The Ties that Corporatize: A Social Network Analysis of University Presidents as Vectors of Higher Education Corporatization

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ABSTRACT

In this paper we demonstrate how social network analysis can model the extent and type of corporatization theorized to be occurring in U.S. higher education by tracing presidents' career histories from a heterogeneous sample of U.S. colleges and universities (n=215) across not-for-profit public universities, for-profit universities and corporations. We find two distinct network typologies between public universities and for-profit universities with very few paths connecting the two. Minority serving institutions and corporations are present in both the public and for-profit network. There are seven times the number of corporations than baccalaureate colleges; doctoral universities are the most numerous type of institution in the entire network. We find that roughly half (54%) of university presidents began their careers in a tenure track position suggesting diverse career pathways for university presidents are common. But, there are limits to these alternatives: Despite embracing a fully corporate model of higher education, for-profit colleges share very little direct knowledge capital with traditional higher education at the leadership level. These findings are consistent with claims of higher education's increasing corporatization. They also suggest mechanisms for the increased dominance of market logics in not-for-profit higher education reside in prestigious extra-institutional sites like large firms, elite professional services and non-profit boards.

INTRODUCTION

There is little debate left about if U.S. colleges and universities have become supplicant to the market. Instead, researchers increasingly ask how corporatization or “academic capitalism” occurs. With variation by prestige, institutional type, and financial solvency, colleges and universities become more corporate by pursuing various profit-generating schemes (Berman 2012; Rhoades 2014; Slaughter and Rhoades 1997), adopting labor arrangements consistent with private sector norms (Tuchman 2009), and creating incentives for “entrepreneurialism” among faculty, staff and students (Armstrong and Hamilton 2013; Brienza 2016). One way to think about these different practices is to group them by formal rules and informal rules. The formal rules of academic capitalism include shifting away from tenure faculty to contract or term academic labor. Informal rules include adopting university discourse that emphasizes higher education’s individual value as opposed to its public good. With this in mind, when researchers have sought to identify how not-for-profit universities come to behave more like businesses, they have identified mechanisms loosely related to the formal and informal ways that organizations become more similar (see: isomorphism). The formal mechanisms are more easily identifiable, and reasonably, this is where much of the research on academic capitalism has occurred.

Universities become more like firms when they pursue intellectual property for revenue and prestige (Steck 2003), when they use investment vehicles to grow their endowments (Eaton, Habinek, Goldstein, Dioun, Godoy, Osley-Thomas 2016), and when they develop for-profit entities within the organizational structure explicitly designed to create products that will compete with market-based firms (Slaughter 2014). Mechanisms in the informal realm of corporatization are slightly less studied but there is growing interest in how culture, discourse,

and other forms of non-material capital shape universities into corporations. Researchers have identified the influence of state and federal funding schemes that incentivize universities to adopt market language like human capital and entrepreneurialism (Hirschman and Berman 2014). Berman (2012) examines how incentives motivate academic researchers to partner with firms in ways that seem to reinforce the idea that higher education cannot be trusted to “innovate” without adopting corporate ideologies. And, the rising cost of higher education, both in absolute costs and opportunity costs, creates pressures for students to view their educations as transactional (Tomlinson 2016). With financial pressures to generate revenue, universities respond by conceptualizing students as consumers and the university as a business. Recently, researchers have explored how the more specific process of financialization, or participating in financial sector transactions such as investment growth strategies, produce board interlocks that transmit financial industry cultures into universities (Eaton et al 2016). Social networks become a critical mechanism for the transmission of the cultural beliefs that normalize corporate practices in higher education. As yet, there is a limited body of research examining the social networks and their role in increased university corporatization. For this reason, we do not have a clear grasp of just how corporate, or financialized, higher education has become or of the mechanisms that make universities adopt corporate sector practices.

In this paper, we aim to “examine how the adoption of financialized practices and strategies is embedded in particular networks, professional projects and conceptions of control” (Eaton et al 2016) by using social network analysis to model university leadership as vectors for knowledge capital. We adopt the financialization framework because concepts like “neo-liberal” are difficult

