For-Profit Pathways into STEM

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There are frequent calls for more students to graduate with STEM credentials. The Obama administration, for example, has argued for one million more STEM graduates over the next decade in order to meet the projected need for STEM-related jobs. Others have framed this as a goal of doubling the number of U.S. students who graduate in STEM fields (e.g., Business-Higher Education Forum, 2010). Since current data from the National Center for Education Statistics show that about 900,000 students graduated from nonprofit and public postsecondary institutions in STEM related fields at all levels[1] in 2012, this is a major commitment to be realized by the nation's colleges and universities.

I was asked to discuss the potential role that the for-profit higher education sector may have creating the required number of new graduates in STEM fields. The for-profit sector has grown rapidly in recent years[2]. Since the beginning of the 2000s, 40 percent of enrollment growth has been concentrated in the for-profit sector along with a third of all new credentials awarded during this period. The sector currently enrolls about 12 percent of all students in higher education. It clearly is a significant contributor to the overall capacity for postsecondary education in the United States. But how does it currently impact STEM education? And does it have the potential to greatly expand its offerings to make a substantial contribution to the number of STEM graduates over the next five to ten years? Arguably, the for-profit sector should be well-positioned to meet the market demand for

[1] This counts undergraduate degrees and certificates from Title IV institutions in the following broad fields of study as defined by the IPEDS surveys conducted annually by NCES: Health Professions & Related Programs; Computer & Information Sciences & Support Services; Engineering Technologies & Engineering-related Fields; Engineering; Biological & Biomedical Sciences; Science Technologies/Technicians; Physical Sciences; and Mathematics & Statistics.

[2] Unless otherwise noted, data in this paper comes from NCES data, and is based on author's calculations

more STEM graduates. After all, the for-profit sector is made up of what are known as Career Colleges: places that are fixated on the idea of providing students with an education directly related to getting a job (Deming, Goldin, and Katz, 2012). If the STEM market needs more graduates, the for-profit sector ought to be able to quickly ramp up to serve that market. On the other hand, the for-profit sector is committed to serving student demand as well (Kinser, 2009). If few students are interested in STEM credentials, the for-profit sector will not find sufficient revenue to mount the programs required.

This paper will first review the history of the for-profit sector and its current scope. Next I will identify the fields of study the for-profit sector currently concentrates on, with a specific focus on STEM disciplines. The comparison will be made to nonprofit and public higher education to demonstrate the relevant difference between the sectors. I will discuss the regulatory challenges faced by for-profit higher education, particularly as a result of its relatively high prices and reliance on federal financial aid. Accreditation issues and transfer between sectors in STEM fields will also be addressed. I will next provide case studies of two different types of for-profit institutions, to emphasize the diversity of the for-profit sector, in addition to its distinctiveness within the higher education universe. Finally, I will conclude with a few observations about the role of the for-profit sector as part of the policy equation in meeting the demand for STEM graduates in the future.

History and scope

Despite the attention to the relatively recent expansion of for-profit higher education, educational institutions have operated as profit-making businesses since the early 1800s (Kinser, 2006). Originally labeled as Commercial Colleges, these entities began training students in new roles as clerks and accountants in the emerging technologies of

private sector commerce. By the middle of the 19th century, commercial colleges had grown in importance, with branches in nearly every major city around the country. In the 1860s, Bryant and Stratton College, an institution that still exists today, had dozens of branches and sponsored an annual meeting attended by prominent politicians, business leaders and educators. The for-profit college was the key path by which a young man [they were always men during this period] without family connections could gain a foothold in the world of business. From there, personal grit and gumption could let the ambitious rise high. Many corporate giants were graduates of these schools, including John D. Rockefeller and B.F. Goodrich. Compared to the traditional colleges of the era, the education the business colleges provided was eminently useful. Andrew Carnegie was certainly not referring to the for-profit business college when he said "college education as it exists seems almost fatal to success." In fact, he was a regular speaker to students enrolled in for-profit schools, and extolled the practical benefits of the education they provided.

