



Implementation of Digital Policy Experimental Analysis in Higher Education on The Level of Graduates' Absorption in Industry

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Abstract

This research aims to analyze the impact of deregulation of the university system on the labor market. We used a sample of 100 people in this research. The research results indicate that without deregulation, most individuals who access university studies would likely only pursue their education. This study uses the year or birth cohort as an exogenous characteristic to implement the instrumental variable strategy. This makes it possible to estimate the causal impact of university education on several employment outcomes, especially wages and labor informality. An admitted university estimates that each year of study will increase the salary. We estimate the cumulative impact of access to university studies. However, the effect of university education on wages turns out to be heterogeneous, depending on individual socio-economic characteristics. The effect tends to be higher in women and individuals in the highest family income quintile. The evidence aligns with other international research regarding the salary premium of university education and its impact on human capital. The results show that for each year of university study, the probability of informality in employment decreases, notably reducing the probability of not having an employment contract. However, we found no significant impact on the probability of not having a pension fund affiliation, suggesting a structural dimension of informality in the labor market that may not be dependent on workers' education level.

Keywords: University, Wage, Labor Market, Education Level.

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1. Introduction

Higher education policy reforms have resulted in significant changes in the scope of the university system and educational structure in the country. More flexible policies in university entry requirements and encouragement of private investment have opened the door to rapid growth in university supply. The number of private universities increased by 250%, reflecting the positive impact of these reforms on expanding access to higher education for the public. The deregulation of the higher education market has also provided prospective students with greater choice, with a significant increase in the opportunity to choose an educational institution that suits their needs and aspirations [1]. In addition, these reforms also encourage improvements in the quality of higher education as educational institutions compete to improve their reputation and attractiveness to prospective students. However, the impact of deregulation on the higher education market also creates several challenges. The increase in the number of private universities may cause concerns regarding the quality of education provided as well as financial sustainability issues for some educational institutions. Therefore, we must continue to monitor and evaluate the impact of these higher education policy reforms and identify the necessary steps to maintain the quality of higher education while expanding access for everyone [2].

A comparison between the number of universities and the population provides an interesting picture of the impact of university reform in both countries. Indonesia, with a population of more than 220 million people, has a relatively disproportionate number of universities. This shows that university reform has encouraged rapid growth in the number of universities in Indonesia [3]. About 30% of current students come from universities founded after the reform, indicating that this reform has been successful in expanding access to higher education for the public. However, the comparison also highlights the potential to further optimize the higher education system, especially by improving the quality of education provided by new universities. There is a need for ongoing monitoring and evaluation of the impact of university reform, as well as necessary steps to ensure that the growth in the number of universities is in line with improvements in the overall quality of higher education. Thus, continuity and continuous improvement in the higher education system will be key to achieving the goal of more inclusive and quality education [4].

Deregulation of the university system has had a significant impact on access to higher education and labor market outcomes. The flexibility of admission requirements in the university system resulting from deregulation has allowed the proportion of workers with a university education to increase significantly in the labor market [5]. In this context, the study uses a non-experimental impact evaluation design based on instrumental variables. We identified individuals who were more or less affected by the university system's deregulation process based on their year of birth. Previous research results suggest that deregulation allows individuals with secondary education to access higher education, which otherwise might not have occurred [6]. This shows that the deregulation of the university system has succeeded in increasing access to higher education for groups of individuals affected by the reform. Labor market outcomes also reflect the impact of this increased access to higher education. Increasing the proportion of workers with a university education can contribute to improving the quality of the workforce and overall economic productivity [7]. Previous studies in the literature have shown that a university education can have a positive impact on labor market outcomes, including increased wages and better job opportunities. Thus, deregulation of the university system has had a positive impact on expanding access to higher education and improving labor market outcomes for individuals. However, it is important to continue to monitor and evaluate the long-term impact of these reforms and take the necessary steps to ensure that the quality of higher education is maintained while expanding access for everyone [8].