to operationalize. In a culture where neoliberalism is arguably hegemonic, everything is neoliberal to a certain degree. In contrast, financialization refers to a set of behaviors related not only to financial transactions but how participating in those transactions shifts an organization's priorities in ways that increase institutional stratification (Armstrong and Hamilton 2013; Tuchman 2014; McMillan Cottom 2017). By shifting a university's focus to revenue maximization strategies, financialization can shape the entire organizational context of academic labor, student flourishing, political power, and public trust. If powerful actors translate "good" universities as financially-sound institutions that pursue revenue-generating financial activities, then universities may pursue financial activities at the expense of any of the many other non-revenue generating missions that compete for a university's finite resources. In this research, we conceptualize the corporate university and its related practices as indicative of financialization, or advanced capitalism with a coherent if not always internally-consistent ideology that shapes legitimate university practices. The financialization of a university includes not only hiring investment managers or leveraging real estate holdings but also by adopting the cultural norms of financialization. As work organizations, the flow of knowledge production through the people who occupy roles within the university is a key way by which financialized practices travel across institutions. In this paper, we conceptualize university presidents as critical vectors for the transmission of financialized practices and strategies. We understand university presidents as individuals with career histories that predispose them to acculturation to norms consistent with traditional higher education or with corporations, respectively. Roughly speaking, ascending to university president after a career as an academic is assumed to produce networks and logics consistent with ideas of the university as a faculty-governed engine with a public good mission.

In contrast, university presidents who ascend to the executive office without academic training *and* with previous corporate employment are assumed to be acculturated with practices consistent with financialized, revenue-seeking practices. But, we do not only conceive of university presidents as individuals in an organizational role. We also understand that the selection of a president with career histories more closely tied to traditional or corporate networks of knowledge reflect the attitudes of state and governance boards (Useem 1989). These actors have great sway over the selection of a university president in the not-for-profit sector, similar to those power relations that shape all manner of not-for-profit organizations in the image of financialized firms (Carroll 2008). A university president therefore reflects the values of other interlocking networks that are important in the transformation of U.S. higher education. To probe the migration of beliefs about financialization from the private sector to the corporatization processes reshaping universities, we use social network analysis to model connections between different types of institutions across the career histories of university presidents.

LITERATURE REVIEW

Social scientists have been preoccupied with the transformation of universities into businesses for decades, especially social scientists critical of the practice. By the 1990s, there was a consensus that higher education institutions were embracing the logic of the market. This was a marked departure from the “golden era” of higher education in the mid-20th century when demographic population booms, military spending, and industrialization spurred historic levels of higher education investment through public investment. By the 1990s, public investment in

higher education, especially at the state level, had flatlined and would begin to decline during The Great Recession (Rhoades and Slaughter 1997). To compensate for declining financial support, universities (especially, public universities) began to pursue a range of revenue-generating activities. College sports programs grew in stature at many universities because they increased alumni donations and boosterism. Research universities exploited changes in the Bayh-Dole act that allowed public institutions to generate revenue from intellectual property (Rhoades and Slaughter 2004). And, an entirely market-based sector of for-profit colleges and universities began its wall street era of massive growth (Deming, Golden, and Katz 2013; McMillan Cottom 2016 [this will need to be redacted for submission]). These changes in higher education behaviors coincided with broader cultural shifts away from “great society” programs (of which higher education had been a huge beneficiary because of the GI Bill) and towards privatization (Rhoades 1990). Public colleges, by decree, could not wholesale privatize but they could signal their ideological commitment to the values of privatization that important stakeholders like politicians valued by pursuing piece meal privatization. Some universities doubled-down on their role as “anchor institutions” that pursued economic maximization through public-private partnerships with local and regional impact (Bowie 1994). Public universities like the University of Michigan were, by the 1990s, lauded for shifting its focus from public funding to aggressive strategies like “increased private fundraising, continuously raised tuition, and supported entrepreneurial faculty members in their quest for larger shares of both federal money and industry partnership” (Newfield 2008:194) . More recently, universities have fully embraced revenue-seeking strategies as formal curriculum, as seen in the growth of “entrepreneurial studies” courses and degree programs (Volkman 2004). All of these practices are generally

legitimized by the perception that higher education must demonstrate their fiscal responsibility to disgruntled publics.

One way universities demonstrate their value to critical stakeholders caught up in the throes of markets-over-social-programs fever is to behave more like the successful firms with high status in our culture. Few sectors of the private sector are as ascendant as financial firms (Martin 2002). Driven to pursue both revenue and prestige, universities adopt financial sector behaviors. Universities turned to financial firms to manage their endowments, in part to manage risk of declining revenues but also to demonstrate fiscal responsibility. Universities have also increasingly welcomed personnel from the financial sector and from corporations that embrace the tenets of financialization as routine business practice. When Timothy Wolfe was appointed president of the University of Missouri in 2012, faculty and some alumni were aghast at his lack of academic experience. He did not have a PhD, and his primary preparation for the job was, according to the Trustees who selected him, his business experience with firms that all innovated the financial practices that animates so much of our research on work, organizations, and inequality: “lean” operating, “flexible” workforces, and leveraged buyouts. One study called his presidency “transformational”, in part because “he comes to UM system after a 20 year career in IBM, three years in a consulting firm, and seven years with Novell Software” (Bayar and Kearns 2014:156). Wolfe’s hiring was part of a larger trend in hiring so-called “non-traditional” university presidents, or presidents with little or no academic experience. Research on the effectiveness of non-traditional university presidents is nascent. But, there is a great deal of debate about the trend of non-traditional university leaders as synecdoche for the larger