In 1870, the U.S. Bureau of Education began collecting data on all levels of education in the United States, and "private business schools" were included in the institutional mix from the beginning. In words not too different from what might be written now, an 1873 report from the Bureau stated

> The rapid growth of the schools and the large number of pupils seeking the special training afforded by them sufficiently attest that they meet a want which is supplied by no other schools in an equal degree. …Hence, it would seem that there could be no question of their utility and importance nor of their title to recognition and encouragement." (quoted in Knepper, 1941, p.

68)

From the estimated 20 colleges in operation in 1850, there were at least 250 in 1890, with over 81,000 students. (Knepper, 1941, p. 92). By comparison, in 1890 there were about 1000 traditional colleges and universities in the U.S., enrolling just 157,000 students (Snyder, 1993). Without a doubt, the for-profit college was the most significant institutional presence in business education in the second half of the 19th century.

At the end of the 19th century, however, the dominant role of the for-profit business college was challenged by public secondary schools from below, and by universities from above. New collegiate business schools were founded rapidly at the turn of the century—from three in 1898, to more than 50 by 1920—and a college degree became the most common credential among business executives from that point on (Khurana, 2007). Enrollment peaked at the for-profit business college in 1920, as progressive notions of public support for education took hold and effectively relegated the for-profit model to the margins of American higher education (Miller & Hamilton, 1964). It remained marginal, except for a brief period after World War II when the benefits offered by the GI Bill were sought after by many new profit-seeking educational institutions. The evident abuses during the immediate post-war time led to federal legislation tying formal quality assurance procedures to access for financial aid (Mettler, 2014), and among other things, led to the accreditation system in place in the United States today (Kinser, 2005).

Beginning in the 1970s and 1980s, a combination of regulatory reforms and accreditation changes, led many for-profit institutions to develop undergraduate degree programs, in addition to their longstanding focus on non-degree certificates. Some even

began awarding graduate degrees, including doctorates. The national branch models, last seen in the 1800s, re-emerged. Institutions like the University of Phoenix, DeVry University, and ITT Technical Institutes developed extensive national footprints, while others like Strayer University and Bryant and Stratton College expanded regionally. A new funding model emerged too, with Wall-Street backed publicly-traded corporate universities becoming the largest players in the for-profit education market, and venture capital investments driving the expansion (Kinser, 2007). All of this combined with the Internet boom of the late 1990s to result in a sea-change for the sector. Online learning exploded, and institutions began growing at double-digit rates. Suddenly, it seemed, for-profit higher education looked like an unstoppable juggernaut.

No longer marginal, for-profit higher education began exerting its influence in Congress and the US Department of Education to roll back some of the regulations that had been established in the post-war era. Prospective owners took advantage of accreditation rules to purchase nonprofit colleges and convert them to for-profit institutions. New online programs grew from scratch to tens of thousands of students in just a few years. Stock prices were at record levels by 2008, and even the great recession did not push them back down, at least initially. But the Obama administration began looking more closely at the sector. Aided by a Senate investigation that documented numerous issues with for-profit recruiting patterns and use of student loan revenue, some regulations were restored and new ones were proposed. By 2011, it was clear that the high-flying days of the last decade were over (Wiseman, 2011). A more sober for-profit sector emerged—still adamant that it should be part of the solution to the educational challenges of the current era, but adapting its business model to be less reliant on growth at all costs and more connected to the

outcomes of the students it now serves.

I do not want to leave the impression that all of the bad behavior of the sector is in the past. But the industry has made dramatic changes in the way it serves students. It has invested profits back into the schools in order to improve services. Many have reduced tuition or provided tuition discounting, and others have offered no-risk trial periods for students so they can check out the program before committing to a large loan. These are all initiatives that have been done voluntarily. Others have been done in response to federal and state government and regulator focus on consumer information and disclosure, such as identifying the job market and average wages for the graduates of their programs, along with the average debt load. There are many reasons now to be optimistic about the for-profit sector regaining its status as a legitimate contributor to the national educational capacity, even as it is important to verify that the regulatory measures ensure that institutions continue to operate in the student interest.