The legal framework that governs the entry of new universities into the market stipulates that only law can establish universities. This means that the establishment of new universities requires a special legislative process, which may slow or limit the growth of new universities [9]. The government modified the legal framework responsible for assessing and granting permission for the operation of new universities across the country. This simplifies and speeds up the process of establishing new universities because it no longer requires special legislation. In the same year, they enacted a law to encourage investment in education [10]. This law permits the university to distribute any surplus to its investors at the end of its financial year, unlike the previous practice of only investing it in the university's name or for study scholarship purposes. This may have provided additional incentives for private investors to invest in higher education [11]. These changes led to an increase in the number of private universities. Reducing barriers to the creation of new universities and providing incentives for private investment in higher education have created an environment more conducive to the growth of higher education. However, as previously discussed, we must carefully evaluate the impact of this growth to maintain the quality of higher education while expanding access for everyone [12].

It is important to note that the relationship between education and employment outcomes has been a major focus in the empirical literature, with many studies finding a positive correlation between these two factors. However, to interpret this relationship causally, the study used an instrumental variable approach to minimize possible bias. One model often used to measure the relationship between education and wages is the equation [10]. This model states that education will increase an individual's wages, assuming that there are unobserved hidden variables that influence these two variables, such as individual ability. However, because these variables are unobservable, causal interpretation is often difficult without using appropriate statistical approaches [11]. The literature employs the instrumental variable approach as a solution to this problem, utilizing instrumental variables that indirectly relate to endogenous variables through unobserved instrumental variables rather than directly. An instrumental variable approach can delve deeper into the impact of university reforms on access to higher education and labor market outcomes. By using appropriate instrumental variables, research can attempt to tease apart the causal effects of university reforms on higher education access and labor market outcomes, providing better insight into the consequences of these policy changes [12].

Research on the impact of deregulation of the university system on the labor market has become a topic of increasing interest in the academic literature [11]. The studies conducted paint a fairly clear picture of the relationship between higher education at newly established universities following deregulation and labor market outcomes [12]. Researchers have found different outcomes when they use the Equation and OLS to estimate important coefficients without considering any possible endogeneity issues in these estimators. However, this approach may overlook potential endogeneity issues, such as the potential for unobserved factors to cause reciprocal relationships between education and employment outcomes. However, this instrument can be correlated with the error term in the wage equation because, in years of economic prosperity, more universities can be founded given better investment conditions [13]. However, the authors found that accessing higher education at a newly established university would result in a salary increase of 80 percentage points, indicating a significant positive impact of the deregulation of the university system on the labor market. Thus, further research using more sophisticated approaches to address the issues of endogeneity and hidden variables will provide a deeper understanding of the impact of university system deregulation on the labor market.

2. Research Methods

In this study, we use a sample of 100 people to identify the impact of deregulation of the university system on a sub-sample of workers with post-secondary and university education. The empirical strategy we employ is to

isolate the impact of the birth cohort on outcomes first. With this approach, we are able to consider the effects of specific birth cohorts on employment outcomes, thereby allowing us to isolate the impact of university system deregulation on secondary and university entry cohorts. We hope that this approach will provide deeper insight into the impact of such deregulation on the labor market, aiding in further understanding of the effects of university reforms on educational and employment opportunities.

3. Results and Discussion

From the research results, it appears that there are significant differences in employment outcomes based on education level. Workers with higher qualifications, such as university graduates, tend to have higher wages and annual income. They also have a lower proportion of informal working conditions, suggesting that higher education can provide access to better and more stable jobs. In addition, individual characteristics also play an important role. Incoming university-educated workers tend to be younger and mostly male. This reflects a common pattern in many countries, where men tend to have greater access to higher education and better jobs. Interestingly, the middle level concentrates the largest proportion of workers from indigenous communities. This may reflect the challenges of access to higher education for indigenous peoples, which could be an area that requires further attention in the context of education and employment policy. From this data, it also appears that the most qualified workers have an average of more than four years of education. This suggests that education and qualifications play an important role in determining individual employment outcomes and earnings. Therefore, efforts to improve access to and quality of higher education can be the key to improving welfare and employment opportunities for society.