problem of how neoliberal, privatization and financialization logics move public goods away from their mission in the pursuit of profit, with all embedded inequalities among groups, workers, and publics implied (for example, see: McKenna 2005). While there has been little empirical investigation, research does generally conclude that the university president is organizationally important for how it reflects organizational values and reproduces norms about higher education.

The question of just what values and norms university presidents bring with them is not clearly defined in the literature. Scott Beardsley has one of the few recent works on what he calls traditional versus “non-traditional” university presidents (2017). Beardsley argues that the traditional university president path had been, until the 1970s, fairly consistent: academic tenure in one’s discipline, followed by administrative roles culminating with earning the Provost position and then being hired away as university president. Non-traditional university presidents are those who move into the role of university president without having earned tenure, ever been in a tenure-track role, and not having served in middle administration roles. To the question of just how empirically true is the belief that universities have become more welcoming of non-traditional presidents, Beardsley finds that of 248 liberal arts colleges (selected from U.S. News & World Report and including institutions across sector) in 2014, one-third had non-traditional presidents. He argues that number represents “significant growth” between 1974 and 2014. Himself a former non-traditional university president, Beardsley does not define non-traditional pathways as necessarily corporate. But, most of the non-traditional university presidents in his sample are coming from corporate positions. The rest are coming from what we might call

corporate-adjacent bodies, e.g. powerful non-profits and think tanks. Similarly, The American Council of Education's survey of university presidents finds that in 2012, twenty percent of all U.S. not-for-profit university presidents hailed from corporate backgrounds, a 13 percent increase from 2006 (double-check my statistic by scanning the report and cite it here). We find little empirical data on the corporatization of universities through leadership pathway changes that 1) focus on public universities 2) theorize those pathways as vectors for the transmission of financial cultures 3) that analyzes what these pathways mean for different sectors of higher education. Because our interest is in the extent by which university presidents have become not just more non-traditional but more enmeshed in the norms of financialized corporate capitalism, we define pathways in this study as *academic* and *corporate*. Academic presidents are those who have 1) previously held a tenured or tenure-track eligible position in a U.S. university. Drawing on a host of literature about how ideologies are informed and reproduced through organizational practices, we assume that an academic president whose professionalization occurred through status competition among faculty will be acculturated to the norms of traditional academic leadership: faculty governance and public good missions. Drawing on a host of literature about how capitalist ideologies shape the everyday practice of organizations, legitimate practices, and facilitate upwards redistribution of capital, we assume that actors professionalized through high-ranking positions in financialized firms will be acculturated to those norms: rent-seeking, profit-taking, and bureaucratic authority over shared governance. Corporate presidents are those who 1) have not previously held a tenured or tenure-track eligible position *and* 2) whose previous employment roles include a corporate position. As far as we know, no research has examined these pathways in the context of literature on higher education stratification, corporatization, or

financialization. Operating from these concepts we then turn to literature on just what a university president, either academic or corporate, brings to a higher education organization.

Organizationally, the university president role institutionalized norms and practices that shape the university culture. These norms are frequently contested. Research cites how new university presidents negotiate culture change through various strategic practices. One study finds that university presidents understand their newly acquired leadership responsibilities through the priorities communicated to them by university trustees during their employment courtship (Smerek 2017). Many university presidents cited “changing” or “fixing” the university culture as a number one reason given to them by trustees for their hire. And, many of them interpret that change as bringing more “fiscal discipline” and other related economic logics to a recalcitrant university culture where faculty and “old school” administrators resist change. The change those faculty are often resisting is the change associated with financialization: measurement, control, and resource deprivation (Tuchman 2009) .