This background is intended to provide a brief sketch of the sector as it exists today. It is a mix of the old non-degree institutions that train students for a trade or other career in short-term programs, alongside large national corporations that are traded on Wall Street and offer a range of graduate and undergraduate degrees. Some are fully committed to online programs, while others still offer most of their courses in brick and mortar campuses [though often these campuses are in shopping malls and office parks]. It is a diverse sector, with many different types of institutions resting under the for-profit label. But it also a distinctive sector, with a student population, faculty and management practices that are different from the typical nonprofit and public sector institution. The

academic programs are different too, as the next section will make clear. STEM in the for-profit sector has its own unique characteristics.

STEM Programs: A Sector Comparison[3]

The for-profit sector is significantly involved in the STEM fields. An analysis of undergraduate enrollments using the National Postsecondary Student Aid Study, shows that in 2012, 12.7% of for-profit students were enrolled in STEM bachelor programs, and 14.9% were enrolled in STEM associate degree programs. The difficulties the sector has faced with enrollment since 2010—with overall enrollment declines of 13 percent—have likely had an effect. In 2008, the same survey showed more students (17.4%) enrolled in bachelor programs, and slightly fewer (14.1%) enrolled in associate degree programs. These data, however, only focus on enrollments, when the actual completion of a STEM credential is what is important. Therefore evaluating the contribution of the for-profit sector to STEM production means looking at the range of programs offered at these schools, and how they differ from those in the nonprofit and public institutions. Following that analysis, I will look at the cost of attendance in the for-profit sector, and some of the risks associated with the sector's reliance on student loans. Lastly, I will examine the transfer capacity of the for profit sector—does it serve as a significant source or destination for students transferring within STEM fields—and the implications of national and regional accreditation for the for-profit sector.

STEM Disciplines and Student Completions

For-profit institutions offer credentials in many of the same subjects as do the

[3] For tables related to the data presented here, please see my presentation, "For-Profit Pathways into STEM" presented at the Workshop on Barriers and Opportunities in Completing 2- and 4-year Stem Degrees, Irvine, CA, January 22, 2014

nonprofit and public sectors[4]. There are few areas in which the for-profit sector is not represented, though the relative importance of each field of study varies greatly. Ranked by the number of students graduating in each area, each sector has programs in the top five in the broad field of business, as well as in the health professions. The public and nonprofit sectors both have significant offerings in social sciences, however, which is not a top five program for the for-profit sector. After that, the sectors continue to diverge: Public institutions focus more on liberal arts and education; nonprofits on the arts and psychology; and for-profits concentrate more on personal and culinary services, mechanics, and computer and information sciences.

Turning attention to the STEM disciplines, additional differences among the sectors emerge. Although the top STEM field is the same across sectors—Health Professions—it represents a much greater share of STEM production in the for-profit sector that in the public and nonprofit sectors. More than four out of every five credentials are in health in the for-profits, while just over half are in this area for the other sectors. The public and nonprofit institutions have significant production of engineers, biological and physical scientists, and mathematicians and statisticians; the for-profit sector has few graduates in these areas. There is, however, somewhat closer parity in the number of graduates between the public sector and for-profit sector in the fields of engineering technology (60,000 vs 26,000), computer and information science (65,000 vs 38,000), as well as in the health fields (401,000 vs 331,000). In each case, the nonprofit sector awards substantially fewer credentials in these fields than the for-profit sector.

[4] Throughout, I will focus only on undergraduate degrees and non-degree certificates.

Even when the discipline is similar, however, the level of award can vary. The current analysis looks at all undergraduate awards: Bachelor's and Associate degrees, as well as all less-than-two-year undergraduate certificates. Nonprofit institutions award relatively few associate degrees and certificates; about three-quarters of the roughly 175,000 credentials in STEM are bachelor's degrees. Public institutions, on the other hand, are more balanced, awarding roughly 200,000 associate degrees and a similar number of non-degree certificates, and just under 300,000 bachelor degrees. The for-profit sector is on the opposite end of the spectrum from the nonprofits, with around 250,000 non-degree certificates compared to less than 50,000 bachelor degrees, and about 100,000 associate degrees. The contribution to STEM credentials, then, is mostly at the non-degree level for the for-profit sector, with a modest contribution of associate degrees and relatively few bachelor degrees. Even within four-year for-profit institutions, the number of bachelor degrees in STEM fields is fewer than 20 percent of the total. Non-degree certificates at four-year schools represent 30 percent of the total, with the remaining half of the STEM credentials awarded as associate degrees.

