

## **The Societal Effects of Higher Education: Cross-National Analyses, 1960-2012**

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December 2, 2016

Word Count: 13,250 (including tables and references, but not appendices)

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### **Abstract**

The rapid expansion of higher education during the recent decades of world liberal dominance is having transformative effects around the globe. Higher education is mainly understood as a source of human capital, but has much broader consequences: 1) It sustains the modern professions and contributes to the rationalization of society and state. 2) The supra-national and universalistic orientation of higher education provides elites with common cultural frames and identities, contributing to globalization on many dimensions. 3) Expanded tertiary education provides a foundation for major global movements and socio-political change around such issues as human rights, environmental protection, and also conflictful religious and cultural solidarities. 4) Higher education is linked to the reorganization of society in ways that create new monetarized activities, and facilitates the reconceptualization of activities distant from material production as economic. The social effects seen by earlier skeptics as costly or threatening are now considered and measured as positive – as part of the economy of the “knowledge society.” These general points are elaborated with cross-national longitudinal data for the contemporary period.

## **Introduction**

Higher education has expanded enormously around the world during the past century (Douglass, King, and Feller 2009; Schofer and Meyer 2005). This has created a huge population of people highly schooled in institutions that by and large claim a common rationalistic and universalistic culture. Further, the schooling is formalized with credentials that are institutionalized in society, and are central elements in stratification systems (Meyer et al. 2007). We examine the effects of this transformation, which may be seen as a new chapter in the evolution of the “schooled society” (Baker 2014).

Schooling is conventionally understood as a source of human capital, a primary basis for worker productivity and economic growth (Psacharopolous 1984). Even sociological analyses of reproduction frequently accept this basic framework (but see Collins 1979). However, the conceptual linking of education to the economy is recent. Mass education in Europe was largely a religious and political enterprise, tied to ideological projects such as religious and national community-building -- especially the incorporation of citizens into emerging nation-states (e.g., Ramirez & Boli 1987; Maynes 1985).

Mass schooling transformed European societies, helping to forge the modern nation-state, the democratic citizen, and the industrial worker. Imposed on an often-reluctant populace, schooling knitted diverse ethno-linguistic groups into national citizens with a common language and identity (Weber 1976). Education and literacy created novel possibilities for communication and interaction, expanding the public sphere and facilitating new forms of mass civic and political organization (Anderson 1991; Furet and Ozouf 1982). The contemporary democratic polity, now widespread across the globe, rests on the foundation of schooled citizens (Meyer, Ramirez, and Soysal 1993; for the U.S. see

Kaestle 1983). In addition, mass schooling yielded a labor force capable of serving growing industrial economic organization (Stinchcombe 1965). But this was neither the original impetus for public schooling, nor its sole consequence.

The latter half of the 20<sup>th</sup> century saw the advent of “mass” higher education. We predict consequences as seismic as the impacts of mass schooling a century before. Higher education creates global citizens organized around universalistic expertise and scientific knowledge, and sustains a cultural frame that is linked across societies and built into certificates of great collective meaning and legitimacy (Meyer 1977; Kamens 2012). Moreover, higher education drives the increasing rationalization of society and state, propelling new forms of organization, binding countries together in a world society, and empowering much social mobilization.

These changes, originally often seen as undercutting or deflecting from material production, are now increasingly interpreted and measured as economic: monetarized, they support a growing post-industrial service or “knowledge” economy, by creating new kinds of occupational roles, but also by changing conceptions (and measures) of economic activity (Block and Burns 1986; Davis and Kim 2015). For example, activity in the academic field of sociology, a dubious enterprise from the point of view of traditional business elites, is now treated and measured as valuable economic activity.

### *Background: Higher Education Expansion*

The period since World War II has seen a global wave of higher educational expansion, centered on the institution of the university (Schofer and Meyer 2005). At the start of the 20<sup>th</sup> century only the tiniest fraction of the world’s population – under one-half

of one percent of a cohort -- went to a university. Now, higher education has become a part of a modal life course in the developed world.

The participation in higher education accelerated in the 1960s in affluent countries and soon after in the rest of the world. Gross tertiary enrollment ratios in excess of 90% in places like South Korea and Finland now seem quite normal (UNESCO 2015), but expansion also occurs rapidly across the global South. UNESCO data show tertiary enrollment rates in Botswana at 25%, and war torn Sudan at 17% -- and reveal rapid expansion in the post-Communist countries, with Mongolia at 62%. Overall, more than 20% of a global cohort is now enrolled in tertiary schooling, and perhaps a quarter or third participate at some point in their lives. Even if one allows for error in these statistics, and for some variability in what counts as “higher education” in the poorest nations, the growth is extreme. To put this in historical context, Britain did not reach an enrollment ratio of 25% – where Botswana is today – until 1990 (UNESCO 2015).

As with mass education, the original focus of higher education was not principally economic, and expansion was not clearly tied to labor market demand (Windolf 1997). Born out of monastic traditions in Europe, universities mainly produced clergy, lawyers, doctors, and academics – professionals filling highly specialized roles in society. At the time, scholars and observers did not predict that legions of young people would or should attend. Analysts did not imagine that a radically expanded set of professionals could be needed or absorbed by the labor market. Some argued that peasants or factory workers might benefit from the discipline of mass education, but few imagined they would profit from reading Plato or studying calculus. At the time, it was routinely debated whether

lower-class individuals – widely thought to be of lesser stock than elites – were capable of imbibing higher knowledge (Soares 1999).

More generally, it was debatable whether higher education had practical utility at all. The older view is reflected in one meaning of the term “academic”: knowledge that is of no practical use. Andrew Carnegie captured the sentiment:<sup>1</sup>

*“Men have sent their sons to colleges to waste their energies upon obtaining a knowledge of such languages as Greek and Latin, which are of no more practical use to them than Choctaw. ... They have been 'educated' as if they were destined for life upon some other planet than this. ... In my own experience I can say that I have known few young men intended for business who were not injured by a collegiate education. Had they gone into active work during the years spent at college they would have been better educated men in every true sense of that term.”* (Carnegie, 1889, pp. 20-21, cited in Ris 2015)

Carnegie’s view, widely shared, had several dimensions. Standard centrist views saw expanded higher education as a waste of time and resources – a consumption good, not a useful investment. Even today, we wonder if much is learned in college (Arum and Roksa 2011). Thus Harbison and Myers (1964) emphasized the value of secondary education for developing countries, but warned against rapid university expansion. From a more conservative point of view, higher education was not only wasteful, but might be politically and psychologically damaging. Masses of unemployed intellectuals would be an obvious source of political disorder or revolution (Lange 2012; Huntington 1968). Schumpeter (1950) thought that the intellectuals produced by capitalism might actively destroy it.

The view from the left was often similar: the working class should focus on its own economic power, and not be distracted by status pretension. In the 1970s, this became the standard position of authorities in Communist countries: power should lie in the hands of

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<sup>1</sup> Carnegie later changed his tune and became a major supporter of higher education.

the working class and its party, not in mandarin schooled expertise. While communist countries established systems of higher education, almost all of them attempted to limit expansion around that time (Lenhardt and Stock 2000; Stock 2003; Baker et al. 2004). This was consistent with their manpower planning perspective: economic needs should determine educational opportunities.

Thus, well into the 1970s, people across the political spectrum routinely bemoaned “overeducation.” The titles tell the story: “The Overeducated American” (Freeman 1973); “The Diploma Disease” (Dore 1976); “The Great Training Robbery” (Berg 1970); and “No Salvation outside Higher Education” (Shils 1971). Furthermore, Boudon (1973) and Collins (1979) offered penetrating and influential criticisms of higher educational expansion. Boudon critiqued as inflationary the emergent faith in education as an instrument for occupational mobility, emphasizing the fixed character of the occupational system. Collins also saw the inflationary character of the credential society, characterized recent changes as a status competition driven “bubble”, and predicted an eventual bust.

Social upheaval in response to expanded education did not come to pass, but the transformations that followed were nevertheless revolutionary. The growing legions of graduates tended not only to fill up society’s elite positions, but also to dramatically expand them. Their attitudes, sense of empowerment, and knowledge of the world were systematically altered (Kamens 2012). In one sense, the critics were right: higher educational expansion generated many elites beyond – and sometimes in opposition to – the economy, traditionally conceived (Brint 1994; Manza and Brooks 1999).

