INTERNATIONAL CENTER FOR PUBLIC POLICY

International Center for Public Policy

Working Paper 23-17

August 2023

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"Quick and Dirty" Deregulation and Expansion of National Higher Education: Be Careful of What You Ask For

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August 2023

Abstract

Increased access to higher education is a well-established stylized fact that many policies have driven, overlooking the implications for higher education's quality. During the 1990s, Peru embarked on a national-scale experiment that quickly and drastically deregulated new universities' entrance into the marketplace under two basic premises. The first was that the private sector is superior to the public sector in increasing access to higher education in a developing country with a budding institutional capacity. The second was that the market auto-regulates itself to provide an adequate quality of educational services. We document that the university supply almost doubled in a dozen years, mainly driven by for-profit institutions of higher education. The experiment could be hailed as an unqualified success as tens of thousands of new students, particularly from low-income sectors, could access a college education. Nevertheless, our straightforward evidence shows that this increased access paid a very high cost in the form of significant decreases in educational quality. Fifteen years after the reform, our findings indicate an increase in the quality dispersion across colleges measured by undergraduate students' outcomes.

Keywords: universities, education, quality, expansion, national, Peru

JEL Classification Codes: O10

* Chong: (corresponding author: achong6@gsu.edu): Georgia State University and Universidad del Pacifico; Lavado: Universidad del Pacifico; Yamada: Universidad del Pacifico. We are grateful to Michele Baggio, Arlette Beltrán, Juan Francisco Castro, Nelson Ramirez Roldán, Nikita Céspedes, Alan Sánchez, Luisa Zanforlin and to seminar participants at the Central Bank of Peru, Georgia State University, Universidad del Pacifico, Universidad Torcuato Di Tella, the World Bank and the Latin American and Caribbean Economic Association Meetings (LACEA) for comments and suggestions.

All data employed in our research are secondary administrative data, publicly available (www.minedu.gob.pe or contact corresponding author Chong). This research received no funding. We declare that none of the co-authors of the paper have no competing interests of any kind, including financial, personal, or others.

1. Introduction

There is broad consensus among researchers and policymakers that higher education has a positive role in socioeconomic outcomes, as abundant research shows. For instance, Cantoni and Yutchman (2014) provide historical evidence that medieval universities played a causal role in the commercial revolution. Aghion et al. (2009) find that increases in investments in college education affects growth and in particular, in the technological frontier. Similarly, Van Reenen and Valero (2019) show that doubling the number of universities is associated with over 4 percent higher gross domestic product per capita and show that universities matter beyond their effect on an individual's education, as democratic ideals may spillover from those who have direct contact with universities into their surrounding region.

Despite the widespread agreement that universities benefit societies, researchers have long debated whether a significant expansion of the educational system, particularly the higher education segment, may be warranted, given the likely trade-off that may occur regarding the quality of education. Will higher education expansion result in a decrease in educational quality? On the one hand, it has long been claimed that higher education enlargement will bring with it a lowering of student standards, a falling off in degree standards, and a change in what is taught and how it is taught. That expansion of university intake can occur only at the expense of university standards because an increase in numbers can be obtained only by accepting less able students. Some proponents accept this view and argue not about the decrease but about the extent to which standards need to fall due to expanding numbers (Little, 1961). On the other hand, one may argue that there is no fixed pool of ability of people with the capacity for higher education, but people get more and more intellectually stimulated every day, and as a result, the younger generations end up more intelligent than ever (Willets, 2017).

While not extensive, some theoretical literature in the social sciences explains some of the issues related to higher education above. According to the seminal work of Arrow (1973) and Stiglitz (1975), university education may be framed using screening theory by which a firm cannot observe the actual ability of potential employees. As such, it prefers to screen them based on their educational attainment as a proxy of ability. Thus, focusing on candidates with higher education degrees reduces the employer's risk of hiring someone with inadequate capacity to the cost that there may be a tendency to overinvest in higher education, as it serves as a signal. More recently, Beblavý et al. (2015) theorize that universities are incentivized to increase their student body beyond a level where they can keep their academic requirements high. These researchers present a theoretical model on how the expansion of higher education could be associated with several factors that indicate a decline in the quality of degrees and focus on how the expansion of higher education along with a decrease in university requirements might also be associated with a decline in studying time, grade inflation and a decrease in wages, which extends Stiglitz (1975). More specifically, the universities are modeled as organizations in which managers are interested in expanding their institutions; college academic requirements decrease as a consequence of universities setting requirements to maximize the pool of students, and students are better off if they get accepted to a university with a high rank and employers award a higher wage to those with a high grade. Under these circumstances, the grade will not necessarily be a mechanism to induce weaker students to study and catch up with more able students. As a result, quality suffers.