Increasing the diversity of students is another aspect of achieving more STEM credentials over the next decade. Here the for-profit sector is quite productive. It awards half of all black and Hispanic credentials in STEM fields, and for-profits are less likely (compared to public and nonprofit institutions) to have Asian or international students graduate from their STEM programs. This reflects the more diverse population of students in general who attend for-profit institutions, as well as the fact that for-profit campuses are more typically located in cities and high population suburbs near to city centers (Chung, 2008; 2012).

Next I will to focus on the differences between for-profit STEM production and that of the public sector in the three fields where they have the closest overlap: Health, Computer Technology, and Engineering Technology[5]. This analysis will look at the specific credentials that are most frequently awarded in each area.

In health fields, the most popular credential by far is a Medical/Clinical Assistant certificate. It accounts for one out of four for-profit credentials—86,000—in the health field. Most of the top areas are certificate programs, including programs in massage therapy, dental assisting, medical biller, licensed practical nurse, pharmacy technician, and medical coding. An associate's degree in medical/clinical assistant, and a bachelor's degree for registered nursing complete the top programs in the for-profit sector. In the public sector, health fields look different. The top two programs are an associate's and a bachelor's degree in nursing—68,000 and 49,000 degrees respectively. The next two are certificates as a licensed practical nurse and as a nursing assistant. Finally the public sector awards two additional certificates, one as a EMT and the other as a medical/clinical assistant. To emphasize how dominant the for-profit sector is in that area, the 86,000 medical assistants trained by the for-profits are contrasted with just 9,000 trained in the public sector. Another contrast is in the number of non-degree certificates in the for-profit sector compared to the public sector. This shows the areas where the for-profits concentrate largely on lower level credentials.

Computer programs present a different picture from health programs. In the for-

[5] There are nearly 300 programs listed in these broad categories, and about 180 are offered just in the for-profit sector. Classification of some programs as STEM may not be appropriate, but this would be difficult to assess without access to program curricula. I therefore use the broad categories as STEM indicators, without making judgments on individual programs.

profit sector, they are all associate's or bachelor's degrees, including three associate's in Computer networking, information technology, and network administration. The bachelor's degrees are in computer security and information technology. The public sector has three bachelor's degrees at the top of the list of computer programs: computer security, computer science, and information science. Publics also award an associate's degree in computer security and another in computer networking, as well as a non-degree certificate in computer networking. The public sector on the one hand awards more bachelors' degrees, but on the other hand includes a significant number of certificates as well. For-profits offer more awards at the degree level, but are more likely to focus on associate's degrees than bachelor's in the computer field.

Finally, in engineering technology the for-profit sector has two associate's degrees (in communications technology and CAD design) and two certificates (in HVAC and automotive engineering) among its top programs in the field. The public sector has an associate's degree in communications technology as its top program in the field as well as one in drafting and design. The sector also has bachelor's degrees in construction engineering and industrial technology, along with certificates in drafting and design, and in communications technology. The variety of top engineering technology programs in the public sector further suggests the diversity of academic attention that is evident among public institutions as compared to for-profits.

STEM Program Cost and Regulatory Impact

The data to make detailed analyses of cost by program are not readily available. But at the institutional level, the out-of-pocket net price of a for-profit institution is $15,000. That compares to $18,100 and $11,800 at private four-year institutions and public four-

year institutions respectively. Community colleges, perhaps most comparable in terms of curricula with the for-profit institutions, have the lowest out-of-pocket net price at $9,900 (U.S. Department of Education, 2014)[6]. Apart from net price, it is also important to consider how students pay for their education. Students at for-profit institutions rely more on loans and receive less in grants, than students who attend other institutions. This means that more of the full cost of a for-profit education is borne by the student, in the form of deferred tuition—money that must be paid back out of future earnings.