What the critics did not anticipate (but see Bell 1973) was that ideas and measures of the economy would be re-conceptualized to treat the formerly-wasteful political and

social goods produced by higher education – including its intellectual critics – as economically valuable components of a “knowledge society”. Conceptions of modern society as a beneficial or destructive instance of something called “capitalism” did not anticipate a future in which people distinguished by their schooling rather than their control over political power or the means of production would occupy many of the highest positions in society.

### **Theorizing the Consequences of Higher Education**

Neo-institutional theories of education point to broad-based effects of education on society, over and above the training and socialization of individuals (Meyer 1977; Baker & LeTendre 2006; Baker 2014; Thomas et al. 1987; for a review see Stevens, Armstrong, and Arum 2008). Schools confer widely recognized identities. They legitimate key forms of knowledge and expertise, and link them to occupational and social categories that are often constructed by the schooling systems themselves.

Drawing on these insights, we discuss some consequences of expanded higher education for society as a whole: (a) Radically expanded organizational structures, populated by professionalized persons; (b) Globalized forms of interaction, linking local activity to more universalistic cosmologies; (c) Much social mobilization, legitimated by schooled ideologies; and (d) changes in concepts and measures of social progress, such that schooled notions of value take precedence over mundane material ones in social understandings – and measures – of development.

The effects we discuss undoubtedly occur through multiple levels of social structure. Individual-level educational socialization processes, in aggregate, can drive social change



(Coleman 1986): much of the “impact of college” literature emphasizes these effects (Pascarella and Terenzini 2005; Hout 2012). But socialization aside, education creates and legitimates new roles in society; it culturally empowers new forms of knowledge and new elites (Jepperson and Meyer 2011). The arguments and empirical analysis of this paper do not adjudicate between such more institutional effects and more immediate socialization ones. We assume that both sorts of processes operate, and that they may reinforce each other (Meyer 1977): the education that trains people in economics, for instance, also legitimates economists to be public policy advisors.

#### *Professionalization and organizational rationalization*

*Professionalization.* Expanded higher education helps establish and populate a growing set of occupational categories rooted in academic knowledge (Drori et al. 2003; Drori and Moon 2006). Institutions of higher education turn out professionals, and expansion produces the often-noted increases in the size and scope of professional occupations (Wilensky 1964). At a more collective level, expansion also serves to construct and legitimate the authority of rationalized knowledge. Individuals acquire academic and professional knowledge – but *everyone* in society becomes aware that such authoritative bodies of knowledge exist, are comprehensible, and inform dominant understandings of the world. Whether or not people pursue professionalized training in business administration, for instance, they learn that the field exists and that the relevant knowledge and expertise may be called upon to improve the functioning of organizations.

Growing numbers of professionals bring society under their purview, and growing numbers of higher-educated individuals organize activity under such expertise. In

developed countries like the United States, professionals make up the largest occupational category (Wyatt and Hecker 2006; Brint 1994). This has mainly been analyzed in terms of the benefits that may accrue to professionals themselves, with the establishment of new (and sometimes exclusive) domains of specialized expertise (e.g., Abbott 1988). But there are broader consequences. The expanding professions, rooted in the university and science, systematically rationalize social life wherever they go. This increasingly occurs on a global scale (Drori et al. 2003; Fourcade 2006). Doctors, psychologists, and educational professionals transform child-rearing practices, supplanting traditional forms of advice. Economists and MBAs remake the world of business. Psychologists reshape our understanding of personal relationships. Medical professionals increasingly inform dietary practices. The actual content of professionalized knowledge does not necessarily provide a solid bedrock of objective truth.<sup>2</sup> But many individuals are immersed in higher education, and others also understand the legitimating rules involved. Even anti-science reactions, e.g., around vaccines or climate change, typically invoke pseudo-professional language and experts.

*The organizational revolution.* The elevation of the professions and scientific knowledge, and the training of individuals along those lines, contributes to the rationalization of society. Schooled people function within highly-rationalized organizations and bureaucracies. They have greater capacity to create them, and to order their activities around rational/legal understandings (Bromley and Meyer 2015). So the rapidly-growing body of social science research on formal organizations is largely about the behavior of schooled people.

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<sup>2</sup> For instance, there is much debate and historical variability in medical advice regarding diet or economic prescriptions for macro-economic planning.

Higher education supports the creation of formal organizations, and within organizations helps structure activity in rational-legal terms, yielding greater standardization, systematization, and transparency (Bromley and Meyer 2015). This tends to supplant traditional organizational relations rooted in particularism – kinship and patronage – increasingly re-characterized as “corruption” (Drori, Jang, and Meyer 2006), or as the “moral basis of a backward society” (Banfield 1958). Thus, the growth of higher education is particularly likely to create and reshape what is now called governance (Miller and Rose 2008), or “governmentality” (Foucault [1978]1991). Higher education shifts public, non-profit, and private organizations toward rational/legal frameworks, increasing transparency and potentially reducing both traditional corruption and informal community.

*Proposition 1: Higher education expands and elevates the professions, and leads to the organizational rationalization of both society and state. Societies with expanded higher education will have more professional activity, more formal organization, and more rationalized governments.*

These changes are often celebrated, but critics point out troubling consequences: new forms of governmentality, potent regimes of discipline and control, new “iron cages”, and the erosion of traditional and organic social relations (Foucault [1978]1991; Scott 1998; Miller and Rose 2008). Critical literatures arise in many areas – medicine, mass education, higher education, the charitable world, formal government, and the giant sector of large profit-making firms. These literatures – for all their tendencies to sentimentally celebrate past “golden ages” – find much to criticize in the sweeping rationalization of the current period (e.g, Ellul 1964; Putnam 2000).

*The creation of participants and relationships in a global society*

The worldwide use of the name “university” embodies the pretension to transcend time and space, as a site of universal knowledge (Frank and Meyer 2007). After its medieval origins, universities fell under the aegis of ascending national states and other forms of higher education emerged, but the orientation to supra-national knowledge and community persisted. In most national contexts, higher education is deeply enmeshed in international communication (often using global languages: originally Greek and Latin, now English), organized around scientific and professional knowledge, and linked in multiplex ways to other institutions of science and education around the world.

One indication of the global orientation of higher education is that university curricula tend to draw upon standard categories, and curricular forms diffuse rapidly (Frank and Gabler 2006; Frank and Meyer 2007; Frank, Robinson, and Olesen 2011). In Cameroon and Taiwan and Costa Rica, students may study such subjects as “organic chemistry”, “microeconomics”, or even “introduction to sociology.” The organizational structures of higher education are diverse, reflecting variations in national political forms (Clark 1983), but the character and categories of knowledge have important homogeneities: reciprocally recognized fields, courses of study, and degrees. Similarities in both organization and content are intensified through harmonization efforts, such as the European Higher Education Area, aspiring to render educational experiences and credentials uniform and universal in meaning and value (Teichler 2002). Similarities are also produced and indicated by the rise of putatively universal, and surprisingly unidimensional, standards of university ranking. The aspiration to produce world-class universities (now acronymic as WCUs) arises in many countries (e.g., Shin and Kehm 2013; Ramirez and Tiplic 2014).

As growing numbers of people experience higher education, they are trained in common subjects, socialized in common ways, stamped with globally-meaningful credentials, and thus linked with each other through common identities. Certificated training in economics or industrial engineering will likely be met with recognition anywhere. Further, the identities generated by higher education are known to be very highly valued in stratification systems around the world: the education of individuals and of occupations, essentially everywhere, are central ingredients and indicators of social position (Shavit, Arum, and Gamoran 2007).

In short, higher educational expansion generates a very large global class of people of high and common status, with the capability (and often the inclination) to communicate, interact, and organize transnationally. As a result, the expansion of higher education facilitates the joining or establishment of international organizations. It becomes easier to create an international environmental NGO, for instance, if people accept a common set of scientific and professional authorities and skills (e.g., biologists, environmental engineers).