In the context of the current debate described above, in this paper, we study whether a drastic expansion in higher education may either lower standards and quality or leave them untouched. In order to do this, we exploited a change in the legislation in Peru in 1997 that

drastically deregulated the higher education market and allowed a drastic and national-scale university supply expansion. This dramatic expansion was done at the national level and essentially allowed the functioning of not-for-profit and for-profit educational organizations regulated through a set of flexible rules with the implicit aim of increasing private investment in schools. While this was consistent with the economic philosophy of the government at the time, the flexible legislative changes that allowed for more significant deregulation in the higher education market were pursued haphazardly under the premise that the market would auto-regulate itself and that, at the extreme, further legislative adjustments may be pursued later. As such, the new higher education system lacked explicit quality standards or accreditation procedures. Instead, urgency to pursue the reforms was prioritized.

In this research, we compare the entire universe of the university system in Peru before and after the drastic higher education legislative reforms by constructing a measure of university quality made from six specific indicators in order to gauge the changes in educational quality due to this "quick and dirty" deregulation process pursued in the country. While our findings are somewhat predictable, as drastic deregulation shows that education quality suffered, and we believe that the policy lessons of this real-world experiment are particularly valuable given the sheer size of the reform and the fact that this type of policy change has been very rarely documented. We conclude that minimal monitoring tools would have gone a long way to avoiding the drastic drop in quality in universities in the country after the reform. Worse yet, the reasoning applied by policymakers at the time, one of "self-regulation," was, unsurprisingly, ineffective as the government simply ignored the apparent conflict of interest of such a mechanism.

The paper is organized as follows. Section 2 describes the legislative changes that deregulated the higher education market in some detail. Section 3 presents our data and the methodology of analysis. Section 4 presents our results. Finally, in Section 5 we summarize and conclude.

2. Deregulation of Higher Education

As part of the reforms that the Peruvian government pursued during the 1990s, it introduced a new legal framework to regulate the market entry of higher education institutions in January 1995 with the creation of the National Council for the Authorization for Operation of Universities (CONAFU). This autonomous agency was commissioned to assess and issue legal resolutions authorizing or disapproving projects and operating license applications for new universities nationwide. In other words, its function was to authorize universities' creation, merging, and cessation nationwide. Before establishing this organization, new universities could only be created or ceased to exist by laws that had to be approved by the Ministry of Education and by a specific Committee in Congress before undergoing full voting for approval in the latter. This legislative procedure was described by a specific regulation from 1983. According to it, those entities interested in creating a new university had first to demonstrate the need for its creation, the availability of qualified faculty, and administrative capability. With the creation of CONAFU, the authorization to create new universities was changed and became dependent on the approval of the members of this organization only.

The critical piece of legislation that allowed for a full-scale deregulation process in higher education is directly related to the enactment of the so-called “Law to Promote Investment in

Education" (LPIE), which occurred in January 1997.[1] A major amendment to the previous legislation was that it authorized private organizations to promote, conduct, and manage for-profit services at the higher education level. According to this law, any private entity was allowed to create an institution of higher learning and gave discretionary power on how it would be managed, including its pedagogical processes, curricula, syllabus, course content as well as the length of the programs of study along with a host of other elements related to higher education as long as the institution met specific minimum requirements set by the Ministry of Education. This new law replaced the previous legislation that established that private universities could only be created by a legal entity governed by private law and for non-profit purposes, only. In the previous legislation, any annual positive balance resulting from its operations could only be invested on behalf of the institution of higher education or given to students in the form of scholarships. Any remaining funds were not to be distributed to shareholders or board members and could not be used by them directly or indirectly in any way. In contrast, the LPIE legislation allowed the distribution of any positive annual balance among the investors of any particular institution of higher education.

