harvard University from 2001 to 2006), Richard C. Levin (Yale University from 1993 to 2013), Harold T. Shapiro (Princeton University from 1988 to 2001), and Christina Paxson (Brown University from 2012 until the present). Furthermore, 92 individuals who served as presidents of the 25 top schools (again using the 2015 Forbes Best College list) during the 25-year tenure of President Doti were examined. Nine of those individuals, or nearly 10%, had a Ph.D. in Economics. Also examined were the current presidents at the top 75 schools on the Forbes list. Today, 7 of these 75 schools — 9.3% — are headed by a president with a Ph.D. in Economics — Christina Paxson (Brown University), Lisa M. Lynch (Brandeis University), Rebecca Blank (University of Wisconsin-Madison), Raynard S. Kington (Grinnell College), Jill Tiefenthaler (Colorado College), Catharine B. Hill (Vassar College), and Morton O. Schapiro (Northwestern University). It is noteworthy that despite the fact that around 9% to 10% of university presidents are economists, only around 2% of all doctorates awarded in American universities over the last 50 years were in economics. Thus, a person with a Ph.D. in Economics has around *five times* better a chance of becoming a major university president than one trained in other disciplines.

As the length of Jim Doti's tenure at Chapman is exceptional, we wondered whether university presidents with Ph.D.s in Economics tend to have longer tenures in their positions. We calculated the average tenure of all presidents who served a full term (i.e., we excluded all presidents whose terms were still in progress) between 1990 and the present at Forbes' top 75 schools. We found that the average tenure of a president with a Ph.D. in Economics was 10.7 years while the average tenure of a president without a Ph.D. in Economics was 9 years. This suggests that economists stay around 19% longer in the position of university president than otherwise. Of course, a short tenure could be the result of leaving for a better offer rather than leaving because of a worn-out welcome, so we must be cautious about reading too much into the results.

Finally, we were interested in whether university presidents with a Ph.D. in Economics were more effective at moving their schools up in the rankings during their tenure, as Dr. Doti was able to accomplish at Chapman. To analyze this, we took the

difference between a school's rank in the year that the president began his or her tenure and the rank in the year that the president left (or the current rank if the presidency was ongoing). We had a total of 241 observations of president tenures at top 75 schools since 1991. We found that presidents with a Ph.D. in Economics saw their schools move up in the rankings by an average of 0.75 slots during their tenure. Presidents that did not have a Ph.D. in Economics saw their schools fall in the rankings by 0.39 slots during their tenure. Thus, a president with a doctoral degree in economics would be able to move his or her school up in the rankings by around 1.14 slots compared to other presidents. This is true despite that fact that, as mentioned earlier, economists are overly represented at highly ranked schools and it is more difficult to move up in the rankings from say 5 to 3, than it is to move from 65 to 63.

By all accounts our analysis suggests that university presidents with doctorates in economics are both more highly valued and more successful than their counterparts with a Ph.D. in other fields. Why is that? We would submit it is because most of the critical challenges facing college presidents are economic in character. The single most important feature of modern day higher education in the United States has been the sharp increase in prices — tuition and fees. Economists understand the reasons for price changes and the implications of the scarcity of resources, including the important concepts of opportunity costs and comparative advantage. When a college expands, say, graduate programs in business administration, it likely foregoes opportunities to expand other potentially worthwhile programs — these are opportunity costs. If a school develops strength in a certain discipline and gains a national reputation, it often acquires a comparative advantage in emphasizing that field of study. Generally, nations, businesses and universities promote programs utilizing their comparative advantage. Economists teach these concepts, and successful university presidents can use their mastery of these subjects to their advantage.