In addition, higher education may facilitate state-to-state interaction and cooperation in the world polity. It has long been recognized that scientific and professional “epistemic communities” sustain inter-governmental cooperation (Haas 1992). Similarly, senior civil servants and policymakers across the globe, now typically university-educated, share common degrees and professionalized knowledge. The highly educated elites in Britain that established EU membership share much in common with their counterparts across Europe. Indeed, possession of a college degree appears to be the most decisive predictor of support for EU membership versus “Brexit” (McGill 2016).

Higher education also expands the possibilities for international economic activity. A common linguistic, educational, and professional background, not to mention the greater orientation toward rational/legal organization described above, reduces actual and perceived transaction costs and provides a basis for trust, facilitating cross-border investment and international joint ventures. Furthermore, modern economic activity on a global scale is facilitated by lawyers, accountants, MBAs, and other sorts of specialized professionals – not to mention economists (Fourcade 2006). These are all creatures of higher education, and they grease the wheels of international commerce.

These international orientations and interactions increase prospects for supra-national cooperation, but also for competition and conflict to be aggregated to supra-national levels. Individuals, organizations, and national states, acting on globalized frames, can readily find grounds for conflict rooted in issues of interest and identity organized on very large scales. In the United States, for instance, one sees common people and governmental elites pursuing massive global agendas on all sorts of normative grounds, ranging from free market ideologies to LGBT issues to animal rights. In the United States, and around the globe these initiatives are sometimes welcomed but oftentimes provoke reactions. Not surprisingly, the proponents of the global agendas tend to be more schooled than are the critics (Kamens 2012; The Economist 2016).

*Proposition 2: Higher education increases global integration, facilitating supra-national interaction and cooperation, as well as competition and conflict. Countries with more higher education have more participation international treaties, more ties to international organizations, more international economic relations, and more potentially conflictful conceptions of interest and identity.*

*Societal mobilization and social change*

It is well known that mass education predicts conventional political participation, such as voting (Almond and Verba 1963). We argue that higher education propels new kinds of global mobilization, around issues such as the environment, human rights, gender inequality, corruption, global inequality, or cultural and religious ideologies.

*The rise of shared opinion frames.* Higher education infuses schooled people with so many generalized views that opinion research can now be carried out in many more countries than would have been possible a few decades ago (Lerner 1958; Jepperson 1992). Further, opinions are formed on large-scale issues that reach beyond national states: the status of women or gay people; environmental problems, dimensions of human equality and human rights, or the concentration of power in large corporations. Unschooled people tend not to be able to articulate responses to these sorts of issues in universalized terms (Lerner 1958). The World Survey of Values can now query many individuals from many countries on these kinds of questions (Inglehart and Welzel 2005).

*Transforming opinion into action.* Further, by establishing a large transnational class of people immersed in common (e.g., professional) frames, higher education transforms the potential for collective mobilization and change at national or supra-national levels (e.g., Allendorf and Thornton 2015; Thornton et al. 2015). Basic schooling affords people the capacity and standing to protest a foul-smelling town dump, but higher education and professionalization expands collective possibilities for quantifying environmental harm, establishing associations to oppose environmental problems, formulating grievances in terms of abstract and universalized principles, and launching effective challenges in legal and political arenas. In a world teeming with professional, legal, and scientific expertise, and filled with globally-oriented higher-educated individuals, it is easier to establish pro-

environmental social movement organizations like Greenpeace (Meyer et al. 1997). It is also easier for schooled people to mobilize locally and supra-nationally around large-scale political and ideological movements focused on a range of religious, environmental, or human rights issues. Lange (2012), for instance, shows ways in which expanded education is associated with large-scale ethnic mobilization and conflict.

*Turning shared action into organizational structure.* Higher educational expansion, as noted above, increases the social capacity for social movements to become organized (Davis et al. 2005), thus becoming actors on national and supra-national scales. Massive numbers of social movement organizations and “NGOs” arise in world society, promoting such goods as human rights, democracy, environmental protection, and transparency (Smith 2007; Boli and Thomas 1999; Schofer and Longhofer 2011; Suárez and Bromley 2012). Much empirical work focuses on movements generally seen as progressive (e.g., human rights), but oppositional and reactionary movements also rise to prominence, and are increasingly organized to operate on a global scale. The leaders of the most conflictful movements of the whole modern period, on the left, the right, and the nationalist center, have been schooled people (e.g., Lenin, Mao, Mussolini, Saddam Hussein, Castro). And many of their core followers have, too: educated people are commonly involved in significant social movements of all sorts. Social movements opposed to the rights of women and gay people, or to the imposition of environmental rules on local contexts, or to democratic organizational rules, are increasingly common (e.g., Walker 2014; Lange 2012) and the people involved are often highly educated, and employ the language of the schooled.



*Proposition 3: Higher education increases the potential for societal mobilization and social change. Countries with expanded higher education will have more mobilization of opinion and action devoted to social, political, cultural and economic causes.*

*Monetarization: the reorganization and reconceptualization of economic activity*

Finally, we turn to the economy, the issue that receives the lion's share of attention. It is conventional to see higher education as augmenting human capital and labor productivity. Moreover, it is often argued that higher education supports technical innovation. Not only should these accelerate economic growth, but the overall effect is to render the modern world a "knowledge society" (Gibbons et al. 1994, Nowotny et al. 2001).

Beyond this, expanded education drives another set of changes that are less often discussed: conceptions of economic activity have shifted. The rationalization of society and state, described above, contribute to a re-conceptualization whereby formerly non-economic activities, or even things seen as costly to economic growth, come to be viewed and measured as economic in character. Practically everywhere, what is called the service sector of the economy expands more rapidly than traditionally economic arrangements of industry and agriculture. Old activities once considered consumption are now seen as economic investments. Areas of life once managed informally – care of young and old, medical and religious services – are now heavily monetarized, and conceptualized as part of an expanded economy. They are included in the common measures of economic progress – centrally, the Gross Domestic Product, now used worldwide. There is a striking contrast with older notions of the economy as material production, reflected in earlier indicators such as Net Material Product that was used in, and died with, the Communist world.

For example, childrearing has become scientized and professionalized over time. The grandmother providing instruction and childcare has given way to an array of rationally managed activities. There are paid professional daycare providers, often with academic credentials. Child psychological and educational development issues are codified and funded: new fields such as special education emerge, and the elaborate management of newly-defined problems, such as ADHD, follows (Powell 2011). Even such a specialized task as the management of entry into higher education is rationalized and monetarized: we see the rise of SAT tutors, college application consultants, admissions officers, and so on. All of these new or reformed domains of activity are now seen as part of the economy and contribute to the measured GDP; the grandmother did and does not.

We argue above that major societal mobilizations – including environmentalism and human rights – are propelled by higher education. These may seem likely to slow economic growth, for instance limiting the ability of firms to exploit natural resources or workers. But these movements involve great expansions of professionalized activity. Companies must perform extensive environmental testing of product safety. New development projects require elaborate environmental impact evaluation and reporting, involving masses of environmental professionals and consultants. Stringent pollution regulations render old production methods and infrastructures outmoded, and necessitate massive investments in new technologies and production methods (Hoffman 1997). All of those expenses are counted as productive activity within the GDP. Even the lawsuits launched by pro-environmental groups, or costly environmental remediation efforts that result, are part of the GDP. Thus, countries with stringent environmental laws perform well in terms of aggregate GDP growth (Schofer and Granados 2006).

In societies teeming with higher education, professionals, and social movements, there is much opportunity for the reconstruction of economic value (Zelizer 1994, 1997). Individuals may pay more for organic produce, dolphin-safe tuna, cage-free chicken eggs, or fair trade coffee, based on elaborate theories of human, animal, and environmental well-being. Managers can justify the costs of worker training and consulting regarding issues of gender equality, diversity, or sexual harassment in the workplace, not only due to regulatory requirements but also due to elaborate theories about workplace productivity (Dobbin 2009). One may chalk some of this up to consumers and managers being “better informed” than in the past, but that only scratches the surface. Economic value often hinges on professional theorization (Fourcade 2011; Strang and Meyer 1993). The value of fair trade coffee, for instance, rests on many layers of theorization (e.g., regarding the nature, morality, and potential remedies for global inequality) and rationalized organizational structure (e.g., creating “transparent” and effective certification regimes). Such an edifice would be hard to imagine in the absence of higher education and the modern professions.