The purpose of LPIE legislation was dual. First, the law sought to quickly expand access to higher education in the context of rapid privatization of most industries in the economy. By doing so, the logic was to introduce competition among universities, old and new, and let the market dictate what specific institutions would survive and those that would die. Whereas plans to set up a specific Superintendency of University Education (SUNEDU) were always in the cards, the rapid approval and enactment of the new LPIE legislation preceded its creation, set up, and establishment of bylaws, which meant that by all practical purposes policymakers viewed

[1] Legislative Decree No. 882

higher education as an industry that would employ market-based systems to autoregulate itself. Good institutions were expected to survive, and bad ones would cease to exist (Balarin, 2015) .[2] This is highlighted by the fact that the regulatory entity that existed prior to the creation of SUNEDU was the National University Presidents Association (ANR), which raised apparent conflict of interest issues. The political pressure to quickly enact new legislation to allow for the creation of new universities was palpable. Along with widespread protests because of the lack of access to higher education, there was a widespread belief that the only way for people to move upwards in both the economic and social ladder was to acquire a university education (Balarín, 2015). As such, higher education has long been seen in the country not only as means to obtain better and higher paying jobs but also as a reputational signal that provides intellectual credibility to those with degrees. This is particularly true in non-urban areas and the Andean region (Castro and Yamada, 2013; Cuenca, 2015).

As a result of the new legislative regime, numerous entry barriers to higher education institutions were significantly and drastically reduced, and the number of higher education ventures eligible to be universities increased rather quickly, as expected. A dramatic period of expansion of universities began after the new law was enacted in 1997. In the span of ten years, from 1997 to 2007, the number of higher education institutions went from 61 to 93. During this period, the number of universities grew by more than one-third, directly attributed to the new legislation. This dramatic growth in university institutions in the country is shown in Figure 1. As a consequence of the new legislation, the number of applicants and students enrolled in the national university system showed a dramatic positive trend. The average annual higher

[2] While the LPIE legislation was enacted in 1996, the National Superintendency of University Education (SUNEDU) was created in 2014, only. It was tasked with the overall supervision of higher education policies in the country. This independent organization was preceded by the National Association of University Presidents (ANR), an organization composed by the Presidents of the universities.

education enrollment growth went from 1.2 percent before the new legislation was enacted in 1997 to 6.5 percent per year after it became effective. However, it should be mentioned that the deregulation policy was not prompted by higher demand for higher education or even an economic boom, as it is clear that high school enrollment rates remained not only flat but even tended to show a slight decline during the period studied, as data from the Ministry of Education of Peru (2022) shows.[3]

3. Data and Methodology

Whereas an increase in both the number of universities created as well as student enrollment was not only expected but desired, the Peruvian government enacted the legislative reforms described above under the assumption that as long as minimal quality standards were considered, the higher education market would self-regulate via changes in demand and supply so that high-quality institutions would remain in the market. Low-quality ones would end up leaving the market. Even though measuring and monitoring the quality of higher education institutions became a critical factor in gauging policy effectiveness, the government did not use any metric to monitor or assess the evolution of educational quality in universities. No official measure was even defined, even though the higher education institutions were supposed to maintain this "minimal level of quality".[4]

As mentioned in the Introduction, in this research, we assess the quality of universities. In particular, we compare the quality of higher education before and after the LPIE legislation was

[3] Whereas the number of students enrolled in high school remained flat at around 1.4 million students between 1998 and 2002, it increased to 1.7 million and stayed at this level during the period 2003 to 2010. In 2012 the enrollment rate in high school began showing a decreasing of around 1.5 million. In addition, the fact that the economy was growing at significant positive rates further disincentivized high school students to pursue higher education.

[4] Interestingly, the term "minimal level of quality" was not defined either.

enacted in 1997. In order to do this, we take advantage of the available two data rounds of the National University Census (CENAUN) that were collected in 1996 and 2010 by the National Institute of Statistics and Informatics (INEI). These data contain detailed information on university students, faculty, and the administrative facilities of the country's higher education institutions. Among others, the data include information on living conditions, academic achievement, financial constraints, and research activities of the universities. Students and faculty directly responded to the questionnaires. In addition, the census data also include inventories of the assets of each university.