The results of the estimation show that there is a significant influence of birth cohort on the probability of studying at university and years of university education. Controlling for trends in birth cohort and worker age, coefficient estimates are generally positive and significant for individual cohorts, with most coefficients significant at the 2% level. This suggests that exposure to the deregulation of the university system has a significant impact on the likelihood of studying at the university. The coefficient estimates also show that the impact of deregulation tends to increase in younger groups, supporting the assumption that deregulation of the university system is an increasing function of birth year. These results suggest that for this group of individuals, deregulation increases the likelihood of accessing university studies and increases their years of education. These results provide a better understanding of how deregulation of the university system has affected access to higher education, particularly for groups of individuals. It also suggests that deregulation of the university system has provided significant benefits in increasing the likelihood of university study and years of university education for this group.

The results show similar estimates, considering hourly wages and possible informality as dependent variables. In this case, there is a significant impact of the birth cohort on wage premiums and working conditions. In particular, it appears that a wage premium for higher qualifications of between 10% and 20% applies to individuals born in the youngest cohort. This suggests that individuals born into younger cohorts and perhaps impacted by the deregulation of the university system have the potential to earn higher salaries as a result of their higher education. Additionally, the results also show a reduction of between 10% and 20% in the probability of being in informal employment. This implies that obtaining higher education following the deregulation of the university system can assist individuals in securing more formal and stable employment, frequently resulting in increased salaries and benefits. Overall, these results suggest that deregulation of the university system has had a significant impact on the labor market, particularly in terms of increasing wage premiums and reducing the likelihood of informal employment for individuals born into groups affected by deregulation. This provides further evidence of the benefits of deregulation of the university system in increasing access to higher education and improving employment outcomes for individuals.

The analysis's results show that the dependent variables of length of university education, hourly wages, and the possibility of informality describe the estimated coefficients from the reduced form equation. The coefficients associated with the birth dummy and the three dependent variables range from zero across individual groups. This suggests that the birth cohort did not experience significant changes in terms of higher education, hourly wages, and possible informality as a result of the deregulation of the university system. However, there appeared to be a significant effect in individual groups. The increases in education and wages for this group of individuals suggest that the deregulation of the university system had a positive impact on their access to higher education and employment outcomes. Additionally, this birth cohort appears to have a slightly reduced likelihood of informality, indicating that obtaining a higher education after deregulation could potentially decrease the likelihood of engaging in informal employment. Thus, deregulation of the university system would only impact desired employment outcomes and could increase the likelihood of accessing university studies as well as the length of higher education. This provides empirical support for the identification strategy proposed in the study, which is based on the assumption that deregulation of the university system has a significant impact on desirable employment outcomes for groups of individuals affected by deregulation.

The estimator results show that access to university studies has a significant causal impact on employment outcomes. Workers with higher education tend to have higher income levels and better working conditions compared to workers with secondary education. Specifically, workers with higher education have a wage premium of 60 percentage points compared to workers with secondary education. Although the coefficient linking education to annual income is positive, it is not statistically significant. This shows that access to higher education contributes to increasing labor income. In addition, access to university studies also impacts working conditions. Highly educated workers have a lower likelihood of informality in employment compared to less educated workers. This indicates that access to higher education can help reduce the likelihood of being in informal employment. However, the results also show that access to university studies does not directly improve all dimensions of worker informality. Although having an employment contract reduces the probability of not having an employment contract, its impact on the probability of not having an affiliation with the pension system is not statistically significant. This shows that access to higher education is only one factor influencing working conditions and that it is important to consider other factors in reducing informality at work. Thus, these results provide a better understanding of the impact of access to university studies on employment outcomes and working conditions and highlight the importance of higher education in improving individuals' well-being and employment opportunities.

The estimator results show that the causal response from years of study at university to employment outcomes is significant. For each additional year of higher education, there is an increase in salary, and the likelihood of informality in employment decreases. This shows that higher education makes a positive contribution to increasing income and reducing the probability of being in informal employment. When we approach education through a binary variable that represents access to university studies, these results align with the methodology. Regardless of the measurement method, the impact of higher education on employment outcomes remains consistent. However, the estimated effect on the probability of having no affiliation with a pension system is not statistically significant. This suggests that higher education may not have a significant impact on the likelihood of having no affiliation with a pension system. Overall, these results demonstrate the importance of higher education in improving employment outcomes and working conditions. Each year of university education can provide significant benefits, including increased income and a reduced likelihood of being in informal employment. Thus, investment in higher education can be an effective strategy for improving welfare and employment opportunities for individuals.