Were national accounting based wholly on the material production of a society, as was the case in the Communist world, the effect of higher education might be uncertain because huge sectors of activity now have little to do with production. Firms have vastly expanded administrative, accounting, human resource, and legal superstructures (Bromley and Meyer 2015). New fields of non-productive activity emerge, involving consulting, legal, and financial services. One obvious example is the rise of “financialization”, whereby a sizeable fraction of the resources of affluent economies is now channeled into increasingly elaborate and abstract economic instruments (Davis and Kim 2015). These may or may not

increase economic efficiency, but regardless, the conventional measures of economic progress rise.

Another example is growth of the non-profit sector, with voluntaristic activity and charity increasingly professionalized, populated by specialists with MBAs in non-profit management, and accounted as part of the economy (Bromley and Meyer 2014; Bromley, Hwang, and Powell 2012). The fact that such activities are included in modern definitions of economic activity means that expanded higher education almost tautologically means and generates growth.

*Proposition 4: The expansion of higher education leads to greater economic growth through increased human capital and innovation, and through the rational-legal organizing of many activities as part of the service economy. The economic effects of higher education will, thus, be largest in the service sector of the economy.*

## **Data**

We evaluate the effects of expanded higher education on a wide range of social, political, and economic outcomes using cross-national data using panel regression models. Analyses focus on the contemporary period, 1960-2012, though some analyses do not cover that full span due to missing data on particular outcome variables.

### *Dependent variables*

#### *1. Measures of professionalization and rationalization (Proposition 1)*

*a. Professions.* The growth of the professions is measured by the number of professional organizations in society, taken from the *Associations Unlimited* database, which contains information more than 30,000 organizations worldwide (Gale 2012). We used the Gale categories to identify professional groups. The measure includes both traditional professional organizations (lawyers, accountants) as well as associations of scientific

professionals (civil engineers, geologists). We take the natural log of the variable to reduce its skew.

*b. Civil society organizations (aka “associations”).* We use the Gale Group’s *Associations Unlimited* to construct a general measure of associations in country, as the total count of all organizations in the dataset (see Schofer and Longhofer 2011). The measure includes a diverse array of groups from charitable organizations to sports associations to political advocacy groups (but not churches or labor unions).

*c. Government Transparency.* We use a measure of international transparency collected by Drori, Jang, and Meyer (2006), which reflects the public reporting of statistical information to international agencies. Higher values indicate greater capacity and willingness to collect and publicly disseminate statistical data.

*d. Government Corruption.* We use the Corruption Perception Index measure of corruption in the public sector, which is based on reports and evaluations from institutions such as the World Bank, the African Development Bank and others. The measure has been recoded so that high values indicate more corruption (Transparency International 2016). Due to a change in the methodology in 2012, which rendered the scores incomparable with the past, we only analyze scores through 2011.

*e. Bureaucratic efficiency.* We combine several measures of business regulation from the World Bank’s “Doing Business Project” that reflect on the rationalization of the legal, regulatory, and bureaucratic environment. We compute z-scores and combine the following (inverting, so higher values indicate greater business efficiency): 1) The time it takes to resolve insolvency (bankruptcy) in years; 2) The time it takes to prepare, file, and pay taxes; 3) The number of steps to enforce a contract. For instance, the average time to

resolve insolvency is 1.2 years in Germany versus 5.5 years in Indonesia, due to greater efficiency and capacity of the legal system in Germany (World Bank 2014).

## *2. Measures of Global Integration (Proposition 2)*

*a. International Treaties.* We measure treaty participation by a country's cumulative number of international treaty ratifications, based on a sample of major environmental, human rights, and labor treaties. There is no single quantitative measure of all international treaty ratifications, so we constructed an index from several subject-specific databases. Environmental treaty ratifications are derived from ECOLEX, an online database of environmental law (ECOLEX 2014). Ratification of ILO conventions is available from NORMLEX, a database on labor conditions (ILO 2014). Human rights treaty ratification is published by the UN's Office of the High Commissioner on Human Rights (UN OHCHR 2014). Our index reflects ratification of twelve major environmental treaties, seven key human rights conventions, and the seven so-called "fundamental" ILO conventions (the list of specific conventions is available from the authors upon request). Results are not sensitive to selection or omission of particular treaties).

*b. Participation in World Society.* A country's linkage to world society is measured in the conventional manner, using data on International Non-Governmental Organization (INGO) memberships from the Yearbook of International Association (UIA 1971 to 2012). The measure is the total number of different INGOs that a country's citizens hold membership in, logged to reduce skewness.

*c. Participation in Environmental INGOs and Women's INGOs.* We also examine membership in particular types of INGOs, corresponding to specific issue-areas, again coded from the Yearbook of International Association (UIA 1971-2012). The coding of specific issue-areas

is very time-consuming, and thus these measures are based on random samples from the population of each type. A total of 54 environmental groups and 25 women's groups were sampled.

*d. Tourism (outgoing).* Tourism is measured by the total number of tourist departures, collected by the World Tourism Organization (World Bank 2014). The measure is logged to reduce skewness.

*e. International Trade* is measured by trade openness, defined as the total of imports and exports as a proportion of GDP (World Bank 2014).

*f. Foreign Direct Investment (FDI)* is measured as the net inflow of foreign direct investment as a percentage of GDP (World Bank 2014).

### *3. Measures of societal mobilization (Proposition 3)*

*a. Environmental Associations.* We draw upon Gale's *Associations Unlimited* to construct a specific measure of the number of pro-environmental groups in a given country (Gale 2014). We specifically exclude chapters of international organizations, in order to focus explicitly on domestic activity (see Longhofer and Schofer 2010).

*b. Air Pollution.* We measure air pollution using the natural log of sulfur dioxide emissions, a common component of power plant and motor vehicle emissions (World Bank 2014). Other measures of air pollution, such as nitrogen oxides, yielded similar results. Higher values indicate *more* environmental damage.

*c. Forest Area* is measured as total forested land area as a percentage of a country's total land area (World Bank 2014). The destruction of forest is a major form of environmental degradation. Higher values indicate *less* environmental damage.

*d. Political Associations.* We draw upon Gale's *Associations Unlimited* to construct a measure of political groups in a given country (Gale 2014). These include a wide range of advocacy, movement, and mass membership groups devoted to political causes.

*e. Human Rights.* We examine a measure of human rights practices taken from the Political Terror Scale (PTS) dataset, which includes a measure based on data from the US State Department (Gibney et al. 2015). The measure is transformed such that higher values indicate greater regard for human rights. Human rights data from Amnesty International yields similar results.

#### *4. Economic Growth and Sector Change (Proposition 4)*

*a. Economic Growth.* We study economic growth by modeling GDP per capita at time  $t$  as a function of independent variables measured five years prior ( $t - 5$ ). Another common strategy is to compute a GDP change score over the period; results were similar.

*b. Economic sectors: Agriculture, Industry, Manufacturing, Service.* We measure the shifting structure of economies in two ways: as a proportion of the economy (percent of GDP) and as the overall size (value added) per capita in constant US dollars. The former captures the structure of the economy, while the latter examines the absolute size of each sector. Note that manufacturing is a sub-set of the industry sector. All measures are taken from the World Development Indicators (World Bank 2014).

#### *Independent variables*

*Higher education.* Our main interest is in the expansion of participation in higher education, which we measure by a country's gross tertiary enrollment ratio. The measure includes



students enrolled in ISCED levels 5 and 6, which correspond to conventional understandings of higher education (World Bank 2014).<sup>3</sup>

*Population* is measured by the natural log of country population, rescaled by 10,000 to improve presentation (World Bank 2014).<sup>4</sup>

*Gross domestic product (GDP) per capita* captures a country's overall level of development and wealth, and is an important control for the outcomes we examine below. We use real GDP based on purchasing power parity (PPP) in inflation-adjusted US Dollars. Data are taken from the Penn World Table (Feenstra et al. 2013).