University presidents likely draw on many resources to enact change and manage university cultures. A critical resource for any organizational leader is the networks they bring with them to the role. Networks include extra-institutional connections, such as the boards on which they serve and the alumni communities of which they are members. Networks also include the shared knowledge accumulated from previous organizational contexts. Smerek finds that new university leaders rely heavily on previous work experiences to bring sensemaking to their new organizational contexts (2017). This often generates conflicts between new leaders and existing

staff. Presumably, university presidents bring with them to their role networks of relationships from extra-institutional entities and networks of knowledge practices that inform how they make sense of the priorities on which the university stakeholders who hired them expect them to execute.

Social network analysis (SNA) (Kadushin 2011; Wasserman and Faust 2017) applies graph theory to a collection of actors who are related by various ties. Many studies have focused on the relationships between and among individuals, but SNA has also been used to study organizations such as businesses, often by looking at their interlocking boards of directors (Lamb, Roundy, and Roundy 2016; Sankar, Asokan, and Kumar 2015; Takes and Heemskerk 2016). In this study we apply social network analysis to U.S. colleges and universities using the career paths of the institutions' presidents as vectors of cultural and normative knowledge transmission. Eaton et al. (2017) suggest that the increasing financialization of colleges and universities may result from the sharing of ideas and practices via links in networks of the colleges and universities. Likewise, the growth of academic corporatization may be a result of network dynamics. Many researchers have found that network structure plays a critical role in influencing the behavior of people and institution (see Scott & Carrington, 2011 for complete review). This study extends that research to the contemporary context of higher education where new institutional types (e.g. for-profit colleges) have expanded and the political climate necessitates more evidence that higher education is a defensible public investment on its merits. Using university presidents' career paths as proxies for the way in which cultural knowledge moves within the university organizational context, we ask:

1. How are the various sectors of higher education, i.e not-for-profit universities, for-profit universities, and historically black colleges and universities connected?
2. What role do external organizations, i.e corporations, government and/or military play in the network?
3. How similar are the networks across higher education sector, i.e not-for-profit universities, for-profit universities, and historically black colleges and universities?
4. Which organizations play the most powerful role, as defined by degree centrality, in shaping the career paths of university presidents?

In this study, we argue that the career pathways of university presidents form a ‘cultural production system’ whereby “networks of collaborating organizations guide the flow of symbolic goods from creators to gatekeepers to publics” (DiMaggio 2011:286). As people move among universities, they are inculcated with cultural capital (Bourdieu 1983) and disseminate the culture of the academy as they move across universities (Degn 2015; Stensacker 2015). By modeling these ties between institutions, we provide what we know to the best of our knowledge as one of the few empirical pictures of how corporate entities and non-traditional universities interface with traditional public universities to shape the kinds of social and cultural capital transported to the public university. We also examine these differences across different sectors of higher education, owing to extant literature showing that not-for-profit and for-profit colleges, as well as predominately white institutions (PWI) versus historically black colleges and universities (HBCUs), might have different exposure to networks of cultural and social capital. While this

goes beyond the scope of this paper, the larger project from which it draws goes further to understand how these differences might diffuse corporatizing logics across different sectors of higher education because of processes linked to inequality, e.g. prestige, endowments, and status. One of the more important contributions of this paper and the project from which it is drawn is to demonstrate how social network analysis can bring conceptual clarity to claims about the corporatization of public goods.

METHODS

There are 4665 colleges and universities of all types in the U.S. Of these, we chose to interrogate the career histories of the presidents of the members of the APLU (American Public and Land Grant Universities). Membership in the APLU requires regional accreditation and is automatically granted based on Carnegie research classification or via petition directly to the APLU. We chose the APLU because the literature on corporatization and financialization has largely focused on the transformation of public colleges and universities. There are 237 APLU institutions in the U.S. (including U.S. territories and all 50 states), Canada, and Mexico. Of those, 205 had identifiable presidents and English websites. Nearly one quarter of HBCUs (historically black colleges and universities) are represented in the network because these institutions were created by the Morrill Act 1862, a federal law that established the U.S. land grant universities. Nearly all APLU entities grant bachelors, masters, and doctoral degrees. Most of these entities are public, representing the largest public universities in the U.S. One school on the list, American Samoa Community College, grants two-year (associate) degrees. A total of ten for-profit, regionally accredited universities were also included in the analysis. The ten for-profit universities include eight that grant bachelor's, master's, and doctoral degrees, and two that grant

associate degrees. Four-year private colleges are not included in our original seed list. The total number of seed nodes was 215.