Across all sectors, the cost of higher education has received significant attention in recent years. The for-profit sector, however, with its combination of relatively high prices coupled with greater reliance on student loans, is particularly susceptible to challenges on affordability. An analysis of the Beginning Postsecondary Students data shows that for students who began their education in 2003-04, over half of all students in the for-profit sector (52.5%) had more than $35,000 in accumulated debt. By comparison, less than a third (30.6%) of students who attended nonprofit institutions had debt levels that high, as did less than a fifth (17.6%) of public sector students. Not only are students in the for-profit sector more likely to have very high levels of debt, they are also less likely to have very low levels of debt. Just 11.6% of for-profit student have debt level under $10,000, compared to 24.1% of nonprofit sector students and 34.0% of student who attended public sector institutions.

The impact of this general point about net price and student debt in the for-profit sector can be seen through an analysis of draft gainful employment (GE) regulations

[6] The amounts listed are for full-time, full-year undergraduates.

currently being proposed by the US Department of Education. These regulations would require all programs in the for-profit sector to demonstrate that they prepare students for "gainful employment in a recognized occupation" in order to remain eligible for federal financial aid programs[7]. They would be required to have program cohort default rates (P-CDR) of less than 30%, and a debt-to-discretionary-earnings (DTE-D) ratio of less than 20% or a debt-to-annual-earnings (DTE-A) ratio of less than eight percent[8]. The for-profit sector has 264 STEM programs across 188 institutions that would fail the proposed rules as they are currently framed. That is about ten percent of all for-profit STEM programs and 20 percent of all for-profit institutions that deliver STEM programs[9]. By field of study, 19.6% of all STEM engineering technology programs fail the GE tests, while 16.3% of computer programs, and 7.5% of health programs cannot pass the proposed regulatory measures. These data suggest that students in these programs are not earning enough money to pay back the loans they took out to finance their education.

Failing the GE metrics place for-profit STEM programs in a precarious regulatory position. Loosing eligibility to participate in federal aid programs would likely result in the closure of the affected programs and could also affect the viability of the entire institution. Students, too, who attend a for-profit institution may not realize the anticipated outcome of a better job that pays more money. For the purposes of this analysis, though, it is important to keep in mind that for-profit STEM programs do not seem to be immune from weak GE results that the sector in general is facing. The for-profit sector model of high cost and high

[7] These rules also apply to all non-degree certificate programs in public and nonprofit institutions.
[8] In other words, under the DTE ratios, the average student could spend no more than 8 percent of their annual income, or 20 percent of their discretionary income, on monthly student loan payments. The P-CDR ratio requires no more than 30 percent of the students who attended an eligible program be in default on their student loans.
[9] Non-STEM programs in the for-profit sector actually fare somewhat worse on GE measures.

loans has a similar impact on the financial status of former STEM students as it does for other fields of study. This does not mean that all STEM programs are ineffective, but it does raise a caution about the presumed benefits of a STEM education in the for-profit sector.

Accreditation in the For-Profit Sector

Across higher education in the United States, accreditation serves, alongside the state and federal governments, as one leg of the regulatory triad. Although designed to ensure the legitimacy and quality of higher education, accreditation has served a quasi-governmental role as the gatekeeper to federal financial aid. Any institution that wants to enroll students with federal loans or grants, must also be accredited by one of 37 agencies recognized by the U.S. Department of Education. There are two types of accreditation agencies that can fulfill this purpose. *National* accreditation agencies typically accredit a particular type of institution, such as law schools, religious institutions, or on-line universities. And despite being called "national", some states, like New York, Pennsylvania, and Oklahoma, have their own accrediting agencies that serve this purpose for institutions within their borders. The second type of agency is known as a *regional* agency. These accredit any degree-granting institution of higher education within a particular multi-state region that meet a set of specific eligibility standards. There are six regions, ranging in size from 2 states to 19 states, that host seven agencies[10] and the number of institutions they accredit range from 134 to nearly 1200.