*Democracy.* Many outcomes addressed in this paper are plausibly affected by a society's overall level of democracy. Democracy is measured by the Polity IV twenty-one point "polity" scale, which distinguishes between autocratic and democratic societies (Marshall, Gurr, and Jaggers 2013). The Freedom House democracy measure yields similar results, but we use Polity IV because it is available for a longer span of time.

*Secondary education.* We seek to distinguish the effects of higher education over and above the effects of mass schooling, which brings literacy, numeracy, and basic integration into the national polity. Secondary education is measured by the gross enrollment ratio, taken from the World Development Indicators (World Bank 2014).<sup>5</sup>

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<sup>3</sup> Missing data in earlier years were supplemented with comparable data from UNESCO Yearbooks (defunct countries, such as East Germany, are not covered in current World Bank data files). Gaps shorter than 5 years were filled using linear interpolation (mainly an issue prior to 1980). These additions to our measure do not change results, but permit a more complete data set.

<sup>4</sup> Rescaling does not affect the results.

<sup>5</sup> Net enrollment ratios (which include only enrollees in the designated age group for a given level of schooling) yield similar results, but are available for fewer countries and years.

*Investment.* Analyses of economic growth and sector expansion include a control for the investment share of GDP, which is commonly included in such analyses (Levine and Renelt 1992). Investment data are taken from the Penn World Table (Feenstra et al. 2013).

Descriptive statistics for all measures can be found in Appendix A.

## **Methods**

Our main tables employ panel regression models with country fixed effects<sup>6</sup>, though we also consider many alternatives in Appendix C. Fixed-effects models control for time-invariant properties of each country, and focus on within-case variability over time. While not a panacea, fixed effects models eliminate omitted variable bias due to constant features of countries (e.g., region, colonial legacy, etc), avoiding some of the problems associated with comparing “apples and oranges” in a world of heterogeneous countries.

Models in Tables 1-3 employ annual data from roughly 1960 to 2012 with independent variables are lagged one year. Analyses of economic growth in Tables 4a and 4b use pooled five-year panel models and include the lagged dependent variable, following conventions in the economic literature (e.g., Barro and Sala-i-Martin 1995), though annual data produces similar results.

There is extensive debate about modeling strategies for panel data, generally, and for cross-national applications in particular (e.g., Baltagi 2008; Beck and Katz 2011; Gelman and Hill 2011; Halaby 2004; Plümper, Troeger, and Manow 2005; Wooldridge 2002).

Moreover, the performance of a particular model is contingent on many factors, including

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<sup>6</sup> We conducted Hausman tests to evaluate models with random effects versus fixed effects. Results of Hausman tests varied across outcome variables, but sometimes preferred fixed effects. To simplify presentation, we employed fixed effects in all cases, which is conservative.

the structure of the data (e.g., if it is temporally or cross-sectionally dominant), the extent of unobserved heterogeneity, the amount of temporal “noise” in the data, whether the data may be non-stationary, and so on.

Rather than claiming one approach is best for our many outcome measures, we opted to begin with a conventional approach (country fixed effects) and then explore how our findings varied across alternative specifications. We examined models with fixed and random effects, models that address first-order serial correlation (AR1), OLS regressions with panel corrected standard errors (PCSE), models of change (e.g., first differences), and models that included the lagged dependent variable. Models based on differences can be useful as a point of contrast with fixed effects models to bracket effect sizes (Angrist and Pischke 2009), and differencing can eliminate temporal trends in longitudinal data, potentially providing better estimates if nonstationarity is a concern. Models with the lagged dependent variable can address potential dynamic processes and may be more robust to some forms of endogeneity (discussed below). We also considered models with longer lags (e.g., 10 years) because one might argue that it would take some time for key independent variables to affect particular outcomes. Appendix C summarizes some of these robustness checks. Many of our findings are robust across a range of specifications; a few are not.

To simplify presentation of our many analyses, we focus on a common set of control variables across the tables. However, we also explored a large number of additional control variables, relevant to particular outcome variables. Results were generally robust, except when large numbers of highly collinear variables were included together. We also looked for influential cases using Cook’s D and by examining partial regression plots. Quite

a few moderate outliers could be found across our many analyses, but they generally did not affect results and they were not excluded. El Salvador was an extreme outlier for certain years in analyses of deforestation, and is excluded from deforestation models.

Endogeneity is always a concern. Cross-sectional models may be particularly vulnerable to bias due to reverse-causal effects, because the independent variables and the dependent variable are measured simultaneously. Our fixed effects models effectively address time-constant omitted variable bias. Additional strategies to reduce endogeneity bias include employing lags of independent variables (creating temporal separation), modeling temporal change, and/or including the lagged dependent variable (which controls for prior cumulated reverse-causal effects), which reduce potential for the dependent variable to plausibly influence independent variables. We explored these options (see Appendix C). Another strategy was to find alternative measures that avoid reverse-causal effects. The most obvious case of potential endogeneity bias involves the effect of tertiary enrollment on INGO memberships, as prior work argues that INGOs (many of which are devoted to development and education) encourage tertiary expansion (Schofer and Meyer 2005). To address this, we examined *specific sub-types of INGOs that are unlikely to encourage tertiary expansion*, such as environmental INGOs. By decomposing INGOs into sub-types, we can reduce potential endogeneity while estimating effects of tertiary enrollments on INGOs. A final strategy to address endogeneity involves the use of instrumental variables models for panel data, such as the “system GMM” estimator (Arellano and Bover 1995; Blundell and Bond 1998; Wooldridge 2002). System GMM models involve strong assumptions and diagnostics indicated potential violations of the model assumptions (e.g., the Sargan test for overidentifying restrictions), so we opted

not to make them the main focus of this paper. That said, we explored system GMM models for the most obvious cases of endogeneity, such as models of INGO membership, and results were consistent.

## Results

Table 1 presents panel regression models examining the effects of tertiary enrollment on the expansion of professional associations, civil society organizations, and indicators of the rationalization of society and state. The university originally centered on the professions, and they remain a central component. We observe that higher education is positively associated with professional associations. Mass education (i.e., secondary enrollment) is also positively associated with the professions, but the effect is modest. We also find that higher education is positively associated with the broader expansion of associations in civil society.

--- Table 1 Here ---

The last three columns in Table 1 examine features of the state. Tertiary enrollments are positively associated with government transparency and bureaucratic efficiency. In short, higher education is associated with the rationalization of the state apparatus. Again, the contrast with secondary enrollments is telling: mass education has no significant effects on the indicators of state rationalization. The effect of tertiary enrollments on corruption is in the predicted direction, but is not significant.<sup>7</sup> Control variables in Table 1 generally have plausible effects. For instance, affluent countries have expanded professional organization and civil society, less corruption, and greater

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<sup>7</sup> We examined several measures of corruption. Results varied widely in the magnitude and direction of the effect. We are hesitant to draw any conclusion.

bureaucratic efficiency. Likewise, democracy is associated with civil society, the professions, and transparency.

--- Table 2 Here ---

Table 2 explores the idea that higher education helps link societies, states, and economies together by providing common cultural frames and legitimated professionalized knowledge. Building on the classic “epistemic communities” idea, we propose that the expanded higher education facilitates inter-state cooperation. Empirically, we observe that higher educational expansion is strongly associated with international treaty ratification.

Such integrating effects are even more intuitive at the individual-level: we expect that higher education makes it easier for individuals to join and participate in common organizations and causes across the world. We explore this by examining the classic measure of world society connection: international non-governmental organizations (INGOs). We observe that higher education is strongly associated with national INGO membership counts. We further break this down by focusing on two subsets: environmental INGOs and INGOs devoted to women’s issues, which are both substantively interesting and serve as a check on the general INGO finding (see discussion of endogeneity, above). Again, we observe large positive associations, and again the effect of higher education is substantially larger than the effect of secondary education (which has a similar metric). We also see a similar positive effect of higher education on outgoing tourism. Together, this suggests that higher education facilitates global connections in world society.

Table 2 also examines measures of economic globalization. Again, we observe robust effects. In particular, higher education is strongly associated with international trade, which involves transnational business relations across societies. We also find a

similar positive effect of higher education on (incoming) foreign direct investment, which involves long-term cross-border relations. Such arrangements, we argue, are facilitated by the common identities, shared knowledge, and professional expertise generated by higher education.