From May 2017 to September 2017, the president of each of these institutions was identified and the the career histories and educational preparation of each president was collected. Career histories - including the employer, job type, and years on the job - and educational preparation were found using publicly available information including university biographies and curriculum vitae posted online, LinkedIn, and Google searches. Only the president's career history is included in this analysis. A sample career path used for the analysis follows. The current president of a public university (University "A") in the midwest became president of that university in 2014. After obtaining a doctorate in higher education, this president began their career at a large midwestern university (University "D") in that school's financial aid office for 13 year. This president then moved to another public university (University "C") as the Vice-Chancellor for Student Affairs and Enrollment Management. After 15 years in this position, the president then was named a Special Assistant to the President of a different public, midwestern school (University "B") while being awarded tenure. Finally, the president moved to the University "A" as the Vice-President for Student Affairs for three years and ultimately as the President of University "A". Thus, Universities A, B, C, and D would all share a link among them because they share employment of the same person. University C is one of the original APLU institutions, so we also collected the career history of the current president of University C. The president of University C worked for University "E", so a link appears between University C and E. We then used the Carnegie classification system to categorize the all

universities according to the three main types--Doctoral, Masters and Baccalaureate. See Table 1 for a list of types of nodes (organizations) in the network.

Table 1: Node attributes (alphabetical order)

Code	Description
BU	colleges that award baccalaureate degrees
CC	community college
CORP	any type of business entity, including, for example, law firms or veterinary clinics
DU	universities that award baccalaureate, masters, and doctoral
FED GOV	the U.S. government, including laboratories or political positions
FP	for-profit colleges and universities
HBCU	historically black colleges and universities
K12	teachers at the K12 level
MED	medical college
MIL	military, such as the U.S. Army or Navy
MU	universities award baccalaureate and master's degrees
NL	national laboratory
NP	non-profit
ST GOV	state government positions, included elected officials

Social Network Analysis

Social Network Analysis (SNA) is a descriptive methodology used to map and measure how relationships are patterned inside diverse social structures and how those patterns influence resource flow, behaviors, interactions, opportunities, choices, and power of the social actors who are operating within. Theoretically, the approach takes seriously the sociological axiom that all

social actors, including both people and organizations, are positioned in and influenced by larger social structures (Laumann & Knoke, 1986; Wasserman & Faust, 1994). SNA utilizes relational data to produce both sociograms and rank ordered metrics describing both the position of individual nodes within the network as well as the structure of the network as a whole. A sociogram is a visual representation of the nodes and the links between them. For the purpose of this study, the node is the organization and the link between them is the president; for example, if a president held a position at University X and then joined the faculty at University Y, there would be a tie between the two universities as nodes in the network. The ordered metrics rank the nodes according to the centrality of their position in the network; what role does that university play in that network and how important is that university to the overall flow of the network? The current analysis also utilizes the SNA metric of degree to identify the central players or hubs in the network. Degree centrality measures the influence of a node by number of connections it possesses; in other words, how many links radiate out from the node in the visual map. In other words, degree measures how many career paths include that particular university.

SNA Software

The data is saved as a text file of edges and imported into Jupyter Notebook for analysis.

Network graphs were generated using Gephi (Bastian, Heymann, and M. 2009).

RESULTS

The complete university network in this study has 570 unique nodes and 1406 edges. The sociogram describes the network of these institutions and is visualized in Figure 1 using the

Force Atlas layout in Gephi with no overlap. Scaling and gravity are set to maximize the visibility of all the nodes while also keeping the isolates visible.

Figure 1: Organization Network of Career Path of 2017 Sample APLU and For Profit Presidents.

Core/Periphery Structure

The resulting network has a strong core and a disconnected periphery. A core/periphery network is one where social, economic and/or cultural power is distributed between a dominant connected core and a marginal, dependent and/or disconnected periphery (Borgatti and Everett, 2000). In this case, the core is the large collection of nodes in the center of the sociogram which is dominated by public doctoral universities, represented in purple. Doctoral universities are 42.1%

of the entire network and are 47.9% of the core (See Table 2). Corporations, represented in bright green, are the second most numerous type of node in the network occupying 20.8% of the entire network and 17.4% of the core. Doctoral universities and corporations combined constitute 62.9% of the entire network and 65.3% of the core indicating that the culture of the academy is shaped by the relationship between these two entities.

Table 2: Type of entity compared to the percent of all nodes*

TYPE	% of nodes in the entire network (N=547)	% of nodes in the core component (N=426)
Doctoral Universities	42.1	47.9
Corporations	20.8	17.4
Master's Universities	9.9	9.4
HBCU	5.5	4.9
State Government	3.8	4.2
Federal Government	3.3	3.3
For Profit Universities	3.1	0.7
Baccalaureate Universities	3.1	2.8
Military	2.6	3.3
K-12 schools	2.0	2.6
Community Colleges	1.1	1.2

*including only nodes with percentages greater than 1.