Out of close to 2000 for-profit institutions, there are only about 100 regionally accredited for-profit institutions. That just five percent of for-profit institutions are regionally accredited presents a much different profile than public and nonprofit

[10] The Western region has two agencies: one for four-year institutions and a separate one for two year institutions.

institutions, which are 88% and 78% regionally accredited respectively. There are 81 regionally accredited for-profit institutions that offer undergraduate STEM programs. They, however, produce about 1 in 5 graduates of undergraduate STEM programs in the for-profit sector. The clear majority (70%) of STEM graduates in regionally accredited for-profit institutions are from health fields, while 25% are in computer fields. About half of the STEM graduates from regional accredited institutions earn associate degrees, and about 40% earn bachelor degrees. The rest are non-degree certificate holders.

Credits earned at nationally accredited institutions generally do not transfer into regionally accredited institutions. This is not necessarily an indication that nationally accredited institutions are of lower quality than regionally accredited institution. Because standards of accreditation are different across all agencies, and objective measures of quality are difficult to quantify, it is not possible to develop an hierarchy based on accreditation status. It is true, however, that all of the elite and top ranked institutions of higher education, including all of the flagship public institutions, hold regional accreditation. Institutions hold accreditation not only as a measure of quality, but also significantly to gain access to federal aid programs. From that perspective, there is no difference between regional and national accreditation. Both serve the same purpose of access to federal financial aid. Moreover, most for-profit institutions are non-degree granting, and therefore ineligible for regional accreditation. Regardless of the explanation, STEM students in the for-profit sector may be limited in their transfer options if they attend a nationally accredited institution. That is a question to turn to next.

For-Profit Transfers

A possible path for STEM students is to start their education at a for-profit

institution and then transfer to a four-year public or nonprofit university to finish their degree. This is apparently rather unusual, with little in the data to suggest this happens much at all. An analysis of the Beginning Postsecondary Students survey, for example, shows few students who take high numbers of STEM credits in the for-profit sector ever transfer to nonprofit or public institutions to complete a bachelor's degree. In fact, the transfer rate is so low that no numbers are provided in the publicly accessible data because there were too few cases to meaningfully report[11]. This is not because for-profit students take an insufficient number of STEM credits—14.5% of four-year and 9.3% of two-year for-profit students take 40 or more credits in STEM—nor is it because transfer from for-profit to public or nonprofit sectors never happens. Approximately three percent of for profit students transfer to four-year institutions and earn a bachelor's degree according to the Beginning Postsecondary Students survey.

Different accreditation patterns between the sectors may have some influence here, but there would be little reason to think these differences would disparately impact STEM students. It seems, rather, that something specific about transfer in STEM is preventing students who start in the for-profit sector from earning a bachelor's degree in another sector. It is not clear what that mechanism would be, but it is surely worthy of further investigation in order for the full potential of the for-profit sector in STEM to be realized.

A few lessons can be drawn from this analysis. First, the for-profit sector is a significant producer of credentials in these areas in the aggregate. At the same time it has a distinctive array of programs when compared to the public sector. The similarity of

[11] On the other hand, transfer from the for-profit sector to the public or nonprofit sectors does occur, albeit rarely: just 0.6% of students with high numbers of STEM credits from a public or nonprofit institution earn their bachelor's degree from a for-profit school.

program areas between the two sectors, however, demonstrates that they can serve a single market for students in certain areas. Why students might chose a for-profit institution over a public institution—or vice-verse—is worth exploring from this perspective. If similar programs are offered, it would be good to examine differential outcomes, especially with respect to student debt, employment, and wage earning to determine relative value for these important STEM fields. An initial review using GE metrics suggests that the high cost-high debt model preferred by the for-profit sector may diminish the economic value of a STEM credential to a student from a for-profit institution. Whether this can be attributed to program quality, accreditation differences, or other organizational characteristics is not known. The potential contribution of the for-profit sector to STEM capacity in higher education should be tempered by the potential for more limited outcomes and options if students choose this path.