--- Table 3 Here ---

Table 3 examines broad societal movements and social change in the areas of environmentalism and human rights, both of which have been the focus of international attention, treaties, international organization, and movements (e.g., Frank et al. 2000; Hafner-Burton and Tsutsui 2005; Meyer et al. 1997). We see that tertiary education is positively associated with domestic societal movements as measured by environmental and political voluntary associations. These results hold up even when we control for international pressures, such as INGO memberships and treaty ratifications (not presented here; available upon request). Beyond the social movements involved, higher education is associated with changes in societal outcomes in both the environmental and human rights domains. For instance, tertiary enrollments are associated with lower levels of air pollution emissions and lower deforestation). And higher educational expansion is associated with improvements in human rights practices. By contrast, mass education is not particularly associated with these forms of societal change. It seems the skills, organizing capacities, and shared professionalized knowledge and identities needed to foment large-scale social change tend to derive from higher education rather than mass schooling.

While higher education is positively associated with societal movements, we do not observe any hint that tertiary enrollments encourage political unrest or revolution, as

scholars and elites of previous generations feared. As a corollary analysis, we note that tertiary enrollments tend to be negatively correlated with measures of logged riots, anti-government protest, revolutions, and assassinations (data from Banks 2013; see Appendix B). These findings suggest that expanded higher education fuels greater overall participation and activism, but not violent collective action. Civil society is energized without the national state coming under siege (Hage and Garnier 1992).

--- Tables 4a & 4b Here ---

Tables 4a and 4b turn to the economy. The first model in Table 4a addresses the central question of whether higher education affects the size of the economy. The model examines overall GDP at the end of a 5-year span, with controls for the initial level of GDP and investment. While the model is quite simple, it includes the key variables shown to robustly affect economic growth in cross-national analyses (Levine and Renelt 1992; Barro and Sala-i-Martin 1995). We find that tertiary enrollment has a modest but significant positive effect on the economy, supporting the conventional wisdom that higher education boosts growth. The finding is important, as analyses of earlier periods tended not to find clear effects of tertiary enrollments.<sup>8</sup> This finding may be the direct result of increased human capital in the labor market and/or greater levels of innovation. It also may be a consequence of the elevation and expansion of the professions and expert knowledge, as well as the profusion of organizational rationalization and societal movements – now financialized, and counted in conventional measures of economic activity.

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<sup>8</sup> Null effects were prominent in research back to the 1970s (e.g., Meyer and Hannan 1979). Later work by Benavot (1992a, 1992b) led to the same conclusion. Other studies suggested that any positive effects were highly conditional (Schofer, Ramirez and Meyer 2000). For reviews, see Hannum and Buchmann 2005; Rubinson and Browne 1994; Chabbott and Ramirez 2000.



Table 4a further breaks out the economy by sector (as percentage of GDP), in order to show the impact of higher education on the overall structure of the economy. The resulting picture is very clear: higher education is associated with an overall shift away from industry/manufacturing and agriculture toward the service sector. Specifically, tertiary enrollments have large positive effects on services (as % of GDP), but negative (often insignificant) effects on other sectors.

Table 4b looks at the same issue from a different angle, examining the total value added in each sector (with the first column reprising the overall GDP results from Table 4a). Here, we see that tertiary enrollments have a positive effect that is significant for all sectors except manufacturing. The shift toward services, evident in the prior Table 4a is not due to any absolute negative effects of higher education. Rather, the shift toward services occurs because the generally-positive effect of higher education is largest for the service sector and smaller for other sectors.

### *Robustness checks*

We conducted a large number of corollary analyses to assess the robustness of our findings (see Methods). Appendix C summarizes a subset of our corollary analyses: country fixed effects, fixed effects with the lagged dependent variable, fixed effects with independent variables lagged by 10 years, fixed effects with ar(1) to address serial correlation, models with the dependent variable calculated as a difference ( $\Delta$ ), and OLS regression with panel corrected standard errors.

Appendix C shows that most findings are fairly robust, holding up in all or nearly all of the model specifications we considered. However, the most obvious exception involves

the effects of higher education on corruption: the coefficient is unstable in sign and significance. Also, analyses of government bureaucratic efficiency and human rights only yield positive and significant effects half of the time in Appendix C, and in one analysis the effect of human rights changes sign. Those results should be interpreted with caution. Appendix C also replicates the economic growth models in Table 4b. Generally, higher education has positive effects on all sectors, but effects on the manufacturing sector are not always significant. This fits with our argument that higher education may have weaker effects on industry and manufacturing, as it mainly propels growth in the service sector.

## **Discussion and Conclusion**

We advance arguments about the transformative effects of rapidly expanded higher education of the contemporary world. Universities and higher education changes national and global societies by elevating the professions, rationalizing the state and societal organizations, establishing common (increasingly global) frames, connecting local society to world society, and ultimately propelling new societal mobilizations and movements. We present regression models showing that tertiary enrollments are associated with measures of societal rationalization, national connections to the world economy and society, and social mobilization and change. Most findings are highly robust, but outcomes such as corruption and human rights yielded weaker results that were not always consistent.

We show that higher education is associated not only with expanded economic activity overall, but in particular with the very rapid contemporary expansion of the service sector. This is consistent with conventional “knowledge society” arguments, though we suggest that such effects are not merely about human capital and innovation, but a broader

re-conception of economic value around rationalized and professionalized activity. More and more economic activity, though now heavily monetarized, is distant from conventional understandings of economic production. Higher education provides the infrastructure for constructing many new kinds of economic value (Zelizer 1994, 1997).

Higher education has expanded enormously, and the university has become a central institution in contemporary society. In every social sector, the schooled people have won out. The resultant changes are depicted as economic (and they certainly are heavily monetarized), but this stretches the conception of the economic far beyond its earlier meanings.

We neither assume nor suggest that all these changes are somehow functional or inevitable. They reflect a historical period of post-World War II liberalism and subsequent neoliberalism, and would likely have differed greatly under counterfactual conditions, such as a period of German hegemony. And, the contemporary explosions of education, professionalization, and organization may not continue into the future. Indeed Collins (1979 and elsewhere) argues that higher educational expansion is a bubble that will inevitably collapse. The common observation that high liberalism or neoliberalism came under a good deal of global attack in the period since 2008 may suggest that what was earlier sometimes seen as inevitable progress has something of a character of a binge.

Advocates see the major expansions of education and organization that we describe in this paper as progress. But it is easy to find critics who are acutely aware of the dark side of rationalization, globalized professional knowledge, and rapid world integration, which can discipline and subjugate society – through political power (as in Foucault) or economic power (world systems theorists). For example, the contemporary regime of

institutionalized schooling and childcare, combined with medicalized child management, has yielded an epidemic in diagnoses such as ADHD, and millions of children are prescribed drugs like Ritalin so they can sit still all day. Whether this represents social progress or a dystopic experiment may be a matter of perspective.

The societal mobilizations enabled by higher education may be quite heterogeneous and conflictful. The top leaders of Al Qaeda, for instance, appear to have attended universities (as did Communist elites in an earlier period). Global integration can globalize formerly local ethnic conflicts (Lange 2012). Moreover, the sweeping rise of schooling and the professions clearly threatens some traditional institutions and elites, producing reactionary movements, and in some cases ostentatious anti-intellectualism (e.g., among supporters of Donald Trump, who disproportionately lack college degrees).

Our study suggests useful directions for scholarship. Sociologists might consider a broader set of individual and especially collective consequences of education beyond economic ones and might be more skeptical about contemporary tendencies to see everything rationalized and monetarized as economic. At the individual level, higher education might propel a wide range of outcomes, changing people's relation to professional and political authorities, augmenting their efficacy and political involvement, and providing the basis for global/universalistic worldviews and interactions (for instance see Kamens 2014; Thornton et al. 2015). Moreover, higher education may have substantial effects on those who do not attend. Penalties for non-attendance likely increase as the world becomes organized in terms of higher education understandings and credentials (Hout 2012; Fan 2015; Baker 2014).

