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COMPARATIVE ANALYSIS OF HIGHER EDUCATION
PROCESSES IN EGYPT, JORDAN AND TUNISIA:
AN EXAMINATION OF PEDAGOGY, ACCOUNTABILITY
AND PERCEPTIONS OF QUALITY

Ragui Assaad and Caroline Krafft

Working Paper No. 1069

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Abstract

In this paper, we present a comparison of several dimensions of higher education processes linked to educational quality across different types of higher education institutions in three MENA countries: Egypt, Jordan and Tunisia. While an important comparison is across public and private institutions, we also distinguish across selective and non-selective institutions and by field of study. To keep the comparison tractable, we restrict our analysis to two broad fields of study, namely information technology and business/commercial studies. The rationale for selecting these fields is that they are the ones where private sector institutions are likely to be more prevalent in all three countries, allowing for meaningful comparisons by sector of ownership. The analysis is based on three similar surveys of higher education graduates from these two fields conducted by ERF with local partners in all three countries over the course of 2012 to 2015.

JEL Classifications: I23, I21, H4, H11

Keywords: Higher education, Private education, Incentives, Governance, Egypt, Jordan, Tunisia, Middle East and North Africa

ملخص

في هذه الورقة، نقدم مقارنة بين عدة أبعاد لعمليات التعليم العالي والتي ترتبط بجودة التعليم عبر أنواع مختلفة من مؤسسات التعليم العالي في ثلاثة بلدان في المنطقة وهي: مصر والأردن وتونس. وفي حين أن المقارنة المهمة هي عبر المؤسسات العامة والخاصة، نقوم أيضا بالتمييز بين المؤسسات الانتقائية وغير الانتقائية حسب مجال الدراسة. وللحفاظ على متابعة المقارنة، نحصر تحليلنا لاثنتين من المجالات الواسعة للدراسة، وهي تكنولوجيا المعلومات والأعمال / الدراسات التجارية. الأساس المنطقي لاختيار هذه المجالات هو أنهم من المحتمل أن يكونوا الأكثر انتشارا في البلدان الثلاثة، مما يسمح بإجراء مقارنات ذات معنى بين مؤسسات القطاع الخاص. ويستند هذا التحليل على ثلاث دراسات مماثلة من خريجي التعليم العالي من هذين المجالين أجراه منتدى البحوث الاقتصادية مع الشركاء المحليين في البلدان الثلاثة على مدار الثلاثة أعوام من 2012-2015.

1. Introduction

Higher education systems in the Middle East and North Africa are among the fastest growing in the world. According to the Barro-Lee educational attainment dataset, six MENA countries (Yemen, Algeria, Libya, Iran, Tunisia and Morocco) are among the top twenty countries in the world in terms of the growth in higher educational attainment from 1990 to 2010 (Barro and Lee 2013).¹ Higher education systems in MENA are expanding rapidly in part to respond to the growing youth population associated with the youth bulge phenomenon (Assaad and Roudi-Fahimi 2010), but also to respond to growing demand for higher education in the region. This rapid expansion has meant that a great deal of effort and resources are focused on increasing enrollment, often at the expense of the quality of education being delivered (OECD/world Bank 2010). Many countries of the region have expanded the role of the private sector to help meet this growing demand in a context characterized by scarce public resources (El-Araby 2010, Fahim and Sami 2010).

The working hypothesis of the research project of which this paper is a part is that incentives matter for the performance of higher education institutions. If the incentives of agents at different levels of the institutional hierarchy are aligned with better institutional performance, this will lead to better performance even if the level of resource inputs is the same (World Bank 2008). For incentives to work, institutions must have a degree of autonomy in decision-making and must have mechanism to incentivize their agents for better performance. Private institutions, which must compete in the market place for tuition revenues have a built-in incentive to respond to market demand. Whether or not this results in better performance depends on the nature of this demand and whether the primary clients, students and their families, actually want a high quality education.² Public institutions could have incentives for better performance if they have sufficient decision-making autonomy and are held accountable for their results, or if they derive substantial revenues from tuition.

In this paper we present a comparison of several dimensions of higher education processes linked to educational quality across different types of higher education institutions in three MENA countries: Egypt, Jordan and Tunisia. While an important comparison is across public and private institutions, we also distinguish across selective and non-selective institutions and by field of study. To keep the comparison tractable, we restrict our analysis to two broad fields of study, namely information technology and business/commercial studies. The rationale for selecting these fields is that they are the ones where private sector institutions are likely to be more prevalent in all three countries, allowing for meaningful comparisons by sector of ownership. The analysis is based on three similar surveys of higher education graduates from these two fields conducted by ERF with local partners in all three countries over the course of 2012 to 2015.

The main question that this paper is attempting to address is how public/private ownership, the extent of selectivity of institutions and the field of study affect educational outcomes such as pedagogical processes, accountability practices and perceptions of quality among students and graduates. This paper builds on three previous papers that examined the institutional and governance structures of the higher education systems in all three countries (Barsoum 2014, Barsoum and Mryyan 2015, Boughzala, Ghazouani and Ben Hafaiedh 2016). It complements the mostly qualitative analyses of these papers with a comparative quantitative analysis of the results of the three Higher Education Graduates Surveys conducted by ERF. It utilizes a similar

¹ Calculation based on the growth in the percentage reaching higher education for those 25 and older in the 146 countries included in the dataset.

² Barsoum (2016) argues that in the Egyptian context students are looking for an easy way to obtain a desired certificate rather than for the high quality skills that the certificate imparts. See also Salehi-Isfahani's (2012) discussion of the "credentialist equilibrium."

methodology as Assaad, Badawy and Krafft (2016) but extends the analysis to the Tunisian case.

2. Data

The three Higher Education Graduates Surveys (HEGS) used a similar design to sample graduates from public and private higher education institutions in both commerce/business and information technology. The eligibility criteria for inclusion in the Higher Education Graduates' Surveys were that the individual be between the ages of 25 and 40, lives in an urban area, has bachelor level degree in either commerce/business or information technology. In Egypt and Jordan, the sample was further restricted to those who had ever worked. In Egypt, the source of the sample was respondents to one quarterly round of the Labor Force Survey (LFS). The LFS is a nationally representative survey carried out on a regular basis by the Central Agency for Public Mobilization and Statistics (CAPMAS) that collects information on educational attainment, specialization, and labor market status, among other variables. In Jordan, the sample was drawn from one round each of the Employment and Unemployment Survey and the Household Income and Expenditure Survey, both of which are nationally representative surveys carried out by the Jordanian Department of Statistics (DoS). Return visits were made to individuals in these samples that met the eligibility criteria and a detailed questionnaire on their family backgrounds, educational experiences and labor market experiences was administered to them.

The Tunisian survey, in contrast, did not sample from a nationally representative survey. Instead, the sample was extracted from individuals who had registered with the national employment agency (Agence Nationale de l'Emploi et du Travail Indépendant, ANETI), a database of graduates interested in employment services. Thus, the sample Tunisia potentially suffers from selection bias and could be skewed towards those needing assistance in the labor market. Given the rapid growth in higher education and high unemployment rates of educated Tunisian youth, this is likely to encompass a substantial share of graduates (Assaad, Ghazouani, & Krafft, 2016). However, those who successfully transitioned without assistance will, of course, be absent from the sample, which may bias results. From the ANETI sample of 15,500 addresses throughout Tunisia's 24 governorates, an urban sample of 2500 individuals was selected. Many individuals could not ultimately be found, yielding a sample of 1,223 graduates. Thus, the sample we analyze in this paper consists of 1,710 graduates from Egypt who attended 147 distinct institutional units, 1,539 graduates from Jordan who attended 47 institutional units, and 1,223 graduates from Tunisia who attended 162 institutional units. An institutional unit is made up of the combination of a higher education institution and a field of specialization, such as commerce at Cairo University or IT at the University of Jordan. It is thus possible for the same higher education institution to be represented by two institutional units if it has both commerce/business and IT faculties.