Productivity in Higher Education

Economics-trained university presidents are likely to have a strong appreciation for a major reason that college costs have risen dramatically over time — collegiate productivity has stagnated, particularly relative to other areas of human endeavor, such as growing wheat, building cars, operating airlines, or offering information technology services. Over the very long run (since 1870), labor productivity in the United States has risen close to 2% per year. On average, workers make about 2% more goods (or services) per hour of effort than they did a year earlier. This is the basis of our rising standard of living. Wages are closely tied to productivity, so if worker productivity rises by 2% annually (adjusting for inflation), so should wages. Even in areas with little or no productivity advance, wages need to rise by something close to the average for the whole economy or workers will switch to employment in the higher-wage fields and not seek employment in the fields with no wage growth.

In contrast to other industries, productivity in higher education has not risen during the last several decades. As we will demonstrate below, it takes just as many labor inputs to produce a given amount of higher education services today as it did in the early 1970s, at the beginning of the academic careers of Jim and Lynne Doti. And since wages have risen, labor costs have risen sharply in universities even though

productivity has stagnated. Since labor is the dominant input used in producing higher education services, this has forced costs upward, resulting in higher tuition fees and compelling increased efforts by university presidents to secure funds from other sources as well (government appropriations, research grants, and, especially for private institutions like Chapman University, philanthropic contributions with its related endowment income).

To be sure, measuring higher education productivity is very difficult. The “output” of higher education is in large part the value added to students from attending the institution: greater knowledge, better critical reasoning, leadership and communication skills, maybe a better sense of right and wrong, and so forth. But these things are often not measured very well, if at all. We do not even have accurate data on earnings of graduates by schools (although efforts are underway to rectify this), in order to assess the vocational investment returns of specific universities.

But that is only part of the problem. Universities produce many types of outputs. For example, they produce research that creates additions to the stock of knowledge. However, they are also usually in the food and lodging business, not to mention running parking lots and occasionally conference centers. Some of them run big commercial operations, including medical centers that sometimes derive as much income as the rest of the university. And, of course, they are in the entertainment business — hosting sporting events, plays and concerts, and in many cases, running art galleries and museums. Some of these activities are not sold in competitive markets, and thus we do not have objective metrics of their market value as is generally determined by demand and supply considerations.

For example, how does one assess the value of the contribution of an article published in an obscure academic journal which is cited by perhaps one other scholar, read by perhaps 25 persons, and which has next to no impact on the very specialized scholarly area in which the professor is writing? Emory English professor Mark Bauerlein once pointed out that scholarly output on William Shakespeare approaches 1,000 articles a year — or 4 for every business day (1 every 6 hours) (Bauerlein, 2009). It seems inconceivable to us that, at the margin, the majority of those new articles, even if read, will add much valuable insight into the contributions of the Bard, but how do we really know? Any attempt to assess the overall productivity of the staff at a modern university is fraught with peril and potentially serious error.

But that will not stop us. After all, we have tenure, and the consequences of making mistakes in higher education are generally extremely small (the lack of a strong incentive/disincentive system is one of the many causes of slow change and innovation in universities, something economics-trained college presidents acutely understand). We start with an assertion — at most, but by no means all universities and colleges, the overwhelmingly most important mission is related to instruction. Let us say that as a generalization, two-thirds of the “output” of schools is typically related to instruction. That is not true at Cal Tech or Johns Hopkins where research plays a much more important role, but there are far more institutions with modest sized graduate and research programs, and where the focus is on educating students.

One of us argued in a book published a dozen years ago (Vedder, 2004) that university productivity had likely fallen, and certainly not risen, since 1976. Does that

conclusion hold after the passage of more time? We turned to data from the Delta Cost Project, based mostly on the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS), and looked at the period 1988 to 2012, which comes close to approximating Jim Doti's tenure as President at Chapman University. Counting part-time workers as one-half of an equivalent full-time employee, we learned that while in 1988 it took 22.21 employees to service 100 full time equivalent students, in 2012 it took actually 3% more at 22.82.

Moreover, this analysis probably understates the increase, as the data show a large decline in university maintenance and service personnel. This decline is almost certainly fictitious as it is largely driven by the movement during the last 25 years of universities to contract out maintenance and food service operations to other providers. Thus, these workers will not show up in the university employee statistics. Adjusting for that, workers per student in higher education almost certainly rose somewhere between 5% and 10%. Using this as a broad measure of productivity — workers per student instructed — productivity in higher education has fallen.