At the level of organizations, expanded higher education propels rationalization, and facilitates the interpenetration of firms and their increasingly rationalized external environment. Whether this renders firms more efficient is not clear, but it makes them more like rationalized “actors” (Bromley and Meyer 2015). At the country-level, this paper offers some initial empirical efforts, but much additional work could be done to explore processes of rationalization and global integration.

Our study also has important implications for world society theory. The tradition has focused on formal international structures, especially INGOs, IGOs, and treaties, both for purposes of measurement and as the conceptual lens for understanding *what world society is*. We suggest that the higher education is a primary basis for the construction of world society. Virtually all the participants in international governance and the international NGO sector are the products of higher education. Universities play a central role in the global diffusion of ideas and policy models (e.g., Frank et al. 2011). And, the cultural content of world society, described by Boli and Thomas (1999), includes many elements that are, to varying degrees, institutionalized and propagated by higher education, such as commitments to universalism, science, and rationalized voluntaristic authority. If INGOs are an embodiment of world culture, higher education is surely its foundation. Beyond simply measuring human capital, higher educational expansion may serve as a useful measure of collective integration on a global scale.

And if all this is true, the continuing hyper-expansion of higher education will have profound implications for the international system by greatly expanding the number of potential participants and connections in world society. The potential effects on transnational organization, activity, and movements may be enormous.

However, it is clear that populist and nationalist social movements are on the rise, challenging a global liberal order. A view from the left sees transnational capital as undercutting the social order. A similar perspective arises on the right, linked to nationalist and sometimes ethnocentric sentiments, but locating the problems in transnational political orders as well as economic ones. Though emphasizing different sources of problems, these movements call for greater national and societal controls defending local society. Overall, confidence in, and optimism about, transnational governance appears to decline, and a variety of national, religious, ethnic, and social solidarities seem to be on the rise.

However, so far there is no evidence of a corresponding demise of confidence in the value of higher education for individuals and societies. How higher education will link to a changing world order is unclear, in good part because it is too early to ascertain what a new anti-globalization order might look like. Most likely, oppositional elites will turn out to be highly educated, and will continue policies favoring mass higher education. But, sustained attacks on the university are certainly within the realm of future possibility, and would likely undermine many of the effects observed in this paper.

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Table 1: Panel regression models: The effect of secondary and tertiary enrollments on the expansion of professions, organization, and rationalization of the state. <sup>a</sup>

VARIABLES	Professional Associations <sup>b</sup>	Civil society Organizations <sup>c</sup>	Trans- parency <sup>c</sup>	Government Corruption <sup>d</sup>	Bureaucratic Efficiency <sup>e</sup>
Population (log)	0.68*** (0.033)	1.00*** (0.026)	1.59*** (0.090)	1.68** (0.564)	-2.02*** (0.541)
GDP p/cap (log)	0.16*** (0.018)	0.11*** (0.014)	0.04 (0.055)	-0.68*** (0.155)	1.26*** (0.172)
Democracy	0.00 (0.001)	0.01*** (0.001)	0.01*** (0.004)	-0.02 (0.023)	-0.00 (0.013)
Secondary Enrollment	0.34*** (0.054)	0.18*** (0.042)	0.24 (0.172)	-0.35 (0.241)	-0.04 (0.556)
Tertiary Enrollment	0.72*** (0.066)	0.57*** (0.052)	1.28*** (0.217)	-0.31 (0.246)	2.69*** (0.404)
Constant	-4.12*** (0.199)	-4.52*** (0.155)	-5.50*** (0.571)	0.65 (3.545)	-0.63 (3.117)
Observations	2,474	2,474	396	637	819
R-squared	0.680	0.794	0.837	0.106	0.189
Countries	141	141	116	43	123

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<10

<sup>a</sup> Standard errors in parentheses; all independent variables lagged one year.

<sup>b</sup> Source: Associations Unlimited (Gale 2014).

<sup>c</sup> Source: Drori et al. 2006.

<sup>d</sup> Source: Transparency International 2016.

<sup>e</sup> Source: World Development Indicators (World Bank 2014).



Table 2: The effect of secondary and tertiary enrollments on the global integration: world polity, world society, and the global economy. Panel regressions with fixed effects. <sup>a</sup>

VARIABLES	Treaty Ratification <sup>b</sup>	INGO Membership <sup>c</sup>	Env1 INGO Membership <sup>c</sup>	Women's INGO Membership <sup>c</sup>	Global Tourism <sup>d</sup>	Trade <sup>d</sup>	FDI Inflows <sup>d</sup>
Population (log)	11.46*** (0.227)	1.70*** (0.047)	0.92*** (0.030)	0.79*** (0.035)	0.08* (0.037)	2.41+ (1.407)	2.53*** (0.671)
GDP per capita (log)	0.56*** (0.140)	0.16*** (0.028)	0.10*** (0.018)	0.12*** (0.021)	0.09*** (0.012)	11.87*** (0.853)	0.67+ (0.388)
Democracy	0.24*** (0.010)	0.01** (0.002)	0.02*** (0.001)	0.00* (0.001)	0.00 (0.001)	0.32*** (0.060)	0.04 (0.027)
Secondary Enrol.	5.42*** (0.457)	0.69*** (0.093)	0.53*** (0.057)	-0.06 (0.066)	-0.13*** (0.026)	-2.30 (2.642)	-1.37 (1.235)
Tertiary Enrollment	20.64*** (0.513)	0.87*** (0.100)	2.28*** (0.061)	1.26*** (0.067)	0.15*** (0.024)	27.08*** (2.814)	4.47*** (1.185)
Constant	-76.88*** (1.392)	-7.66*** (0.292)	-6.69*** (0.182)	-5.56*** (0.213)	-1.33*** (0.238)	-75.61*** (8.442)	-22.05*** (4.216)
Observations	5,697	5,164	5,558	5,253	1,269	5,424	4,462
R-squared	0.821	0.585	0.729	0.443	0.217	0.249	0.028
Countries	145	144	146	144	103	144	145

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.10

<sup>a</sup> Standard errors in parentheses; all independent variables lagged one year.

<sup>b</sup> Source: Ecolex 2014; Normlex 2014; United Nations OHCR 2014.

<sup>c</sup> Source: Yearbook of International Association (UIA, various years)

<sup>d</sup> Source: World Development Indicators (World Bank 2014).

Table 3. Effects of secondary and tertiary enrollments on political mobilization and social change. Panel regression models with fixed effects.<sup>a</sup>

VARIABLES	Environmental groups <sup>b</sup>	Air pollution <sup>c</sup>	Forest area <sup>c</sup>	Political organizations <sup>b</sup>	Human rights <sup>d,e</sup>
Population (log)	0.25*** (0.043)	1.30*** (0.052)	-6.50*** (0.378)	0.96*** (0.032)	-0.60*** (0.116)
GDP per capita (log)	0.18*** (0.023)	0.69*** (0.031)	0.80*** (0.149)	0.14*** (0.018)	0.36*** (0.041)
Democracy	0.01** (0.002)	0.00 (0.002)	-0.05*** (0.012)	0.01*** (0.001)	0.04*** (0.003)
Secondary Enrollment	0.60*** (0.071)	-0.43*** (0.097)	-0.64 (0.436)	0.27*** (0.053)	-0.08 (0.128)
Tertiary Enrollment	0.90*** (0.087)	-3.62*** (0.118)	2.42*** (0.388)	0.59*** (0.065)	0.75*** (0.165)
Constant	-3.35*** (0.256)	-10.90*** (0.325)	66.64*** (2.042)	-5.97*** (0.192)	79.65*** (5.992)
Observations	2,491	4,149	2,775	2,491	3,981
R-squared	0.542	0.478	0.176	0.742	0.265
Countries	142	116	144	142	137

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.10

<sup>a</sup> Standard errors in parentheses

<sup>b</sup> Source: Associations Unlimited (Gale 2014).

<sup>c</sup> Source: World Development Indicators (World Bank 2014).

<sup>d</sup> Source: Gibney et al. 2015

<sup>e</sup> Includes additional controls for civil war, ethnic fractionalization, and year trend, following Cole (2013).