3. Outcome Measurement³

The outcomes we examine in this study, pedagogical processes, accountability practices and perceptions of quality, are fairly complex, multi-dimensional concepts that can be captured in a variety of ways. To measure pedagogical processes we rely on a question in the three surveys that asks respondents to describe the extent to which the following teaching methods were used in their bachelor-level education at the higher education institutions they attended:

- Lectures
- Group projects
- Participation in research projects
- Applied knowledge

³ This section is primarily based on Assaad, Badawy and Krafft (2016)

- Theories
- Exclusive use of materials authored by professor
- Education based on problem solving and case studies
- Analytical assignments
- Oral presentations by students
- Multiple choice questions
- Writing topics
- Computer-aided education

The five point scale respondents were asked to use was (1) never, (2) rarely, (3) sometimes, (4) often, (5) to a very high degree. A mean of this scale was calculated for each teaching method in each institutional unit based in averaging the responses of students who attended this institutional unit. The twelve teaching methods were reduced to a single pedagogy factor using factor analysis, which is a data-reduction technique that uses the correlation between different variables that are all related to some underlying construct to create a normalized continuous factor that is a weighted sum of the original variables (Harman 1976).⁴

To measure institutional accountability practices, respondents were asked several questions about the extent to which their institutions elicited their views on various aspects of their education. These questions are:

- Did the university provide students with the opportunity to evaluate faculty members on a regular basis?
- Did the university survey students' satisfaction with the educational process during the course of study?
- Did the university conduct a survey on students' satisfaction with the educational process at graduation?
- Are you a member of the Alumni Association?
- Does the university follow up on your status after graduation?
- Did the university provide services and guidance to assist their graduates in finding employment?"

A "yes" responses to each of these questions was coded as 1 and a "no" response was coded as 0. Again the mean for each question was calculated for each institutional unit by averaging across the respondents who attended that unit and factor analysis was used to reduce the six dimensions into a single "accountability" factor.

The graduates' perception of the quality of the institutional unit they attended is captured by an overall question about the appropriateness of their educational experience and several other more specific questions on the appropriateness of their education along the following dimensions:

- Finding the first job
- Continued learning on the job
- Performance on the current job
- Preparation for future jobs
- Self-development
- Promoting your creativity

Again, respondents were asked to use a 5-point scale to rate appropriateness: (1) not at all appropriate, (2) inappropriate, (3) somewhat appropriate, (4) appropriate, (5) very appropriate.

⁴ By normalized, we mean that the mean of the variable is set to zero and each unit measures one standard deviation difference from the mean.

Once more, responses on individual dimensions were averaged across institutional unit and factor analysis was used to reduce them to a single normalized continuous factor named “perception of quality.”

4. Institutional Types

We classify higher education institutional units in our sample along three dimensions: (1) field of study (commerce vs. IT), (2) sector of ownership (public vs. private) and (3) selectivity (selective vs. non-selective). The first two dimensions are self-explanatory. To determine the selectivity of an institutional unit, we drew on information about the minimum grade in the final secondary school examination that is necessary to obtain admission into this institution. In all three countries, a high-stakes examination at the end of the upper secondary stage is used to centrally determine the allocation of students to higher education institutions. We ranked institutional units within their type (e.g. public IT, private commerce, etc.) from the highest to the lowest minimum grade of admission, and used the 75th percentile as a cutoff to distinguish between selective and non-selective institutions, with some exceptions.⁵ Private institutions in all three countries were predictably much less selective than public institutions. In fact, in Tunisia, we could not define a private and selective group of institutions since they all merely required passing the baccalaureate exam with a grade of 50%. In Jordan and Egypt, the 75th percentile minimum grade was often the same as the passing grade as well. In such cases, we defined as selective any private institution that uses a grade that is higher than the minimum passing grade for admission. It should therefore be kept in mind that many selective private institutions are likely to be less selective than some non-selective public institutions since selectivity is defined within each institutional type, not across all institutions. The distribution of institutions by type in our sample in each of the three countries is shown in Table 1.

5. Descriptive Results

We begin by highlighting some descriptive results about the three sets of quality measures of higher education in the three countries. We examine the components of each measure to discern patterns by country and then move to an examination of the composite indices and their correlates.

5.1 Pedagogical processes

There are some notable differences in pedagogy when comparing across countries. Figure 1 shows what pedagogical methods were used frequently in each country, classifying as frequently responses of “often” or “always” as compared to “sometimes,” “rarely,” or “never.” Among the teaching methods used, we classify “lectures” and relying on the “professor only” as the main source of information as traditional methods that reflect an unreformed pedagogical approach, whereas the other methods such as “computer-aided education,” “writing,” “oral presentations,” “analytical assignments,” and “group projects” as more innovative. As shown in Figure 1, a clear ranking emerges among the three countries in terms of pedagogical innovation. Egypt has the highest prevalence of “lectures” and “professor only” and the lowest prevalence on all other measures except for “theories,” where Jordan is lower. Conversely, Tunisia has the lowest prevalence of use of traditional approaches (lectures and professor only) and the highest prevalence of the more innovative approaches. Jordan typically occupies an intermediate position between Egypt and Tunisia, except for the use of multiple choice tests, where it has the highest prevalence and the use of theories, where it has the lowest.

5.2 Accountability practices

As explained earlier we use six different practices to measure the extent to which higher education institutions are accountable to their students/graduates. These six practices are

⁵ Because minimum required grades differ depending on the track that the student pursued in upper secondary school, we used the minimum grade specified for graduates of the science track to create our ranking.

shown in Figure 2. As in the case of pedagogy, educational institutions in Egypt are the worst performing among the three countries in terms of accountability practices. None of the practices considered are used in more than 3% of institutions in Egypt. However, contrary to pedagogical approaches, where it was the intermediate performer, Jordan does a lot better than Tunisia with regard to accountability practices. Over 40% of Jordanian institutional units have regular student evaluations of faculty members as compared to less than 10% for Tunisia and less than 5% for Egypt. Similarly, 38% of Jordanian institutions conduct student evaluations of the educational process during the course of study, as compared to 6% in Tunisia and 3% in Egypt. These results suggest that Jordanian institutions are at least attempting to be more accountable to their students than their counterparts in either Tunisia or Egypt.

5.3 Perceptions of quality

We measure students' perception of the quality of their higher education first through a general question about how appropriate were their studies to their current work. As shown in Figure 3, institutions in Jordan perform best on this overall measure, with only 16% of graduates saying that their education was either somewhat inappropriate or totally inappropriate. Egypt and Tunisia have similarly poor performance on this measure. In Egypt 34% of graduates deem their education totally inappropriate to the work they are currently doing, compared to 30% in Tunisia and only 8% in Jordan. The sum of those stating their education is either somewhat or totally inappropriate is 50% in Tunisia as compared to 44% in Egypt.

We then go into further detail, by inquiring whether the education they received was appropriate to specific stages of their careers, such as beginning work, current job performance and future career, or to different abilities they need at work, such as creative thinking, the ability to continue learning on the job, and one's own self-development. Again, as shown in Figure 4, on all these measures, higher education institutions in Egypt performed the worst relative to those in Tunisia and Jordan. There was no clear ranking on all these measures between Jordan and Tunisia. Jordanian institutions performed better on skills needed for the first job, performance in current job, and continuing education on the job, but Tunisian institutions performed better on imparting creative skills and abilities for self-development.