Meanwhile, in the entire business sector over the same time frame, labor productivity rose 68.2% between 1988 and 2012 (Whitehouse.gov, 2015). Take a task that it took 22 workers to do in 1988 in higher education (for example, educate 100 students), and a task requiring the same number of workers in a private business. In 2012, it took 23 workers to do the same tasks in higher education, but typically only 13 workers in business. Thus, assuming no change in the relative compensation of employees in academia and non-academia, in 2012 the labor costs per unit of output in higher education had risen roughly 77% relative to that in the business sector.

The 77% rise in relative labor costs in higher education between 1988 and 2012 suggests an increase of nearly 2.4% a year — adjusting for inflation. We do not think that it is at all coincidental that this increase basically mirrors the rise in inflation-adjusted tuition fees in this period — after all most higher education costs are labor-related. It leads us to tentatively conclude that *the tuition price explosion in higher education is largely the result of rising labor costs per unit resulting from a lack of productivity growth.*

Other Consideration in Measuring Output in Higher Education

To be sure, some caveats are in order with respect to the conclusion above. First, it is possible there have been qualitative improvements — today's students may be better educated than a generation ago. This is possible, but if anything, the data shows there may have been learning decline. Data from both the U.S. Department of Labor and the Higher Education Research Institute at UCLA suggest that today's average student spends far less time on academics than counterparts of a half century ago — and improvements in learning do not seem likely without studying or going to class (Babcock & Marks, 2010). The Adult Literacy Survey data from the U.S. Department of Education (Kutner et al., 2006) shows some decline in literacy amongst college graduates over a large part of this period. Arum and Josipa (2010) show that contemporary students show very little gain in critical thinking and writing skills over the college years.

It is also possible that there has been a surge in productivity outside of the instructional area of higher education. Suppose teaching is two-thirds of what higher education is all about, and research and other things comprise the remaining third. As

active researchers, we can attest that advances in word processing and communications have meant that research can generally be carried out more efficiently today than in 1988 before the widespread use of email, personal computers, or the internet. Papers that were formerly typed and mailed in triplicate to journals for consideration can now be sent instantaneously via electronic submissions. Word processing means that revisions can be made much more easily than in the days of manual typewriters. Journals that formerly took nine months to get back to authors with a decision on a manuscript, now generally get back in three or four months.

Of course the question still remains about the economic value of this research. We completely agree that universities, especially at the “Research-1” level, are producing impactful work that at minimum adds to humanity’s basic knowledge set, and in some cases may even lead to scientific breakthroughs that can extend or improve the quality of life. According to the Bureau of Labor Statistics there were 1.31 million college professors in 2014 (U.S. Department of Labor, n.d.). Suppose, on average, each completes 1.5 scholarly endeavors (books, journal articles, artistic pieces, musical compositions, etc.) per year. This suggests that universities produce around two million units of scholarly output each year. But what portion of these actually have “value” in the economist’s sense (economists define value based on the willingness of society to pay for a good). In truth, in the last several years, academia has seen a scandalous rise in “pay to publish” journals whereby authors pay hundreds of dollars to an online journal to nominally peer review and then publish their work, often within two to four weeks of submission. Jeffrey Beall, a librarian and associate professor at the University of Colorado at Denver has compiled a long list of such “predatory” journals (Butler, 2013). To apply this to another sector, it would be like the farmer paying customers to eat his corn or coffee shops paying customers to drink Americanos. Some professors engage in this activity because their employment may depend on producing scholarly output, often so that the college can remain accredited by external agencies.

Still, despite our misgivings about its accuracy, let us suppose productivity is rising at the national norm of 2% per year in the non-instructional aspects of higher education. Given a 2% rise in that one-third share, and a small decline in the remaining two-thirds share, total labor productivity in higher education would be rising by around 0.6% a year. This we believe is an upper bound.