Table 4a: Effects of secondary and tertiary enrollments on GDP and relative size of economic sectors (as % of GDP), 1960-2010. 5-year pooled panel regression models with lagged dependent variable and fixed effects. <sup>a</sup>

Independent variables (5-yr lag)	GDP per Capita <sup>b</sup>	Service <sup>c</sup>	Industry <sup>c</sup>	Manu- facturing <sup>c,d</sup>	Agri- culture <sup>c</sup>
Investment	0.30*** (0.088)	-1.38 (2.322)	13.53*** (2.496)	1.94 (1.611)	-10.39*** (2.133)
Secondary Enrollment	0.26*** (0.071)	4.59** (1.469)	-0.62 (1.550)	0.13 (0.939)	-2.07 (1.364)
Tertiary Enrollment	0.25** (0.084)	7.04** (2.174)	-3.33 (2.238)	-3.26* (1.409)	-2.22 (1.837)
GDP per capita, log	0.81*** (0.020)				
Service		0.56*** (0.028)			
Industry			0.59*** (0.028)		
Manufacturing				0.56*** (0.029)	
Agriculture					0.68*** (0.023)
Constant	1.90*** (0.173)	20.25*** (1.345)	10.28*** (1.014)	6.33*** (0.597)	8.24*** (1.083)
Observations	1,317	981	984	837	988
R-squared	0.844	0.487	0.430	0.384	0.648
Countries	161	154	155	153	154

Standard errors in parentheses

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.10

<sup>a</sup> All independent variables lagged five years, including lagged dependent variable.

<sup>b</sup> Source: Penn World Table (World Bank 2014).

<sup>c</sup> Source: World Development Indicators (World Bank 2014).

<sup>d</sup> Note: The category “manufacturing” is a subset of the overall industry sector; mining, gas, electricity, water, and construction are excluded.

Table 4b: Effects of secondary and tertiary enrollments on GDP per capita and the absolute size of economic sectors (in inflation-adjusted dollars per capita, logged), 1960-2010. Five-year pooled panel regression models with lagged dependent variable and fixed effects.<sup>a</sup>

Independent variables (5-yr lag)	GDP per Capita <sup>b</sup>	Service <sup>c</sup>	Industry <sup>c</sup>	Manu- facturing <sup>c,d</sup>	Agri- culture <sup>c</sup>
Investment	0.30*** (0.088)	0.41*** (0.101)	0.25+ (0.126)	0.36** (0.133)	0.21** (0.079)
Secondary Enrollment	0.26*** (0.071)	0.12* (0.061)	0.07 (0.076)	0.06 (0.085)	0.02 (0.046)
Tertiary Enrollment	0.25** (0.084)	0.31*** (0.082)	0.25* (0.097)	0.16 (0.113)	0.15* (0.065)
GDP per capita, log	0.81*** (0.020)				
Service		0.74*** (0.023)			
Industry			0.71*** (0.023)		
Manufacturing				0.78*** (0.024)	
Agriculture					0.59*** (0.029)
Constant	1.90*** (0.173)	1.73*** (0.144)	1.82*** (0.128)	1.18*** (0.108)	2.15*** (0.154)
Observations	1,317	875	922	745	907
R-squared	0.844	0.761	0.685	0.771	0.401
Countries	161	142	147	136	143

Standard errors in parentheses

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, + p<0.10

<sup>a</sup> All independent variables lagged five years, including lagged dependent variable.

<sup>b</sup> Source: Penn World Table (World Bank 2014).

<sup>c</sup> Source: World Development Indicators (World Bank 2014).

<sup>d</sup> Note: The category “manufacturing” is a subset of the overall industry sector; mining, gas, electricity, water, and construction are excluded.

Appendix A: Descriptive statistics for variables used in analyses.

Variable	Obs	Mean	Std Dev	Min	Max
Professional Orgs (log)	2,521	2.91	1.74	0.00	7.20
Civil Society Orgs (log)	2,521	4.18	1.61	0.00	8.52
Transparency	400	5.91	0.64	4.80	7.44
Corruption	610	3.89	2.28	0.00	7.90
State Rationalization	698	0.07	2.03	-14.40	5.18
International Treaties	5,803	11.42	7.69	0.00	26.00
INGO membership	5,176	5.87	1.42	0.00	8.34
Env'l INGO membership	5,529	1.32	0.94	0.00	3.69
Women's INGO member	5,159	1.32	0.81	0.00	3.00
Tourists (outgoing)	1,220	0.27	0.28	0.00	1.09
Trade Openness	5,422	68.40	39.60	5.31	333.53
FDI	4,373	2.53	7.11	-161.24	172.72
Env'l Associations (log)	2,521	1.09	1.13	0.00	5.07
Air pollution (log)	4,203	4.82	2.10	-2.52	10.39
Forest Area	2,698	30.23	21.71	0.00	94.72
Political Orgs (log)	2,521	2.88	1.40	0.00	7.22
Human Rights (SD)	4,130	3.61	1.12	1.00	5.00
Real GDP p/cap (log)	5,965	10.36	2.03	4.63	16.41
Service Sector %	4,694	49.98	13.15	3.35	86.73
Industry %	4,723	29.88	11.66	1.88	86.74
Manufacturing %	4,130	15.38	7.65	0.16	45.28
Agriculture %	4,722	20.12	16.00	0.15	93.98
Service p/cap (log)	4,199	6.92	1.68	2.39	11.10
Industry p/cap (log)	4,427	6.35	1.75	2.11	10.13
Manuf. p/cap (log)	3,603	5.48	1.73	1.30	9.20
Agriculture p/cap (log)	4,345	5.35	0.70	3.26	7.22

Appendix B. Effects of tertiary enrollment on riots, anti-government demonstrations, revolutions, and assassinations.

VARIABLES	Riots	Anti-gov't Protest	Revolutions	Assassinations
Population (log)	0.04 (0.034)	0.18*** (0.037)	0.08*** (0.021)	0.01 (0.025)
GDP per capita (log)	-0.04* (0.021)	-0.02 (0.022)	-0.05*** (0.013)	-0.00 (0.015)
Democracy	0.00 (0.001)	-0.00** (0.002)	-0.00 (0.001)	0.00 (0.001)
Secondary Enrol.	0.04 (0.069)	0.32*** (0.075)	0.10* (0.043)	0.17*** (0.050)
Tertiary Enrollment	-0.50*** (0.080)	-0.54*** (0.087)	-0.04 (0.050)	-0.25*** (0.059)
Constant	0.45* (0.212)	-0.87*** (0.229)	0.06 (0.132)	-0.01 (0.154)
Observations	5,366	5,367	5,366	5,367
R-squared	0.021	0.022	0.006	0.006
Countries	143	143	143	143

Appendix C. Summary of tertiary enrollment effects across different panel model specifications.

Dependent Variable	Fixed effects (FE)	FE + lagged DV	FE + 10 year lag	FE + AR(1)	$\Delta$ + lagged DV	OLS PCSE
Professions	+	+	+	+	+	+
Civil society	+	+	+	+	+	+
Gov't transparency	+	n.s.	n.s.	+	n.s.	+
Gov't corruption	n.s.	n.s.	n.s.	-	n.s.	+
Bureau. efficiency	+	+	+	+	+	n.s.
Treaty ratification	+	+	+	+	+	+
INGOs	+	+	+	+	n.s.	+
Env'l INGOs	+	+	+	+	+	+
Women's INGOs	+	+	+	+	+	+
Tourism	+	n.s.	+	n.s.	+	+
Trade	+	+	+	+	+	n.s.
FDI	+	+	+	n.s.	+	+
Env'l Associations	+	+	+	n.s.	+	+
Air pollution	-	-	-	-	-	-
Forest area	+	+	+	n.s.	+	+
Political orgs	+	+	+	+	+	+
Human rights	+	n.s.	n.s.	+	-	+
GDP	+	+	+	+	+	+
GDP in service	+	+	+	+	+	+
GDP in industry	+	+	+	+	+	+
GDP in manuf.	+	n.s.	+	+	n.s.	+
GDP in agriculture	+	+	+	+	+	+

n.s. indicates non-significant coefficients.