We assess university duality by comparing the university census data before and after the enactment of the new higher education law, its precise enactment date, and each university's foundation dates in the national territory. In particular, we create a vector of six quality indicators at the university level: (i) the ratio of faculty per one hundred undergraduate students, (ii) the share of students that rate their corresponding university education as very good or excellent, (iii) the share of faculty that produced books up to two years prior to when the census was done, (iv) the academic publication rating, as indexed by Scopus, (v) the share of tenure-track faculty that gave lectures at academic events and (vi) the ratio of peer-reviewed publications per one-hundred faculty. We create an "overall" quality indicator that sums up each category's scores based on these indices. The higher our overall indicator, the higher the quality of the university.

In addition, we also assess the educational performance of university students in the country with respect to the quality of the corresponding institution attended. We take advantage of the fact that we have access to the entire universe of university students in the country using census data, which makes our findings relatively comprehensive. We employ two groups of

university students using data from two censuses, one done in 1996 and the other in 2010. In the first group, students are exposed to universities that existed before enacting the new deregulatory law. Finally, concerning the second group, the students captured by the 2010 census are those exposed to universities post-law enactment. By using both university censuses, we try to capture the short-run and the longer-run impacts of the legislative changes enacted in 1997.

It should be emphasized that according to the Census data mentioned above, 45 new universities were created between 1995 and 2010, of which 37 were private institutions and eight public. This is a relatively large number of new universities as the total number of institutions of higher education at the national level reached only 100. By 2010, 45 percent of the total number of universities in Peru were created after deregulation. This dramatic increase in institutions of higher education in such a short period immediately raises the issue of whether the national system of higher education was prepared to support such a substantial increase not only in terms of physical infrastructure but, more importantly, in terms of quality of the human capital both in terms of supply of instructors as well as in terms of the influx of new students that decide to study in these new institutions. Furthermore, it is unclear what type of spillover effects may occur in the already existing institutions of higher education due to this dramatic entrance of new universities in such a short period.

4. Findings

As mentioned above, we assess whether the overall university quality after drastic deregulation changes higher education quality when measured at both the university and student levels. Table 1 shows our results at the university level when using census data for both 1996 and 2010. When using our "short run" measure, namely, the before-and-after comparison using our

1996 census data, we find that our overall quality measure drops from 118.5 to 108. More importantly, this drop is also reflected in every single quality indicator considered. For example, the ratio of teachers per student went from 14 before deregulation to 11 soon after the new law was enacted. The share of students that rate their college education as 'good' or 'excellent' drops from 24.6 to 16.7.

Furthermore, the percentage of professors that published academic research goes from 5.5 to 0.1. In contrast, the quality of academic papers published in academic journals drops from 8.5 to 7.4, and the ratio of papers published in journals per 100 teachers goes from 6 to nearly zero. Even though all these point estimates coincide that deregulation, which brought about a large influx of new universities, appears to be linked to a drop in the quality of university education in Peru in the short run, it is also true that the change is not statistically significant at conventional measures in most measures and only in three out of the six measures available namely, the share of professors who made scientific presentations, the quality ratings of their publications and the ratio of papers published in journals per 100 teachers.

When we use our "long term" measure, that is, the 2010 national census instead of the 1996 national census as our cut-off before-and-after measure, we find that, as expected, the drop in all the quality indices mentioned above further drop and that now four out of the six measures are statistically significant at conventional levels. More importantly, our overall quality index change is now also statistically significant. In particular, our overall quality measure goes from 88.4 when measured before the 2010 Census to 74.8 when measured afterward. This drop is statistically significant at five percent. With respect to the individual measures, we find a similar pattern. Using our "long run" measure, we find that the ratio of teachers per student goes from 2.7 before 2010 to 1.9 afterward. The share of students that rate their college education as 'good'

or ‘excellent’ drops from 12 to 10. The percentage of professors that published academic research goes from 5.0 to 0.1, the quality of academic papers published in academic journals drops from 10.7 to 7.8, and the ratio of papers published in journals per 100 teachers goes from 3.5 to 0.3. The individual quality measures statistically significant at conventional levels are the ratio of teachers per one hundred students, the share of teachers with research published, the quality rating of academic publications, and the ratio of papers published in journals per 100 teachers.

Furthermore, what is particularly remarkable is that the change in the overall quality rating and the ratings of all the individual measures are statistically significant at conventional levels. This can be observed in the last column in Table 1. That is, while the “short run” impact of deregulation brings about a drop in higher education quality due to the influx of new universities, this issue became far more pronounced in the “longer term”, as illustrated by the fact that the more measures became statistically significant including the comparison in measures between the “short term” and the “long term”.