One reason that graduates may find a disconnect between the education system and the labor market is that growth in labor demand for educated youth has not kept pace with increases in educated labor supply. Figure 5 shows the distribution of the educational requirements of current jobs as reported by higher education graduates in all three countries. Nearly 60 percent of graduates in Tunisia report working in jobs that require less than bachelor-level education, compared to 45% in Egypt and 31% in Jordan. Similarly, 27% of graduates in Tunisia and 20% of graduates in Egypt report being in jobs that require only secondary education. Among the three countries, Jordan is the country that appears to have the best match between the education level obtained and the jobs graduates get, with nearly two thirds reporting that they work at jobs appropriate for their level of education.

To further assess the appropriateness of the education to the job people end up in, we asked individuals to assess on a 5-point scale the level of skill they have along various dimensions and the level of skill required by their jobs. We then calculated the difference between the two. A positive difference means that the respondent feels overqualified for their job on the relevant dimension and a negative difference means that they feel underqualified. Figure 6 shows the mean differences between the required skill level and their own personal skill in each of the three countries. The two countries where individuals reported being most overqualified for their jobs, Egypt and Tunisia, are also the two countries that have the highest positive gaps between personal skills and skill requirements of the job along various dimensions. Respondents from Egypt perceived themselves to be most overqualified when it came to foreign languages, writing reports, promotion and the selling of products, computer and

internet, explaining to others and working under pressure. Respondents from Tunisia were a close second. Tunisian respondents perceived themselves to be the most overqualified when it came ability to work with others, multi-tasking, acquiring new information quickly, negotiating, analyzing and capability in their chosen field. In all cases, Jordanian respondents were the most likely to say that their skills are closer to the requirement of their jobs. In some cases, such as effective time management, and acquiring new information quickly, they were modest enough to say that their skills with lower than what they job requires.

Ultimately, one of the most important measures of the success of the school to work transition is graduates' satisfaction with the jobs they obtain. Figure 7 shows the proportion of graduates that are satisfied or strongly satisfied with different aspects of their current positions. On the very important dimensions of alignment of the jobs with one's qualifications, Jordanian graduates stand out, with over 60% satisfied compared to just over 40% satisfied in Egypt and Tunisia. Jordan also has by far the highest level of satisfaction with pay and Tunisia the lowest. Jordan also performs best on satisfaction with type of work and number of hours and work schedules. Satisfaction with commuting distances and safety is fairly similar and relatively high in all three countries.

To conclude this section on perceptions of quality, Jordanian graduates report the highest perceptions of quality of their higher education along almost all the dimensions studied. They are more likely to report that the education is more appropriate to their jobs, that their jobs fit the qualifications that they acquired, that there is correspondence between their own skills on a number of dimensions and the requirements of their jobs, and that they are overall more satisfied with the jobs they got. Graduates from Tunisia and Egypt report lower perceptions of quality, possibly because they must function in more saturated labor markets where jobs that require the skills imparted by higher education are simply not available. While perceptions of quality and appropriateness are often fairly close in the two countries, Egyptian graduates are more consistently more dissatisfied with the quality of education they are receiving.

6. Multivariate Results

In this section, we review the results of the multivariate analysis, where we first reduce each of the three constructs we are interested in – pedagogy, accountability and perceptions of quality – into one continuous underlying factor that varies at the level of the institutional unit. We then test the extent to which these factors can be explained by the characteristics of the institutional units, namely sector of ownership, selectivity and field of study.⁶

The results of the factor analysis are shown in Table A1, A2 and A3 in the appendix. For each underlying construct, we report the scoring coefficients, factor loadings and uniqueness for the first factor for each of the three countries. Variables with high communality and therefore low uniqueness will have higher factor loadings and will therefore be more strongly associated with the underlying construct. Factor loadings are then transformed into scoring coefficients, which are similar to regression coefficients in that they represent changes in the underlying factor per unit of change in each of the original variables (Kim and Mueller 1978).

For the pedagogy factor, the factor loadings show that problem solving, oral presentations, the stress on applied knowledge, analytical assignments are positively associated with good pedagogy in Egypt. In Jordan, the strongest correlates of good pedagogy are applied knowledge, group projects and research projects, whereas in Tunisia, they are analytical assignments, oral presentations and problem solving.

⁶ The results of the multivariate analysis for Egypt and Jordan have already been reported in Assaad, Badawy and Krafft (2016). The results for Tunisia are reported here for the first time.

For the accountability factor, the factor loadings indicate that in Egypt better accountability is correlated with the use of evaluation of the education processes during the course of study, the use of teaching evaluations and the administration of satisfaction surveys upon graduation. In Jordan, good accountability is also indicated by the use of teaching evaluations and general evaluations during the course of study. In Tunisia, the strongest correlate is the administration of satisfaction surveys upon graduation, followed by the presence of career guidance, and the evaluation of educational processes.

The perception of quality factor is indicated by almost all the quality indicators in Egypt, except for the overall institutional satisfaction variable. In Jordan, the most important correlates of high perceptions of quality on the part of students are the usefulness of the education for continued learning on the job, for promoting creativity, for preparation for future jobs and for self-development. In Tunisia, similarly to Egypt, all the quality indicators are correlated with perception of quality factor except for overall institutional satisfaction.

The next step is to regress the predicted factors on the characteristics of institutional units, such as ownership (public or private), selectivity (selective or non-selective) and specialization (commerce or IT) and all the possible interactions among these three variables. The regressions are carried out separately for each country and are shown in Table A4 in the appendix.

In Egypt, it appears that private institutions have a positive and significant advantage in pedagogy, but since the private and IT interaction is also significant and negative, the advantage appears to be exclusively for private commerce institutions.⁷ Public non-selective IT institutions have an advantage over public non-selective commerce institutions. Overall, it appears that IT institutions have an advantage in pedagogy over commerce institutions in Egypt.⁸ However, selective institutions in Egypt do not appear to have an advantage over non-selective institutions in pedagogy. To illustrate the magnitude of these differences we show in Figure 8 the predicted value of the pedagogy index for different types of institutions in all three countries.⁹ In Egypt, it is clear that private institutions of all types have higher pedagogy scores than public institutions, with the exception of public non-selective IT institutions which are the best performing type of institution in Egypt along this dimension. The worst performing institutions are the public commerce institutions, whether they are selective or not.

Institutional characteristics are not associated in a statistically significant manner with either the accountability factor or the perception of quality factor in Egypt, but the predicted values shown in Figure 9 indicate that all four types of private institutions also perform better than their public counterparts on the accountability factor. The difference between the best performing type, namely private selective IT and the worst performing type, namely public selective IT is about one standard deviation, but the confidence intervals on the public institutions are quite large. With regards to the perception of quality factor, shown in Figure 10, there is no clear pattern by public/private in Egypt. The best performing type of institution on that measure are private selective commerce institutions, but their performance on this measure exceeds the worst performing type – public selective commerce – by less than one standard deviation.

In conclusion, the pattern for Egypt seems to be that private institutions appear to perform better than public ones on at least two of the quality measures, suggesting that incentives to perform are poorer in public institutions. It is especially noteworthy that selective public

⁷ A joint test of the private main effect and the private and IT interaction is statistically insignificant.

⁸ A joint test of all main effects and interactions involving the IT variable is statistically significant at the 1% level.

⁹ In this and the subsequent two figures public institutions are indicated by blue horizontal bars and private institutions by red bars.

institutions, which have a great deal of excess demand for their services, are often the least performing type on the three measures of quality we examine.

In Jordan, there are no statistically significant associations between institutional characteristics and any of the three factors, but this could be due to the fairly small institutional sample size there. An examination of the predicted value of the three factors by institutional type shown in Figures 8, 9 and 10 reveals a very different pattern from the one observed for Egypt. In terms of the pedagogy factor shown in Figure 8, all four types of public institutions in Jordan perform better than their private counterparts. There is a great deal of variance in performance within each type of public institutions as indicated by the large confidence intervals, but the best performing type – public selective IT institutions has a predicted pedagogy score that is more than 1.5 standard deviations higher than the worst performing type – private selective IT institutions. Similar differences exist between public selective commerce and private selective commerce.