Are College Amenities Part of the Productivity Problem?

One of us (Taylor) has, for the last two years, taught a freshman honors seminar dealing with the way universities operate and why the cost of tuition has been rising so dramatically. Of all the items discussed in this class, perhaps the most surprising figure students encounter is just how much of a university’s resources (in both dollars and in staff) go toward non-instruction. Interestingly, the students generally reached a consensus (though some disagreed) that college today is as much (or more) a consumption good as it is an investment good. Louisiana State University was criticized roundly for raising student fees by \$150 per semester to build an \$85 million “lazy river” in the shape of the letters “LSU,” but the students in 2011 voted overwhelmingly in support of this project — 84% voted yes. The students at LSU

valued the lazy river more than the additional fees that they knew they would have to pay. News accounts report increasing levels of elaborate amenities such as these at many schools. Highpoint University, for example, apparently offers students valet parking. It is well known that college is generally much cheaper in Europe than it is in the United States, but European colleges are much more focused on instruction rather than experience and this almost certainly contributes to the cost differences.

Community colleges in the United States are much more like European colleges in that they offer far fewer amenities (climbing walls, pop concerts, modern workout centers, posh housing, food courts, museums, etc.). And, of course, they are far less expensive than four-year universities. Today, approximately 7 million students attend community colleges while 13.2 million attend four-year colleges and universities (National Center for Education Statistics, n.d.). The fact that so many students forgo community colleges and jump right to four-year schools suggests what economists call a “revealed preference” for the amenities and lifestyle that a university can offer despite its higher cost. That does not mean that universities necessarily are offering the optimal amount of amenities. Indeed, it has often been suggested that universities are engaged in an “arms race” scenario with respect to amenities. Game theorists would say that universities face a “prisoner’s dilemma” scenario whereby the collective best action is for each university to spend less on amenities, but it is individually optimal for each to spend more. Less spending by one school when all others are increasing amenities means that one school will be at a strong disadvantage when it comes to enrollment numbers as well as student quality.

What can we say about productivity with respect to offering amenities? University libraries are typically one of the largest buildings on campus. According to the Department of Education (2015) the average number of volumes per full-time equivalent (FTE) student in degree-granting post-secondary school libraries was 69 in 2011-2012 (National Center for Education Statistics, n.d.). Given massive changes in technology over the last two decades, libraries are valued far less by students, and faculty, as a source of information than they previously were. Students look up information online and faculty often access journal articles online rather than walking to the library to review physical copies. Courant and Nielsen (2010) estimate that it costs \$4.26 per year to hold and preserve a physical copy of a book in the common “open stack” library format, but that companies like HathiTrust and Internet Archive can provide a fully mirrored digital archive with full backup for \$0.15 per book, per year. Employing the average of 69 volumes per student number from above, this suggests that universities can save up to \$284 dollars per student [$(\$4.26 - \$0.15) * 69$] per year by converting to digital holdings. Public university libraries within the same state system can also save by engaging in collaborative storage networks, consortium purchasing, and license sharing. In the private sector, where costs are constrained by market discipline, these are the kinds of moves that have been made so as to achieve the 68% jump in productivity between 1988 and 2012. The Department of Education data show that between 1991-92 and 2011-2012 academic years, the number of books in university libraries did fall, but only by 4% (from 72 to 69 volumes per FTE student). This is just one case where universities are under-embracing new modes of operation that could result in higher productivity.

New Layers of Administration: Part of the Problem?

Universities need academic support staff in order to disseminate knowledge. Registrars are needed to record the accomplishments of students, bursars are needed to collect tuition payments, deans of students are needed to deal with disciplinary and other issues relating to student behavior, and development officers raise money from private sources. Yet these and other support activities, however useful, do little or nothing to directly impart knowledge to students or lead to the discovery of new truths. One could argue that a good institution is one which minimizes the costs of what we can loosely call “administrators,” thus allowing more resources to directly meet the core functions that define a university — teaching and research.