Related to the above, Table 2 explores the basic patterns of university creation before and after deregulation. We define a simple cut-off point of quality based on the median overall quality index described previously and categorized universities as either of ‘low’ or ‘high’ quality depending on where they fall according to our cut-off point. While this is a straightforward approach, it has the advantage of illustrating the extent to which deregulation may have impacted university quality in the short term and the long term in a very transparent and straightforward manner. Table 2 shows the distribution of universities according to our quality categorization using the 1996 and 2010 Census. This allows for an implicit, but

admittedly, rudimentary pseudo-trend comparison, as we can observe behavior at two points in time, in the “short term” and in the “long term”, similar to what we did previously.

Using the National University Census data for 1996, we are able to categorize just one-third of the total number of institutions as being of high quality. Unsurprisingly, public universities rate lower than private ones in terms of quality when using our overall index described above. In fact, out of 29 public universities, 21 are rated as low-quality ones. That is, 72 percent of the total number of public universities were already rated as being of low quality before the new legislation was enacted. The opposite is true in the case of private universities, where 60 percent of the total number of institutions are rated as being of high quality.

When using the 2010 Census, which does capture the legislative deregulation that allowed for more accessible entrance of new institutions of higher education to the marketplace, one may claim that there is no discernable difference in the overall quality of universities as compared to the period prior to deregulation, as shown when using the 1996 Census. This is illustrated by the fact that when using the 2010 Census, around 71 percent of the total number of universities are rated as being of low quality, which is not too different from the share of universities rated as low quality when using the 1996 Census, 67 percent. Therefore, does it mean that Peru’s drastic university expansion did not significantly affect the quality of higher education?

Interestingly, while there appear to be no drastic differences in the overall quality of universities regardless of what year of Census data we employ, there are very dramatic differences in the distribution of universities quality-wise depending on whether the institutions are private or public, as Table 2 suggests that there appears to have occurred short term and long-term quality adjustments along these lines. While new universities were created in both the

public and private sector in the period between our census, 86 percent of new entrants were from not-for-profit private schools, of which we classify two-thirds as being of low quality when using our measurements above. As dismal as this already looks, the case of new public universities during this period is even worse. All the new entrants, eight in total, are classified as low quality when using our standards. So, while in absolute terms, it is clear that during this period, most of the new low-quality universities were private, distributionally, the influx of new low-quality public universities skews the corresponding share of private/public schools in such a way that while 65 percent of private universities end up classified as low quality in 2010, a slight increase from the 61 percent before deregulation, a whopping 83 percent of new public universities are rated as low quality, according to our quality measures, up from 72 percent prior to deregulation. In short, whereas the overall quality of the higher education system might be seen as basically unchanged due to deregulation, this is not the case in absolute terms, as the vast majority of private and public new universities are low-quality institutions. Worse yet, all the new public institutions that entered the market as a result of deregulation are low-quality ones, which are institutions that cater to those with fewer means, as public universities do not charge tuition. As a result, this further reinforces polarization between wealthier groups of the society that can afford relatively better universities and the poorer ones, who are unable to do so and ends up going against the original policy goal of providing higher education to all as a means to achieve more equality in the society (Leon and Sugimaru, 2013).

Our findings on the supply side are consistent with those on the demand side, namely, the students that attended university between 1996 and 2010. These findings are shown in Table 3. As before, we use the 1996 national census and compare these data with the 2010 census. In particular, we organize the demand side on three primary groups: (i) individual and family

characteristics, (ii) academic characteristics, and (iii) labor characteristics. Again, most if not all of the categories, as well as the specific characteristic within each of them, show a very consistent pattern: while the dramatic and quick increase in university supply was covered by the existing pent-up demand of students seeking to enter university education, this occurred to the detriment of the educational quality in most, if not all, relevant categories.

From the perspective of the first group, individual and family characteristics, we find that post-secondary education is restricted by limited financial resources to make educational investments and does not change significantly in the short and long run. This is reflected by the fact that more than seventy percent of public high-school students access low-quality universities, regardless of whether we are measuring the short term (1996 census) or the long term (2010 census), as shown in Table 3. Unfortunately, it appears that the expansion in the university supply is not reflected in increased access to higher quality universities for public high-school students, which, it may be claimed, ends up further polarizing the educational differences between the haves and have-nots, which in a way contradicts the basic premise of the government that expanding higher education will provide access and higher social mobility to those that previously were not able to enter such institutions. This is further observed in the fact that when using the 2010 census, there is a clear higher-education quality division depending on household income. The higher the household income, the higher the difference between those that can access high-quality university education. Even though the absolute number difference becomes more noticeable the higher the household income category, the difference between high quality and low quality is statistically significant even in each household income category.