As shown in Figure 9, public institutions in Jordan generally outperform their private counterparts in the accountability factor as well, but this is especially true for institutions in the IT specialization. Public not selective IT, the best performing type has an accountability score that is one standard deviation higher than private not selective IT and public selective IT institutions outperform their private counterparts by more than 0.5 standard deviations. Although institutions in the commerce specialization in Jordan generally perform worse than ones in IT on the accountability factor, the public ones seem to also outperform their private counterparts by about one half standard deviations.

Despite the apparently better performance of public institutions in Jordan on both the pedagogy and accountability factors, they are not perceived to be of better quality than private institutions. In fact, as shown in Figure 10, all four types of private institutions in Jordan perform better in terms of perception of quality than their public counterparts. This is especially true of private selective commerce institutions; whose perception of quality score is 2.2 standard deviations higher than public selective commerce institutions.

Thus, unlike Egypt, public institutions in Jordan, whether selective or not, appear to have sufficient incentives to use better pedagogy and accountability processes. However, they are still not perceived by their graduates to be superior to their private counterparts. This is probably because public institutions in Jordan, even the less selective ones, attract a higher caliber of student than the private institutions. These higher caliber students probably have higher expectations of quality and may therefore be tougher critics.

We now turn to the Tunisia results on the three factors. Again, based on the regression results, there are no statistically significant differences among various institutional types in Tunisia in terms of the pedagogy and perception of quality factors, but private institutions (which are all non-selective in Tunisia) do have a significant advantage when it comes to the accountability factor. A test of the sum of the private main effect and the private and IT interaction is also statistically significant, which confirms that private institutions in both specializations are in fact more accountable to their clients in Tunisia.

As shown in the right panel of Figure 8, there is very little difference in the pedagogy factor across institutional types in Tunisia. The difference between the best performing type – private no selective IT – and the worst performing type – public selective commerce – does not exceed 0.5 standard deviations. The same is true for the perception of quality factor, which is shown in Figure 10.

The pattern is quite different for the accountability factor in Tunisia. Private institutions in Tunisia far exceed their public counterparts in this factor. Private not selective commerce institutions exceed public non-selective commerce institutions in Tunisia by 1.4 standard

deviations, and exceed public selective commerce institutions by 1.55 standard deviations. Similarly, private non-selective IT institutions exceed public non-selective IT institutions by 0.9 standard deviations and public selective IT institutions by one standard deviation. As in the case of Egypt, non-selective public institutions outperform their selective counterparts in Tunisia on the accountability factor, although the differences are not statistically significant. This again suggests that the oversubscribed selective institutions perceive little need to be accountable to their clients.

7. Conclusions

The main question addressed by this analysis is how characteristics of higher education institutions, namely public/private ownership, the degree of selectivity and specialization, affect the quality of higher education processes. We specifically examined pedagogical practices and accountability and the perception of quality on the part of institutions' graduates. We investigated this question in Egypt, Jordan and Tunisia by analyzing data from surveys of higher education graduates in all three countries that focused on graduates from the IT and commerce specializations. The reason for focusing on these two specializations was to reduce the extent of heterogeneity in the data by limiting the number of fields, but also to maximize the probability of getting graduates from private institutions, which are more likely to specialize in these two fields. The selectivity variable is a dichotomous variable which defines as selective the institutions that require a score for admission that is above the 75th percentile institution in its class (say public IT or private commerce). Since public institutions typically require much higher scores for admissions, non-selective public institutions could in fact require a higher score than selective private institutions.

First we explore descriptively the various indicators underlying our three concepts of pedagogy, accountability and perceptions of quality in the three countries. A clear ranking emerges in terms of innovative pedagogical practices in the three countries, with Egypt having a preponderance of traditional pedagogical practices, such as exclusive reliance on lectures and materials supplied by the professor, and Tunisia having the highest prevalence of innovative techniques, such as computer-aided education, group projects, research projects, etc. Jordan occupied an intermediate position on pedagogy. When it came to accountability processes, Egypt is still the worst performer among the three countries, but Jordan is now the best performer, with nearly 40% of institutional units there having regular teaching evaluations as compared to 10% for Tunisia and 5% for Egypt. With regard to perceptions of quality on the part of graduates, Jordan is best performer among the three countries with only 16% of students deeming their education either totally or somewhat inappropriate, compared to 44% for Egypt and 50% in Tunisia.

One of the reasons graduates find their higher education inappropriate is the fact that many of them end up being overqualified for the jobs they obtain. The rapid expansion of higher education in all three countries means that the demand for graduates has not kept up with the supply. Nearly 45% of Egyptian graduates and 60% of Tunisian graduates deem that their jobs require only a secondary school education or less. In Jordan, that proportion is lower at 31%, which could explain why Jordanian graduates are somewhat more satisfied with their education. Almost 62% of Jordanian graduates deem that their job aligns with their qualifications, as compared to 42% for Egypt and Tunisia.

Our multivariate analysis indicates that sector of ownership does matter, but differently in different contexts. In Egypt, private institutions appear to offer better pedagogy and accountability than their public counterparts, but this result appears to be reversed in Jordan, albeit with weak statistical significance. However, despite under-performing their public counterparts in pedagogy and accountability, private institutions in Jordan are perceived as being of better quality by the graduates. We attribute this to the fact that graduates from public

institutions are generally stronger students, who may have higher standards of quality. In Tunisia, sector of ownership only matters for accountability and, like Egypt, private institutions there perform much better on accountability processes than their public counterparts, despite being much newer and much less selective.

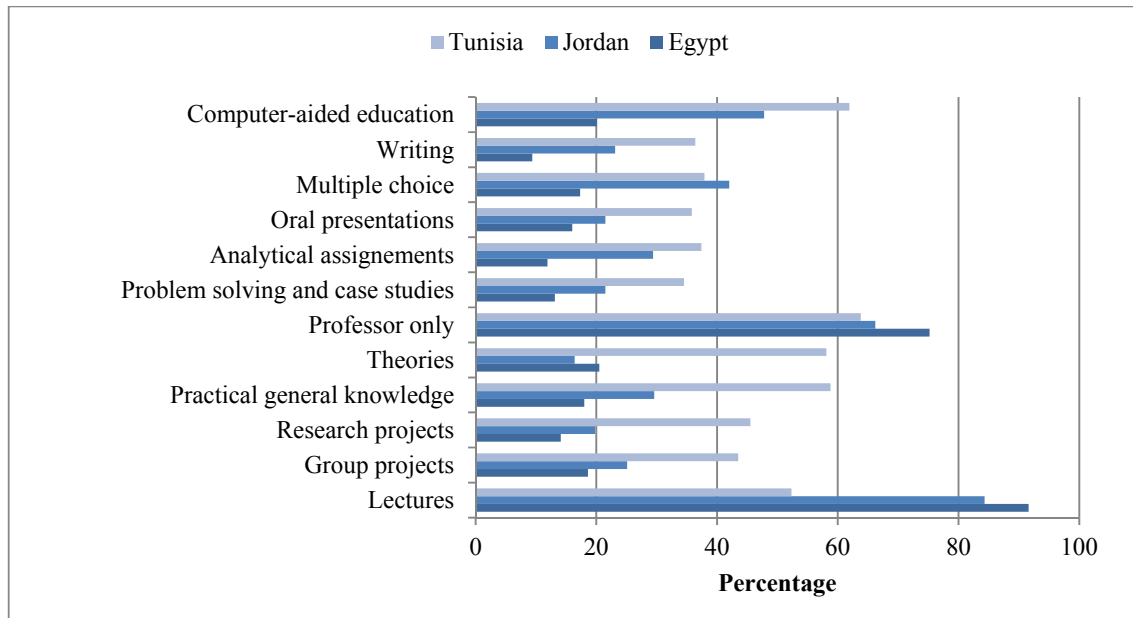
Although we did not find statistically significant results across the selectivity dimension, the overall results indicate that selective institutions tend to be worse performers than non-selective one even in the public sector. This suggests that institutions that are oversubscribed and in which admission is strongly rationed can essentially take their student clients for granted and can continue to adopt outdated pedagogical practices and ignore the need for accountability. Institutions that are less selective and must therefore compete for students tend to make a bigger effort at being innovative pedagogically and more accountable.