For-profit universities are marginal to the overall university network occupying only 3.3% of the entire network and 0.7% of the core. While the for-profit universities are also tethered to corporations, they do not share connections to the same corporations as that of public non-profit universities. There are a total of 20 for profit universities in the entire resulting network, and all but three of the for-profit universities are located on the periphery. Of those on the periphery, two

for-profit universities fall along the career paths of a public university president; Post University and Capella University, are each linked to one non-for-profit university, University of Michigan Dearborn and University of Minnesota Extension, respectively. Conversely, 65% (11 out of 17) of the for-profits located on the periphery are linked to corporate entities. The main component of the network contains three for-profits (Kaplan University, Thunderbird School of Management, and Berkeley College of New York New Jersey). Of note is that Kaplan and Thunderbird have recently merged with Purdue University and the University of Arizona, respectively. Overall, for-profits and not-for-profits function in separate spheres of influence, have little to no overlap, but are both connected to corporations and other non-academic entities albeit different ones. All of this suggests that while not-for-profit and for-profit universities are both enmeshed in the same forces of corporatization and financialization, they are not engaged in the same knowledge networks.

Historically Black colleges and universities (HBCU) are located in both the core and the periphery. HBCU's are the fourth most numerous type of institution representing 5.5 % of the entire network and 4.9% of the core. However, within the core, HBCU's operate at the margins with little direct connection into the center of the network. Thus, while HBCU can access cultural capital from both regions of the network (core and periphery), direct access to the center of power among universities remains limited with leaders at HBCUs having marginalized relationships with the predominantly white universities at the core of the network.

Another point of note is the scarcity of Baccalaureate universities in the sample. Only 3.1% of the entire network and 2.8% of the core were Baccalaureate institutions. It is rare to find a university president with experience at a university which focuses exclusively on the undergraduate learning experience.

Career Paths

Approximately 54% of the university presidents in this network began their career in as a tenure-track professor. The other 46% followed non-traditional paths began their career in administrative roles or in a non-academic positions such as in a corporation, military or government. Among those institutions in the core with presidents who began their careers as on the tenure track (n=###), 65% are doctoral universities, 12% are masters universities and only 4% of nodes in this network are corporate. Among those institutions in the core with presidents who did not begin their careers on the tenure track (n=###), 37% of them are doctoral and 7% are masters universities, but the proportion of corporate nodes is significantly higher at 28%. This data suggests that acculturation to a corporatization practices and beliefs is a common occurrence for university presidents.

Degree and Power Law

Not only are doctoral universities the most numerous in the network, but they also are the most well connected. Table 3 lists those universities with the highest degree scores as defined by those that were significantly higher than the next closest grouping (see Figure 2). Purdue University, Michigan University, and the University of Georgia are the three highest ranking

nodes in the network. It should be noted that though public, each of these institutions has undertaken actions embracing corporatization and financialization. The actions of the University of Michigan are described above. Purdue recently purchased one of the largest for-profit college companies in the world, Kaplan. The purchase required rewriting state law, with many lauding the move as the future of higher education (Jackson 2017). Similarly, the University of Georgia recently underwent what might be called a corporate consolidation plan, wherein it merged several institutions and centralized bureaucratic control among them.

Table 3: Degree Centrality of highest ranked institutions

INSTITUTION	DEGREE
Purdue U	18
U of Michigan	17
U of Georgia	15
U of North Carolina	15
Texas A & M U	14
Auburn U	13
Mississippi State U	13
U of California Berkeley	13
U of Kansas	12
West Virginia U	11
Columbia U	11
Southern Illinois U	10

U of Colorado Boulder	10
Washington State U	10
CUNY	10
U of Utah	10

The degree distribution in the entire network approximates a power law (Figure 2) whereby a few nodes have high degree scores and a majority of nodes have low degree scores. Networks that follow power laws are ‘scale free’ because they occur through preferential attachment rather than random occurrences thus they do not follow a random distribution curve. Actors will seek connection to already highly connected or prestigious nodes to coat tail off the cultural and social capital of the preferred node. Preferential attachment creates ‘hub’ networks dominated by a few highly connected nodes leading to escalating inequality and a concentration of power or influence in the network (Barabasi, 2009; Barabasi & Bonabeau, 2003).

Power law is calculated by....