With respect to the second demand group, academic characteristics, we find a similar pattern in most categories considered. For instance, students who attend high-quality institutions

are always fluent in a second language. This did not change in the fourteen years between the first and second National Census. In 1996, 49 percent of students that attended high-quality institutions of higher education were fluent in a second language, while only 34 percent of those that attended low-quality institutions were so. In 2010 this difference amplified as the corresponding shares were 55 percent and 41 percent, respectively. These differences are statistically significant regardless of the year of the Census. In this same group of categories, we also observe that regardless of the year of the Census, high-quality institutions are typically linked with the idea that they have higher prestige and higher potential economic returns. This is typical of highly fragmented institutions in developing countries and likely endogenous, as students from higher economic segments tend to group themselves in institutions of higher education that cater to them and are very well connected to segments of the labor sector that cater to these universities. If anything, our Census data shows that this perception of prestige has become more entrenched between 1996 and 2010. This latter result is further highlighted by the fact that proximity to home is particularly relevant to low-quality institutions: students who attend high-quality universities care about the perception of such schools, while students who attend low-quality universities tend to care more about practical matters, such as distance to home. In fact, 54 percent of students that attend low-quality institutions care about home proximity compared to 22 percent of students attending high-quality institutions. This difference has become a bit less critical in the fourteen years between both Census, although statistical significance at conventional levels remains. Other essential characteristics related to academics further reinforce a stark difference between low-quality institutions and high-quality institutions. This is the case of how students rate their learning. In 1996 while 80 percent of students from high-quality institutions indicated that their education was good or excellent, only 63 percent of

low-quality institutions did. More importantly, in 2014, students from both groups did implicitly recognize a dramatic drop in their educational quality, 41 percent of students from high-quality institutions now rate their learning as good or excellent.

Interestingly, in 2014, 51 percent of students from low-quality institutions rated their schools as providing good or excellent education. This year, a larger share of students from low-quality institutions rated their schools as good or excellent than students from high-quality institutions, which is likely related to their initial expectations. However, the corresponding percentages related to the quality of faculty and university perspectives follow a similar pattern to all the other characteristics mentioned above.[5]

Finally, with respect to the third group of variables, labor characteristics, we find a similar pattern. Most telling is that those students attending high-quality universities end up in white-collar jobs. For instance, in 1996, 40 percent of students from high-quality institutions ended up in such jobs, compared to 30 percent from low-quality universities. This, even though there were no differences in access to internships. Fourteen years later, in 2010, 83 percent of students from high-quality universities got white-collar jobs, and only 75 percent of low-quality universities did. This is also reflected in terms of earnings. Those from high-quality institutions tend to earn more than students from low-quality universities. This difference is statistically significant at conventional levels and is reflected in both Census. In short, access to high-quality universities does matter regarding labor perspectives.

[5] These two variables are only available for the 2014 Census. Also, it is important to mention that some categories shown in Table 3, including financial aid, dropouts and assistance from private tutors show a somewhat less consistent pattern, but overall do not contradict the findings described on the text.

5. Final Remarks

During the 1990s, Peru embarked on a national-scale experiment that very quickly and drastically deregulated new universities' entrance into the marketplace under two basic premises. The first one was that the private sector is superior to the public sector, and the second was that the market ends up auto-regulating itself. Unsurprisingly, the university supply almost doubled in a dozen years, mainly driven by for-profit institutions of higher learning. While initially hailed as an unqualified success by politicians of different stripes, as tens of thousands of new students could access higher education institutions, our straightforward evidence shows that students paid a very high price in the form of significant decreases in educational quality across the board. Today, this reality is difficult not to accept.

Our findings are based on higher education Census data 14 years apart. Thus, while using the universe of data, it may still be claimed that time-varying factors may be driving our findings. However, it is reasonable to believe this does not appear to be the case. Between 1996 and 2010, the Peruvian economy was booming, yielding high growth rates, lower poverty rates, and a dramatic reduction in income inequality. Still, even in this context, we find a significant drop in education quality during this period. The bluntness of our findings is quite remarkable and likely undeniably true and today tends to be accepted by policymakers. The challenge for the country is how to reverse this drop in educational quality, especially now that there are deeply entrenched vested interests that make it particularly difficult to pursue structural changes in the sector.