We therefore conclude that incentives do matter for the processes that higher education institutions adopt. The more institutions are shielded from the market through public ownership or highly rationed admission processes, the less likely they are to adopt good processes. Jordan is a bit of an exception here, where it appears that public institutions and ones that are selective are the best performers. This could be due to the fact that public institutions in Jordan have substantially greater autonomy of decision-making than in either Egypt or Tunisia (see Barsoum 2014, Barsoum and Mryyan 2015, Boughzala, Ghazouani and Ben Hafaiedh 2016).

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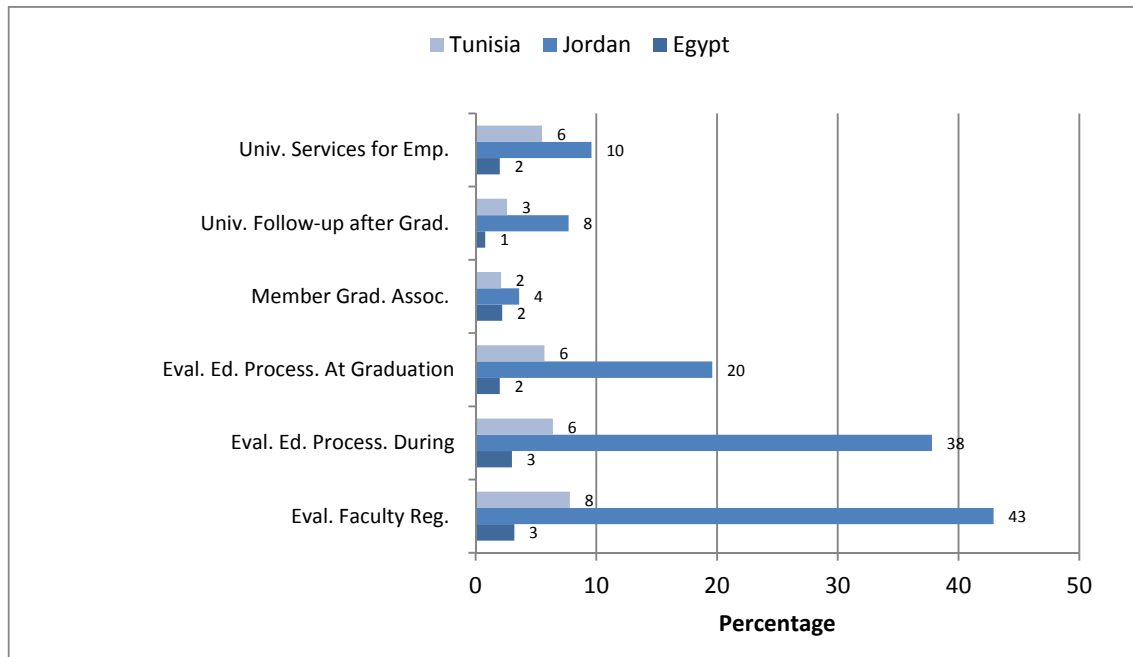
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Figure 1: Pedagogical Approaches by Country (Percentages)



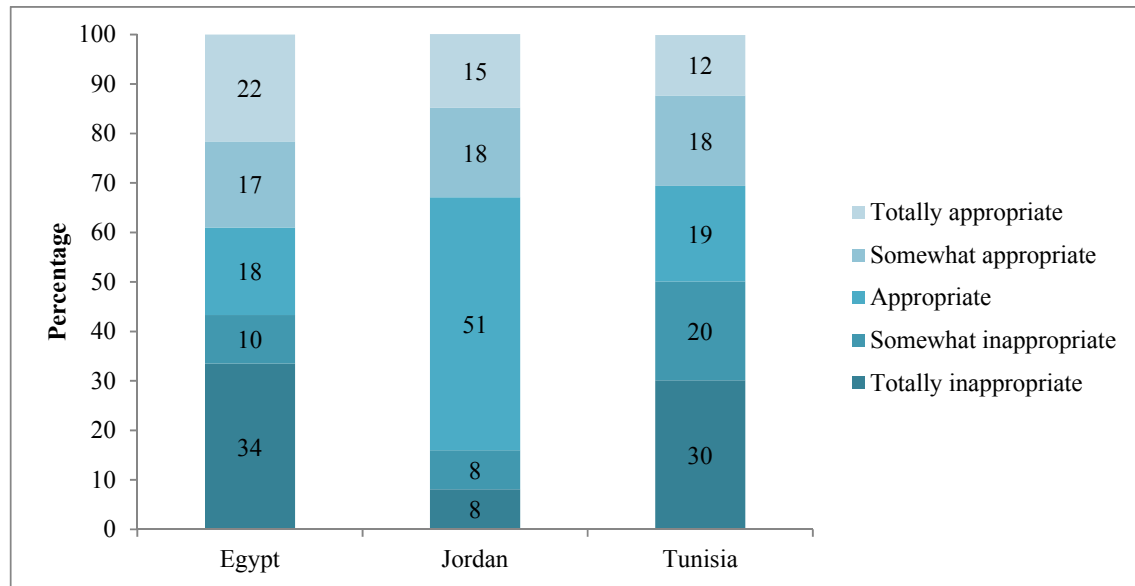
Source: Authors' calculations based on Egypt, Jordan, and Tunisia HEGSS

Figure 2: Prevalence of Accountability Practices by Country (Percentage)



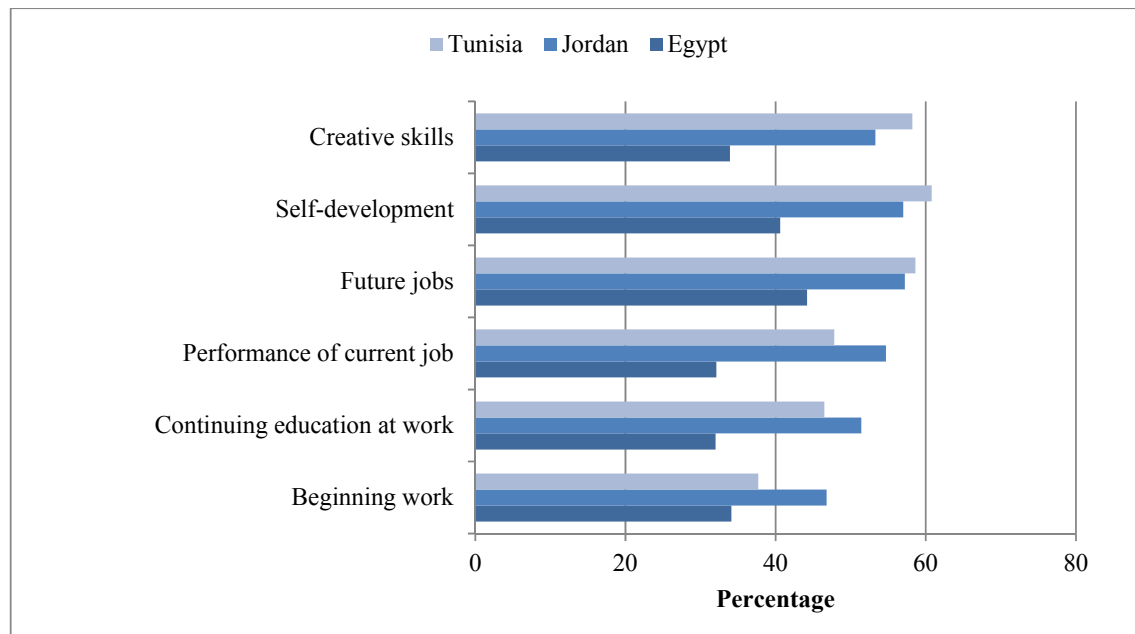
Source: Authors' calculations based on Egypt, Jordan, and Tunisia HEGSS