Figure 2: Power Law Distribution of Degree Scores

Our data indicate that the career paths of university presidents follow a power law with a few prestigious doctoral universities dominating the cultural production system of the academy. Just 3% of the nodes in the network have 11% of the edges all of which are doctoral universities. A majority of nodes (56%) in the network have just two edges and 22% are pendants (one edge). While doctoral universities dominate the network, corporations play a significant secondary role and are strategically appended to maximize their influence.

CONCLUSION

In this study we set out to determine what network analysis reveals about the corporatization of U.S. higher education using the career paths of university presidents as a proxy for shared values, cultures and beliefs. First, yes, higher education can be said to be corporatized in that one can become a leader of a public college without any public college experience *precisely because they are corporate actors*. But corporatization, as a term, may not reveal as much at certain levels of abstraction. Due to their size, scope, and mission, doctoral universities were still the most central node in this network. Doctoral and masters universities, with their emphasis on research occupy 85% of the nodes in the network and maintain the status quo by hiring presidents whose backgrounds look similar to the current culture of the university. To the extent that professionalization to tenure-track faculty cultures predisposes one with beliefs and norms of academic leadership versus corporate leadership, these academic presidents are still the likely university president. Academic presidents typically begin their careers as assistant professors at an APLU institution, and they move to administrative positions at other APLU institutions thus creating homophily in the university president network. This self-replication and the dominance of particular types of institutions creates a hegemonic academic culture across the larger university network. We offer this analysis with some caveats. The rank ordering of which doctoral universities are most central to the academic presidents' network suggests we look more closely at the context of doctoral universities that are at the top. The top three universities in this network are those who have been lauded by powerful actors for their embrace of corporate logics and financial sector behaviors. We cannot say that any academic president from these institutional cultures would be progressively pro-faculty control, for example. But, we think the conceptual difference between these presidents and corporate presidents still holds. If nothing

else, an academic president who has spent her entire career in academia has far fewer corporate contacts in her personal network when she ascends to presidency than would a corporate executive.

Corporate entities are more significant in the full university network than baccalaureate colleges. In fact, the full university network has almost seven times more corporate nodes than baccalaureate college nodes. One out of five nodes in the university network are corporate; only doctoral universities have more nodes in the network. Corporate nodes are found throughout the network and connect to most other types of nodes; the corporate presence is disseminated across the network with the resulting capacity to exert wide influence. Insofar as actors from the corporate sector are more desirable to public college leadership than an actor from a baccalaureate university, our results mirror the research of Eaton et al. (2017), who found that universities are becoming more *financialized*, adopting more corporate financial practices. The networks described here likely reflect the reality that the academy is not and never was wholly an “ivory tower” where the financial concerns of the institution are secondary. But the networks also likely reflect the cultural shift away from the traditional core mission of the university as an altruistic public good and towards a revenue-seeking firm with ideological interest in financialization.

Despite the rapid, recent growth of the for-profit universities, very few for-profit universities are linked to the dominant doctoral, masters, or baccalaureate universities and colleges. For profit universities make up 3.4% of all the nodes, but they make up less than 1% of a weakly-connected network of for-profit college presidents. Presidents of the for-profit universities have

career paths through other for-profit universities or in companies, primarily those in the educational sector such as academic publishers. The sample size is much smaller than the public one, but certainly the for-profit university network also has a high degree of homophily.

The absence of connections between the for-profit universities and the APLU institutions suggests that there is little flow of human capital in either direction. Cottom and Tuchman (2015) noted that not-for-profit universities are valued for their prestige, whereas for-profit universities must be valued for their quarter-over-quarter financial gains. The network analysis suggests that the corporatization of the academy may be driven by university presidents who have corporate backgrounds rather than those who have experience in the fully corporate for-profit college sector. University boards may desire candidates who have corporate experience or who have led successful careers outside the academy. But, the for-profit universities remain outside the prestige sphere of the academy, according to the network analysis of university presidents' careers. Further research should consider how prestige among corporations, extra-institutional actors and between sectors of higher education stratifies the types of financialization practices that turn public colleges into corporate-lite organizations.

We began this analysis by arguing that we should understand university presidents as both networks and as flows of knowledge capital. In so doing, we could better describe how corporatization unfolds through the adoption of logics consistent with the ascendancy of financialized capital. And, we argue that these flows are a more precise conceptualization than the generally true claims that higher education is more corporate than has been previously modeled. Social network analysis allows us to capture how actors and institutions intersect with

ideologies and various forms of personnel filtering that make organizations mimic each other across sector. This analysis is one paper from a larger project that explores how ideologies, professionalization, and organizational roles are critical sites of inquiry for understanding how dimensions of capitalism (here, “financialization”) are reshaping public goods. We model one way that the ideas about how a public good should operate travel across markets and institutions. We find that the corporate university president is more typical than previous literature has described. In our sample, corporations are second to doctoral-granting institutions as central producers of university presidents: 40.5 percent of university presidents have never held a tenure track eligible or tenured position in the academy. That is higher than the 33 percent found by others (Beardsley 2017) of the most comparable statistic we could find in the literature.