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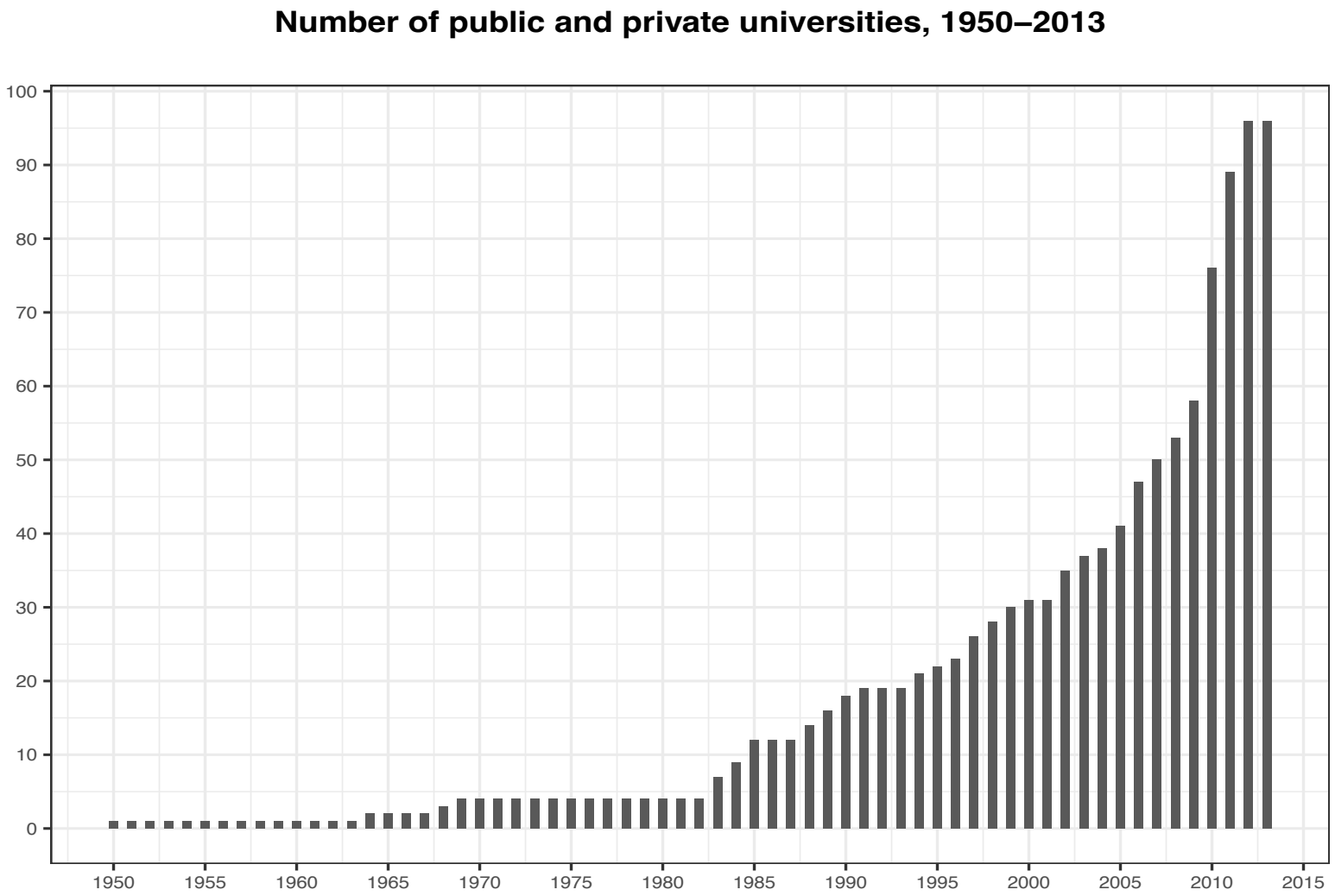
Figure 1



Note: The figure presents the number of public and private universities in continuous operation starting in 1950s. Universities created and closed within this period are excluded.