In the 1929-30 academic year, 8.4% of university spending was for “administration and general expenses,” a proportion that had risen to 14.6% by the closing years of the 20th century. Meanwhile, spending on “instruction” fell from about 44% in 1929-30 to slightly over 30% in 1995-96 (Vedder, 2004, p. 44). The trends have continued in this century. Looking at public institutions, in 2000-2001, 30.42% of expenditures went for instruction. However, by 2013-14 this had fallen to only 26.46%. Tuition fees ostensibly cover the cost of instruction, but “instruction” is increasingly becoming an almost minor portion of university spending.

The creeping bureaucratization and the increasing de-emphasis on instruction appear to be significant factors in the productivity stagnation besetting the modern university, and thus a meaningful contributor to rising costs. Adding to the problem has been some escalation in compensation to administrative staff. Salaries of university presidents, for example, have risen noticeably in recent years, the exact extent of which is difficult to measure in part due to increasingly complex contract provisions (elaborate fringe benefits such as club memberships and use of private aircraft, deferred compensation payments, and the like). Annual payments of tens of million dollars to managers of large university endowments — unheard of decades ago — are common at highly endowed schools. And, of course, the salaries of coaches have exploded at many colleges and universities. University of Alabama football coach Nick Saban is the highest paid government employee in the country with a salary of \$7 million (Braverman, 2016).

As previously indicated, university presidents trained in economics should be especially aware of the opportunity costs of bigger and costlier administration. Money spent on administrators could be spent on instruction — or devoted to tuition reduction. An interesting question left open for future study is whether university presidents who hold a Ph.D. in Economics preside over universities that allocate resources differently than otherwise?

Conclusion

The cost of college tuition has risen at a rate that is far higher than almost any other sector in the economy, including health care, over the last two generations. We contend that the major reason for the increase in the cost of college relative to other sectors is the lack of growth in productivity in higher education. In 1988, it took around 22 full time workers at a university to educate 100 students. Today it takes around 23 workers

to achieve the same outcome as productivity has fallen in higher education. In other parts of the economy, where productivity rose over 68% between 1988 and 2012, a task that 22 workers could accomplish in 1988 can today be accomplished with around 13 workers. Despite the stagnation in productivity, faculty and staff compensation has risen at a similar rate to other parts of the economy since wages are largely a function of alternative employment opportunities. This is, we believe, the primary reason that the cost of higher education has risen dramatically relative to other sectors of the economy.

University presidents would, under any circumstances, face enormous challenges in leading a group of employees with highly disparate interests and objectives. But the lack of productivity growth compounds these challenges dramatically. Yet some, like Jim Doti, have risen to this challenge and seen their schools rise in the rankings. We believe that the training of Dr. Doti, as well as that of his spouse, Dr. Lynne Pierson Doti as economists may have something to do with his success. Our analysis of 242 university presidents who have served a stint at a school in the current top 75 found that universities who had a president holding a Ph.D. in Economics moved up in the rankings by an average of 0.75 slots during the president's tenure and that schools with non-economists serving as president fell 0.39 slots. University presidents with a doctorate in economics also had a 19% longer tenure in office than those without one. It is no wonder, then, that over the last 25 years, nearly 10% of all university presidents at top schools had a Ph.D. in Economics, even though only around 2% of all doctorates have been awarded in this field over the last 50 years. Economists are trained to deeply understand scarcity, incentives, and the consequences of productivity growth — or a lack thereof. These are skills that a university president almost certainly values at a premium. Being an economist who trained at the University of Chicago when its faculty included towering figures in the field such as Milton Friedman, George Stigler, Robert Mundell, and Gary Becker — all Nobel laureates — Jim Doti understood the hand he was dealt in 1991 when he assumed the Chapman presidency. And he used his knowledge to position Chapman to operate successfully in an environment where success is difficult to measure and even more difficult to achieve.

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