Figure 3: Appropriateness of Field of Study for Current Work by Country (Percentages)



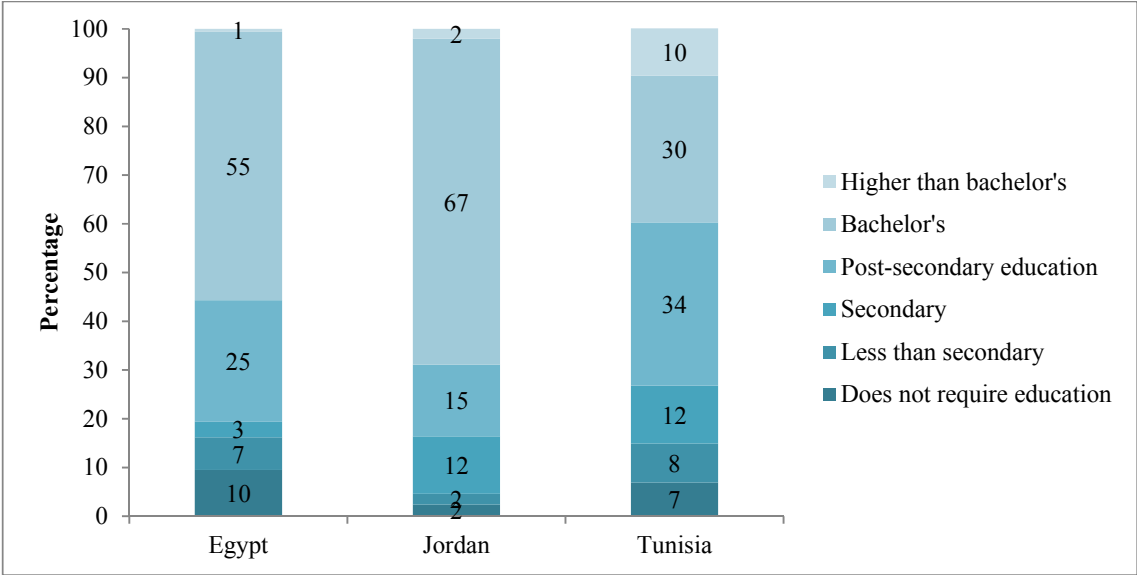
Source: Authors' calculations based on Egypt, Jordan, and Tunisia HEGSS

Figure 4: Appropriateness of Bachelor Studies to Different Aspects of Work Transition by Country (Percentage Reporting Good Or Very Good Appropriateness)



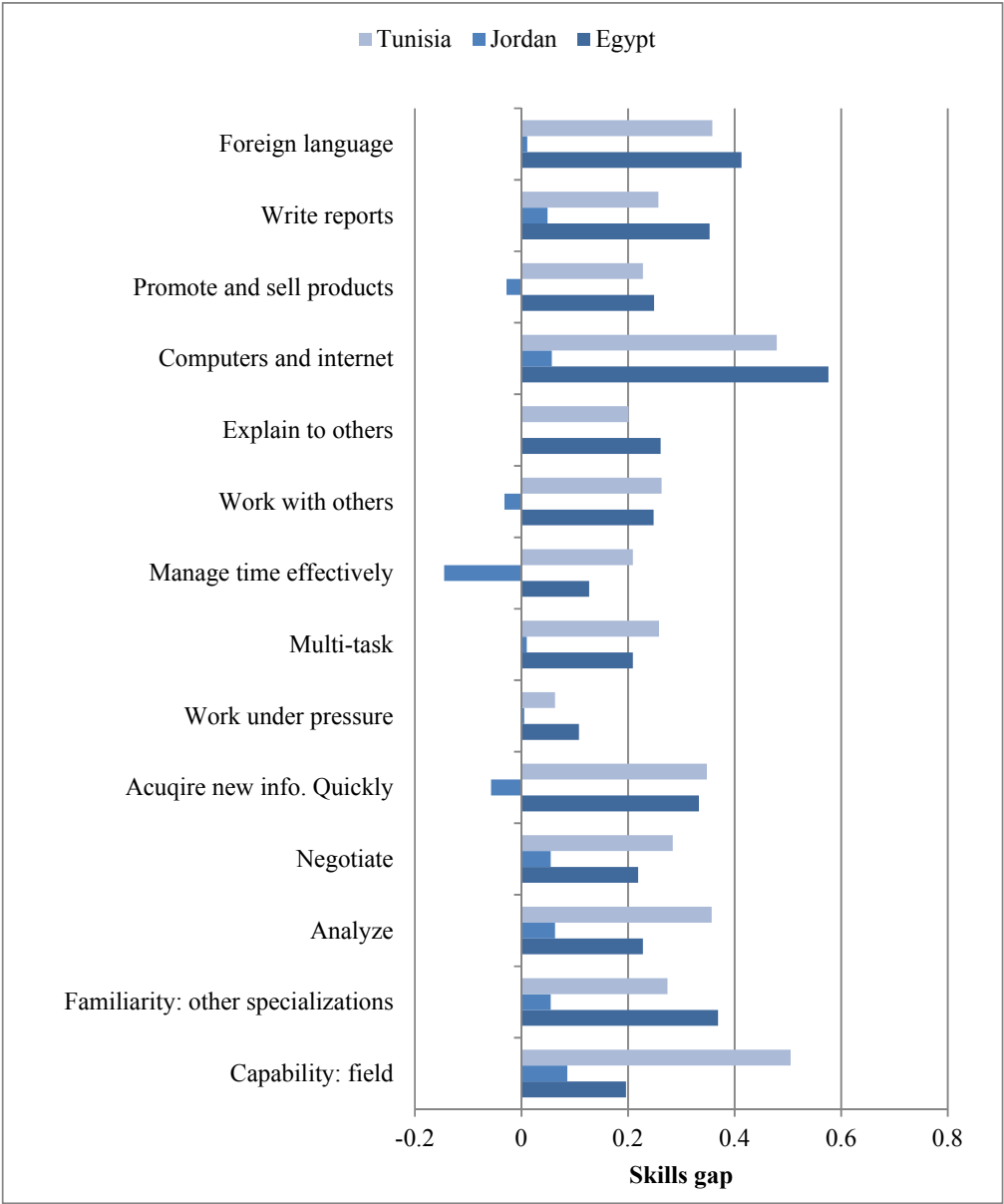
Source: Authors' calculations based on Egypt, Jordan, and Tunisia HEGSS

Figure 5: Educational Requirements of Current Job by Country (Percentage)