Table 1. University Quality Indicators

Date indicator measurement	University Census 1996					University Census 2010					2010/ 1996
Universities by creation date regarding market deregulation	Before	After	s.e.	Total Mean	Total s.d.	Before	After	s.e.	Total Mean	Total s.d.	s.e.
Ratio of teachers per one hundred (100) undergraduate students [(1)]	14.0	11.0	0.02	13.6	4.7	2.7	1.9	1.3**	2.32	2.2	0.7**
Share of students evaluating good or excellent level of university education [(2)]	24.6	16.7	6.3	23.8	8.0	12.0	10.0	3.5	11.1	8.1	3.0**
Share of teachers with research published in books for two years prior to survey	5.5	0.1	2.0	4.9	15.5	5.0	0.1	0.4*	2.8	11.9	0.7***
Share of Professors who made presentations at scientific meetings and / or academics [(3)]	61.1	71.5	4.2*	62.2	18.4	57.4	51.8	1.6	54.9	16.8	1.3***
Rating of academic publications indexed by Scopus	8.5	7.4	2.3**	7.5	3.0	10.7	7.8	2.1**	9.1	6.2	2.4*
Ratio of papers published in journals per 100 teachers	6.0	0.2	2.9*	5.4	19.5	3.5	0.3	1.4**	2.1	7.9	2.7*
Overall Quality Indicator	118.5	108.0	10.2	117	48	88.4	74.8	6.7**	82	36	7.3***
Number of universities	51	6	.	57		55	45	.	100		.

Notes: (1) Faculty teachers who are hired permanently by universities. This excludes extraordinary or honor teachers. (2) The CENAUN 1996 refers to the prospects of a college education, while the Census of 2010 refers to university education received. (3) The 1996 CENAUN refers to assistance to academic events in general, while the CENAUN 2010 refers to attend national and international events. * 10%, ** 5%, *** 1% Source: National Census 1996 University, 2010.

Table 2. Distribution of Universities According to Quality and Type

	National University Census 1996				National University Census 2010			
	Private	Public	Total	Percentage	Private	Public	Total	Percentage
Low	17	21	38	67	42	29	71	71
High	11	8	19	33	23	6	29	29
Total	28	29	57	100	65	35	100	100

Source: National University Census, 1996 and 2010

Table 3. Student Quality Indicators in Universities
(percentage)

	1996			2010		
	Low quality	High quality	Standard Error	Low quality	High quality	Standard Error
Individual and family characteristics						
Student from public high schools	76.4	43.4	6.7***	73.2	51.8	7.9***
Household income below 500 PEN				27.8	15.5	4.4***
Household income from 501 to 1000 PEN				32.6	25.8	3.6*
Household income greater than 1500 PEN				22.2	41	7.5**
Academic characteristics						
Fluency in a second language	33.5	49.2	5.3***	41.2	54.5	6.7*
Prestige or economic perspectives	35.7	67.5	4.9***	58.2	71.9	5.6**
Career or proximity to home	54.3	21.5	4.4***	37.9	23.0	5.4***
University training: good or excellent	66.8	84.3	3.1***	46.6	67.9	3.8***
Qualification of faculty teachers: good or excellent				58.7	67.1	4.2*
Future university perspectives: good or excellent				54.2	47.6	2.9**
No financial aid	25.0	16.8	2.8**	68.9	73.7	4.3
Financial aid	7.6	14.2	3.2**	10.1	11.6	2.7
Dropouts	23.5	18.4	2.5**	11.2	15.2	2.3*
Non- Private tutor assisted	41.4	27.1	3***	49.3	59.1	5.3**
Assisted by Private Tutor	63.8	79.8	3.2***	50.7	40.9	5.3***
Labor characteristics						
Seniors enrolled in internships	15.1	13.7	2.3	22.2	20.5	5.3
White Collar occupations	29.6	40.1	4.3*	75.4	82.7	2.4***
Blue Collar occupations	19.2	20.0	2.6	19.8	14.4	2.1***
Worked less than 40 hours per week	79.4	88.0	3.0**	65.6	67	4.3*
Earns less than 500 PEN	83.8	79.0	5.0*			
Earns between 501 and 1000 PEN	6.5	9.8	3.3**	48.5	37.7	2.32*
Undergraduates	228,728	118,632		129,521	26,671	

Note: Not all categories are available for both census. Source: National Assembly of University Presidents