Institutional Comparisons

For-profit higher education represents a distinctive institution in the United States. For-profits are different than publics and nonprofits in the programs they offer and the students they serve. But the sector is internally diverse as well. It makes sense to explore some of that diversity as it relates to STEM program delivery. The first point is that most for-profit institutions are rather small and award relatively few credentials overall, and even fewer in STEM fields. But some are quite large and represent significant producers of STEM credentials. The University of Phoenix, for example, is the largest institution of higher education in the country. Its online campus alone awards almost 21,000 credentials in STEM each year, most of which are bachelor's and associate degrees. UEI College awards over 8,000 credentials, nearly all of which are non-degree certificates. There are eight other

for-profits that awarded over 2,000 STEM credentials apiece in 2012. I will provide a brief profile of one of these—Grand Canyon University.

Grand Canyon University (GCU) was founded in 1949 as a Christian nonprofit university. It was purchased by a for-profit corporation in 2003, and conducted its initial public offering in 2008. GCU has a unique business model for the for-profit sector, combining a traditional residential campus in Phoenix with an explicitly Christian mission. At the same time it has a large and growing online presence that represents over 80% of its enrollment. It is a diverse campus, reporting 30 percent Hispanic and African American students enrolled at the institution. The undergraduate program is primarily focused on the residential campus. The top five programs for undergraduates include biology, nursing, business management, psychology, and exercise science. In STEM fields, enrollment on campus is split between biology and health professions, almost all bachelor's degrees. Online, however, the institution boasts a huge bachelor's degree in nursing program that trains nearly 20% of all students in the for-profit sector at that level. This shows a unique element of the sector, in that a few specialized institutions can dominate a field of study in a way that the broader public and nonprofit sectors cannot.

A much smaller institution, Monroe College, also deserves a profile. It represents the tradition of family-owned for-profit institutions that have remained focused on serving their community with student-centered programs that resonate in the local labor market. It was founded in 1933 in the Bronx, NY and was shortly after purchased by the Jerome family who run the college to this day. It is predominantly an on-campus institution, with a second location in the New York City area and a third location overseas in St Lucia. Monroe

is also a diverse campus, with over 70 percent of the student body African American or Hispanic at its Bronx location; it is in one of the poorest zip codes in the United States. The overall enrollment is about 7,000 students, with about 700 graduating in STEM fields in 2012. The primary areas are computer sciences and health professions, with about two thirds associate degrees and the rest at the bachelor's level. The biggest programs however, are an associate's degree in medical office administration and an bachelor's in health services administration, which are more reminiscent of a business field than one in a core STEM discipline. Other significant programs are in community health and information technology. The Monroe case shows a typically small, family owned for-profit institution. It has the capacity to develop programs targeted to its community and has successfully demonstrated its ability to successfully serve a poor minority student body. To that end, the State of New York has contracted with Monroe to provide a registered nurse program for inner city students, demonstrating how a for-profit institution can be used to meet a public goal for education service.

Conclusions

This review of the for-profit sector's contribution to STEM production in the U.S. suggests the scope and scale of what these institutions currently do, as well as what they do not do. Several conclusions seem relevant here.

- For-profit institutions clearly graduate a significant number of STEM students every year: nearly 400,000 in 2012 alone. The broad categories provided by IPEDS data, however, likely include a set of programs that are more administrative than technical in their orientation. Still, there is substantial capacity in the sector that is being devoted to STEM fields.