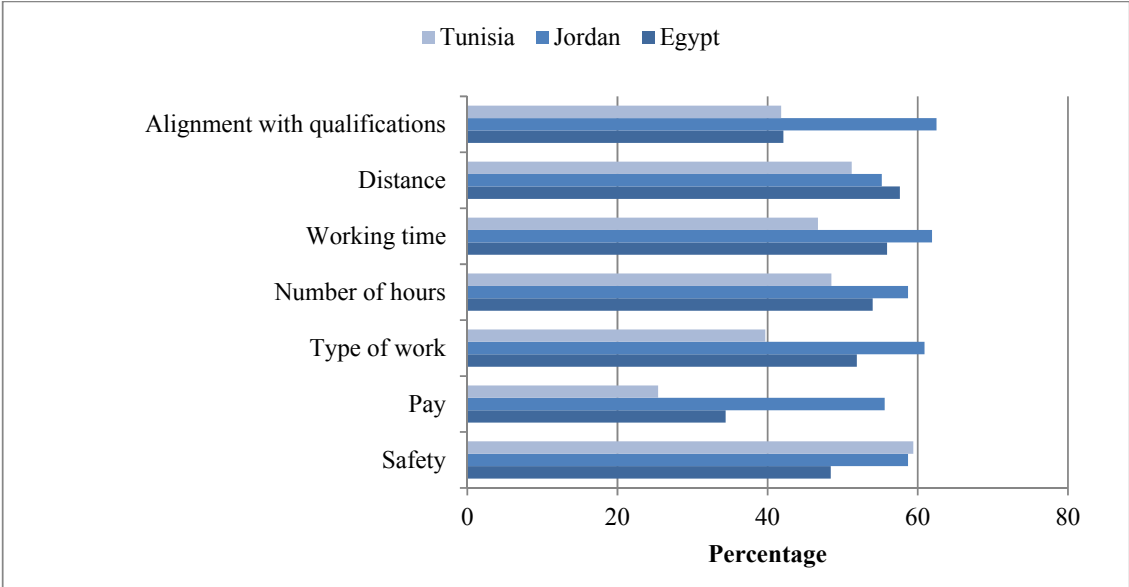
Source: Authors' calculations based on Egypt, Jordan, and Tunisia HEGSS

Figure 6: Skills Gap (Five Point Scale) between Personal Skills and Level of Skills Required on The Job, by Country



Source: Authors' calculations based on Egypt, Jordan, and Tunisia HEGSS

Figure 7: Satisfaction with Job Aspects by Country (Percentages)



Source: Authors' calculations based on Egypt, Jordan, and Tunisia HEGSS

Figure 8: Predicted Value of Pedagogy Factor by Type of Institutional Unit, Egypt, Jordan and Tunisia

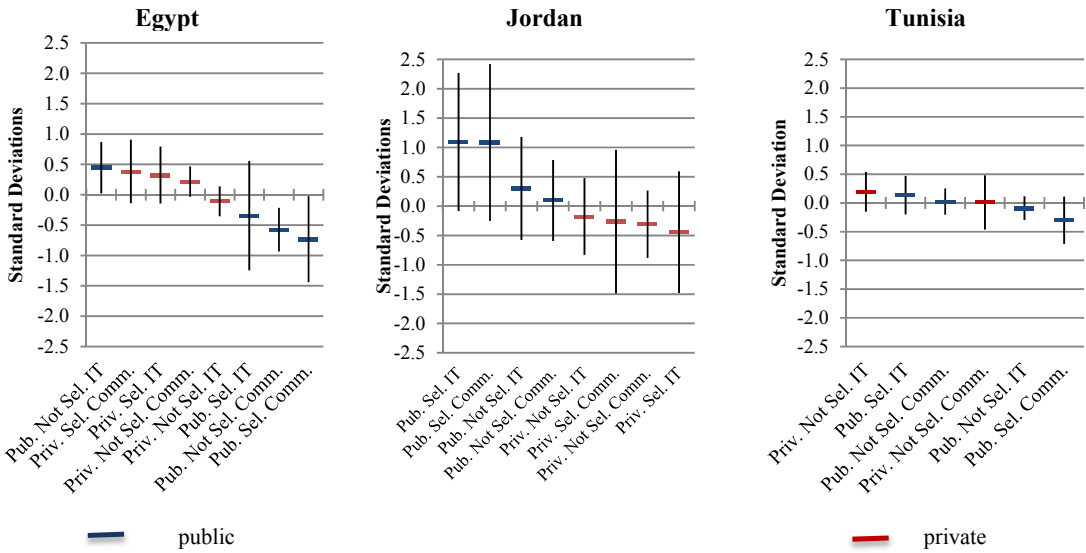


Figure 9: Predicted Value of Accountability Factor by Type of Institution in Egypt, Jordan and Tunisia

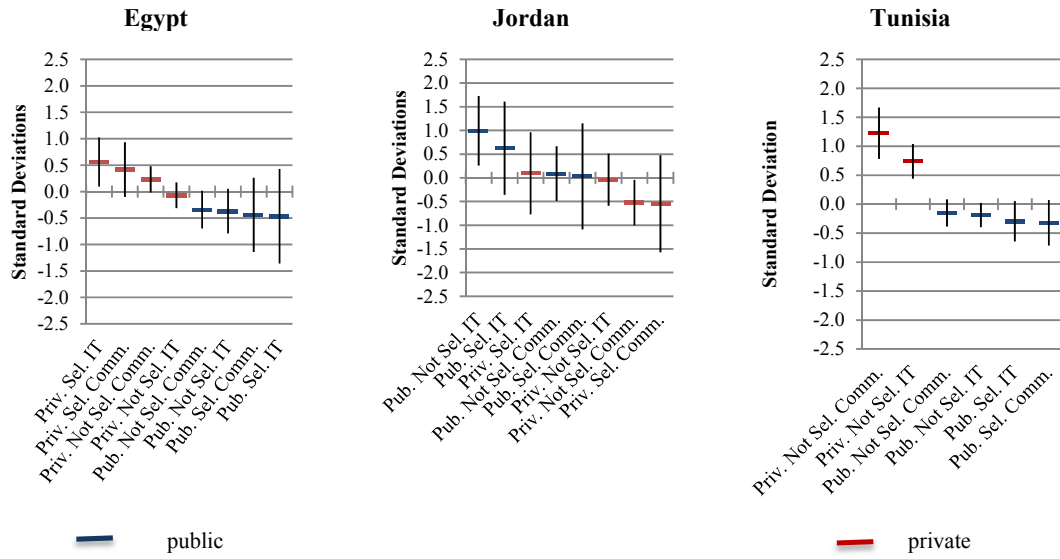
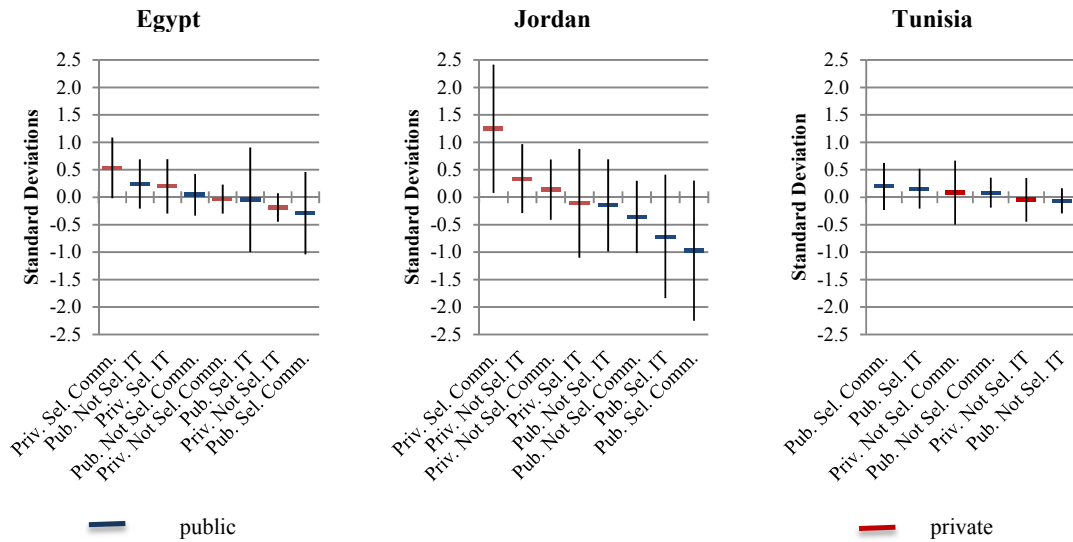


Figure 10: Predicted Value of Perception of Quality Factor by Type of Institution in Egypt, Jordan and Tunisia



Source: Egypt and Jordan results are from Assaad, Badawy and Krafft (2016). Tunisia results are based on authors' calculations using data from Tunisia HEGS.