We also put a finer point on how similar or dissimilar is corporatization between for-profit and not-for-profit universities. This is important because recent literature has convincingly argued that for-profit colleges represent a fully corporatized higher education institution. To that literature we can now add that despite sharing ideologies about the supremacy of market behaviors like investment, maximization, and weak labor not-for-profit universities still draw the line at sharing knowledge capital directly from the for-profit college sector. Or, it could be the other way around: for-profit colleges may not value the kind of knowledge capital they inherit from university leadership even if they share ideological leanings. These two sectors have fairly distinct networks of knowledge flows, represented by actors and organizational roles. Future research might isolate why these two networks share an ideology but few actors or institutions. We also contribute another dimension of how corporatization of higher education may be true at the highest levels of abstraction but may not explain every sector of higher education sufficiently.

We compare the networks of predominately white institutions with historically black colleges and universities. Following research on organizations as racialized (Seamster and Ray 2017; Wooten 2017) we find that the context of HBCU personnel filtering seems to shape academic presidents networks differently than those at both PWIs and for-profits. Whatever these contextual differences, research in this area should conduct due diligence to exploit these comparative cases to better understand how dimensions of corporatization interact with different sectors of higher education.

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Table 1: Nodes From APLU Institutional Data, by Carnegie Institutional Type

Table 2: Node types

Code	Description
DU	universities that award baccalaureate, masters, and doctoral
NU	universities award baccalaureate and masters degrees
CU	colleges that award baccalaureate degrees
HBCU	historically black colleges and universities
CORP	any type of business entity, including, for example, law firms or veterinarians
FP	for-profit colleges and universities
GOV	the U.S. government, including laboratories or political positions
MIL	military, such as the U.S. Army or Navy
SG	state government positions, including elected officials
MC	medical college
K12	teachers at the K-12 level
CC	community college
NL	national laboratory
NP	non-profit

Figure 1. Complete Network

Table 4. Universities With The Highest Degree of Centrality Figure 2. Core Component of the Main Network Table 5. Nodes in Core Component, By Percentage of Overall Sample

Table 4. Universities with the highest degree centrality

INSTITUTION	DEGREE
Purdue U	18
U of Michigan	17
U of Georgia	15
U of North Carolina	15
Texas A&M U	14
Auburn U	13
Mississippi State U	13
U of California Berkele	13
U of Kansas	12
West Virginia U	11
Columbia U	11
Southern Illinois U	10
U of Colorado Boulder	10

Figure 3. Core Component of Academic Presidents' Network Figure 4. Core Component of Corporate President Network Addendum 1
POWER LAW

The network follows a power law as shown in the Figure 3. Just 3% of the nodes in the network have 11% of the edges. These 16 nodes are all doctoral universities In contrast, over half (56%, N=311)) of the nodes have just two or fewer edges, and 22% of the nodes (N=121) are pendants. The [majority? - need to get the number/%] of pendant nodes are corporate entities. Likewise, [## %] of nodes with two edges are corporate.

Wasserman, Stanley and Katherine Faust. 2017. *Social Network Analysis*. New York: Cambridge University.

29 Table 2. Nodes From APLU Institutional Data, by Carnegie Institutional Type

Table 5. Type of nodes in the main component

TYPE	% OF NETWORK
DU	48.1
CDRP	17.0
VU	9.5
HCU	4.0
STGOV	3.7
FED	5.2
MIL	3.3
RII	7.8
K12	2.8
CC	1.2
FP	0.7

Figure 1. Complete Network

Table 4. Universities With The Highest Degree of Centrality Figure 2. Core Component of the Main Network Table 5. Nodes in Core Component, By Percentage of Overall Sample

The network follows a power law as shown in the Figure 3. Just 3% of the nodes in the network have 11% of the edges. These 16 nodes are all doctoral universities. In contrast, over half (56%, $N=311$) of the nodes have just two or fewer edges, and 22% of the nodes ($N=121$) are pendants. The [majority? - need to get the number/%] of pendant nodes are corporate entities. Likewise, [## %] of nodes with two edges are corporate.