- The STEM production is dominated by certificate programs, and even more so by health related certificate programs. These have direct value in the job market but may not be the areas that policy-makers are focusing on when they speak of the need for more graduates in STEM.
- A few institutions produce a significant proportion of STEM graduates, particular at the bachelor's level. This suggests that targeting access and completion at a few highly productive institutions could have an outsized impact on the total number of STEM graduates.
- The online expertise of the for-profit sector suggests the institutions would be particularly effective at promoting access in areas where no comparable programs exist. At the same time, some STEM fields are not conducive to online training. The experience of for-profit institutions with online nursing programs is instructive as it meets a high demand area and produced most of its bachelor's degrees through online programs.
- Following from the above, it is also clear that the for-profit curriculum is rather narrow in terms of the numbers of graduates produced. But that should not lead to the assumption that all for-profit institutions have constricted curricula. Some institutions produce graduates in a wide range of fields, and in the aggregate, most fields represented in the public and nonprofit institutions are represented in their for-profit cousins.
- It may be difficult to use the capacity of the for-profit sector at lower levels of education, and facilitate transfer to public and nonprofit institutions to complete the bachelor degree. This path seems to be closed for the vast majority of students for reasons that

remain unclear.

- Recent regulatory issues suggest that a concern with expensive programs for students and issues with completion and loan repayment create the need for a cautious partnership if resources are to be provided to expand the sector's capacity in STEM. In other words, students may be provided with opportunity to study at a for-profit institution, but at a cost that is prohibitive for their long-term success.

There is real potential for the for-profit sector to contribute to STEM production in the U.S. It has the capacity to serve more students, and the enrollment-driven market focus to create new programs. Because the sector also focuses on access and recruits easily from a diverse student pool (Kinser, 2009), for-profit institutions can also provide opportunity for more underserved populations to enter—and graduate from—STEM fields. With due caution associated with the problematic behavior of some owners and managers of for-profit institutions, and potential difficulties associated with accreditation and transfer, the sector should be part of the policy equation to provide new pathways to STEM education.

References

Business-Higher Education Forum (2010). *Increasing the Number of STEM Graduates: Insights from the U.S. STEM Education & Modeling Project*. Washington, DC: Business-Higher Education Forum.

Chung, A.S. (2008) For-Profit Student Heterogeneity. MPRA Paper No. 18967. Accessed April 8, 2014. Available: http://mpra.ub.uni-muenchen.de/id/eprint/18967

Chung, A.S. (2012).Choice of for-profit college *Economics of Education Review*, *31*. Pp. 1084–1101.

Deming, D. J., Goldin, C., & Katz, L. F. (2012). *The For-Profit Postsecondary School Sector: Nimble Critters or Agile Predators? The Journal of Economic Perspectives, 26*:1. pp. 139-164

Khurana, R. (2007). *From Higher Aims to Hired Hands: The Social Transformation of American Business Schools and the Unfulfilled Promise of Management as a Profession*. Princeton, NJ: Princeton University Press.

Kinser, K. (2005). A Profile of Regionally-Accredited For-Profit Institutions of Higher Education. In Brian Pusser (ed.). *Arenas of Entrepreneurship: Where Nonprofit and For-Profit Institutions Compete.* pp. 69-84. New Directions for Higher Education. San Francisco: Jossey-Bass.

Kinser, K. (2006). *From Main Street to Wall Street: The Transformation of For-profit Higher Education.* Association for the Study of Higher Education (ASHE) Higher Education Report. San Francisco: Jossey-Bass.

Kinser, K. (2007). Dimensions of Corporate Ownership of For-Profit Higher Education. *Review of Higher Education*, 30(3). 217-245.

Kinser, K. (2009). How the For-Profit Sector Contributes to Access in U.S. Higher Education. *Enrollment Management Journal*, 3(4). pp 23-44.

Knepper, E. G. (1941). History of business education in United States. Ann Arbor: Edward Brothers, Inc.

Mettler, S. (2014). *Degrees of Inequality: How the Politics of Higher Education Sabotaged the American Dream*. New York: Basic Books

Miller, J. W., and Hamilton, W. J. (1964). *The independent business school in American education*. New York: McGraw-Hill.

Snyder, T. D. (Ed.). (1993). *120 years of American education: A statistical portrait*.

Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

Wiseman, R. (2011, August 16). Enrollments Plunge at Many For-Profit Colleges. *The Chronicle of Higher Education*. Accessed April 8, 2014. Available: https://chronicle.com/article/Enrollments-Plunge-at-Many/128711/