Table 1: Distribution of Institutional Units by Type and by Country

Type of Institutional Unit	Egypt	Jordan	Tunisia
Non-selective Commerce			
Public	21	7	39
Private	39	14	11
Non-selective IT			
Public	14	6	49
Private	45	10	24
Selective Commerce			
Public	5	2	14
Private	9	2	n.a.
Selective IT			
Public	3	3	18
Private	11	3	n.a.
Private	104	29	35
Selective	28	10	32
IT	73	22	91
Total	147	47	155

Source: Authors' calculations based on Egypt, Jordan, and Tunisia HEGSS

Appendix A: Results of Factor Analysis

Table A1: Scoring Coefficients, Factor Loadings and Uniqueness for the Pedagogy Factor by Country

Frequency of method use:	Egypt			Jordan			Tunisia		
	Scoring coefficient	Factor loading	Unique-ness	Scoring coefficient	Factor loading	Unique-ness	Scoring coefficient	Factor loading	Unique-ness
Problem solving	0.234	0.873	0.149	0.026	0.335	0.887	0.115	0.719	0.483
Oral presentation	0.206	0.863	0.144	0.013	0.414	0.828	0.157	0.753	0.434
Applied knowledge	0.179	0.827	0.209	0.406	0.857	0.264	0.122	0.503	0.747
Group projects	0.133	0.79	0.204	0.279	0.798	0.362	0.097	0.579	0.665
Research projects	0.12	0.778	0.224	0.217	0.705	0.502	0.121	0.578	0.666
Analytical assignments	0.091	0.825	0.221	0.074	0.367	0.864	0.313	0.850	0.278
Writing topics	0.072	0.779	0.315	0.055	0.566	0.679	0.126	0.644	0.585
Computer-aided education	0.056	0.68	0.435	0.019	0.358	0.871	0.049	0.411	0.831
Multiple-choice questions	0.046	0.623	0.516	0.114	0.527	0.721	0.132	0.633	0.599
Use of theories	0.029	0.556	0.58	0.114	0.495	0.754	0.082	0.389	0.849
Lectures	-0.019	-0.204	0.706	-0.045	-0.03	0.999	0.068	0.456	0.792
Exclusive use of materials authored by professor	-0.038	-0.272	0.562	0.09	0.325	0.894	0.029	0.139	0.981
N (HE Inst. Units)		147			47			162	

Table A2: Scoring Coefficients, Factor Loadings and Uniqueness for the Accountability Factor by Country

Prevalence of:	Egypt			Jordan			Tunisia		
	Scoring coefficient	Factor loading	Unique-ness	Scoring coefficient	Factor loading	Unique-ness	Scoring coefficient	Factor loading	Unique-ness
Evaluation of education processes during the course of study	0.503	0.921	0.151	0.301	0.661	0.562	0.201	0.812	0.340
Teaching evaluations	0.28	0.871	0.24	0.407	0.749	0.437	0.181	0.783	0.386
Satisfaction survey upon graduation	0.126	0.73	0.466	0.087	0.37	0.863	0.334	0.877	0.231
Follow-up surveys after graduation	0.102	0.532	0.716	-0.229	-0.457	0.79	0.081	0.583	0.660
Employment and career guidance	0.058	0.505	0.744	-0.178	-0.451	0.796	0.297	0.848	0.281
Membership in alumni association	0.047	0.396	0.842	-0.115	-0.423	0.821	0.007	0.154	0.976
N (HE Inst. Units)		147			47			175	

Table A3: Scoring Coefficients, Factor Loadings and Uniqueness for the Perceptions of Quality Factor by Country

Perception of:	Egypt			Jordan			Tunisia		
	Scoring coefficient	Factor loading	Uniqueness	Scoring coefficient	Factor loading	Uniqueness	Scoring coefficient	Factor loading	Uniqueness
Promoting creativity	0.246	0.912	0.167	0.131	0.769	0.408	0.181	0.787	0.381
Preparation for future jobs	0.194	0.916	0.159	0.206	0.769	0.408	0.192	0.824	0.322
Self-development	0.169	0.891	0.204	0.404	0.755	0.429	0.195	0.807	0.349
Continued learning on job	0.165	0.871	0.24	0.191	0.801	0.357	0.177	0.800	0.360
Appropriateness of study to finding first job	0.161	0.835	0.302	0.059	0.556	0.69	0.124	0.729	0.469
Current job performance	0.151	0.855	0.267	0.272	0.553	0.693	0.265	0.870	0.243
Overall institutional satisfaction	0.009	-0.006	1	0.038	0.285	0.918	0.003	0.047	0.998
N (HE Inst.)		147			47			148	

Table A4: OLS Regression Results for Pedagogy, Accountability and Perception of Quality Factors on Characteristics of Higher Education Institutional Units in Egypt, Jordan and Tunisia

	Egypt			Jordan			Tunisia		
	(1) Pedagogy Factor	(2) Accountability Factor	(3) Perception of Quality Factor	(1) Pedagogy Factor	(2) Accountability Factor	(3) Perception of Quality Factor	(1) Pedagogy Factor	(2) Accountability Factor	(3) Perception of Quality Factor
Selective	-0.101 (0.466)	-0.040 (0.463)	-0.319 (0.490)	0.830 (0.787)	-0.049 (0.685)	-0.179 (0.782)	-0.323 (0.284)	-0.169 (0.277)	0.114 (0.306)
Private	0.732** (0.254)	0.461+ (0.252)	-0.011 (0.267)	-0.321 (0.454)	-0.339 (0.395)	-0.300 (0.451)	-0.014 (0.318)	1.378*** (0.304)	0.002 (0.388)
Selective and Private	0.364 (0.581)	0.311 (0.577)	0.931 (0.610)	-0.723 (1.082)	-0.074 (0.941)	1.296 (1.075)	0.000 (.)	0.000 (.)	0.000 (.)
IT	1.030** (0.323)	-0.030 (0.321)	0.220 (0.340)	0.110 (0.546)	0.866+ (0.475)	0.552 (0.543)	-0.113 (0.185)	-0.035 (0.191)	-0.148 (0.215)
Selective and IT	-0.649 (0.757)	-0.019 (0.751)	0.046 (0.795)	0.039 (1.050)	-0.497 (0.913)	-0.247 (1.042)	0.550 (0.370)	0.061 (0.370)	0.107 (0.401)
Private and IT	-1.369*** (0.383)	-0.307 (0.380)	-0.341 (0.402)	0.140 (0.681)	-0.531 (0.592)	-0.405 (0.676)	0.297 (0.400)	-0.452 (0.376)	0.016 (0.477)
Selective Private and IT	0.903 (0.890)	0.482 (0.883)	-0.284 (0.935)	-0.433 (1.439)	0.359 (1.252)	-0.461 (1.429)	0.000 (.)	0.000 (.)	0.000 (.)
Constant	-0.544** (0.205)	-0.263 (0.203)	-0.021 (0.215)	0.030 (0.371)	0.010 (0.323)	0.000 (0.369)	0.023 (0.138)	-0.152 (0.142)	0.082 (0.164)
N (Observations)	147	147	147	47	47	47	143	155	130
R-squared	0.125	0.089	0.041	0.143	0.199	0.118	0.024	0.229	0.012

Notes: +<0.10, *p<0.05, **p<0.01, ***p<0.001. Reference case for institutional characteristics is a public, non-selective, commerce program. There are no private selective institutions in Tunisia

Source: Authors' calculations