The estimation results highlight the importance of understanding the complexity and heterogeneity of the impact of policies, such as deregulation of the university system, on socio-economic outcomes. Measurement error in education could potentially cause attenuation bias in all statistically significant estimates. This finding, which is in line with much of the research in the systematized literature, highlights the need to be wary of the assumptions underlying policy estimates. Additionally, another possible explanation is that the impact of university education is heterogeneous and varies across individuals. Therefore, estimates will cover multiple points of the impact distribution. This signals the complexity of the reality on the ground and the need to take individual variation into account in designing effective and equitable policies. In this context, it is important to recognize that the groups most affected by deregulation are the groups most vulnerable to change, and so they have relatively higher marginal benefits from access to higher education. This emphasizes the need for inclusive and sustainable policy approaches that take into account the specific needs and characteristics of each population group. Understanding this variability is an important first step in designing more effective and equitable policies that will benefit entire populations, especially those most vulnerable and affected by policy changes.

This analysis highlights the possible heterogeneity of the impact of deregulation of the university system depending on individual socio-economic characteristics. However, the analysis results reveal an uneven distribution of the impact of deregulation among socio-economic groups. Based on differences in gender, race, and quintiles of per capita family income, the impact of deregulation shows significant variations. First, the impact of deregulation on years of education tends to be greater for women than men, indicating that women may respond positively to more flexible access to higher education. Second, racial differences in the impact of deregulation necessitate deeper understanding. Third, the effect of year of birth on education tends to be greater in higher per capita family income groups. This shows that access to higher education can further increase the length of education for more established economic groups. Thus, a better understanding of the heterogeneity of the impact of deregulation can help design more inclusive and sustainable education policies.

We have estimated results for men, women, indigenous peoples, and non-indigenous people. First, the estimates show that the impact of education on wages is greater for women than for men; women with a university education have an average salary premium of 80 percentage points higher compared to women with a secondary education, while the salary premium for men is 50 percentage points higher. On the other hand, the impact of university education on the likelihood of informality tends to be greater for men than for women. Second, the estimates also show that the impact of years of university education on wages is greater for women than for men. For each additional year of education, women have an average salary premium of 20 percentage points higher

compared to women with secondary education, while the salary premium for men is 10 percentage points. This shows that the labor market values women's qualifications more. Third, estimates based on worker race only yield significant results for wages and working conditions for individuals defined as non-indigenous. In this group, for each additional year of study at the university, there is a salary. Despite the positive and relatively larger impact on indigenous groups, the estimated coefficient lacks statistical significance, possibly due to the limited number of observations for this group in the used sample.

The research results display estimation results based on quintiles of family per capita income. Estimates show that the impact of education on wages and labor informality is statistically significant for individuals in the highest income quintile. University-educated individuals in this quintile have an average salary premium that is 80 percentage points higher than individuals with secondary education. Meanwhile, individuals in the highest income quintile who have a university education have a lower probability of experiencing informality compared to individuals with a secondary education. Based on the estimation results, the effect of years of education on wages and labor informality is statistically significant for individuals in the highest income quintile. In this quintile, for each additional year of university study, wages increase by 20 percentage points, while the probability of labor informality decreases by 20 percentage points.

The validity of estimates depends largely on the identification assumptions used in the analysis. This research employs the identification assumption that a person's year of birth enhances their access to the university system. We made this assumption to compare the impact of higher education between individuals who have completed their university education and those who have only completed their high school education. However, there are several weaknesses in these identification assumptions that may affect the validity of the estimates. One is that the instruments used in the analysis do not meet the properties necessary to interpret the estimated impacts as causal effects. The first stage of the F test shows a low value, indicating that the instrument is weak. Furthermore, the instrument over-identification test results reveal the possibility of rejecting the null hypothesis at 5% significance, a sign of a problem with the instrument. As a result, the impact of education on employment outcomes estimated in all sham experiments will be biased due to the presence of weak instruments. Therefore, it is necessary to review the instruments used in the analysis to ensure the validity of the estimates.

4. Conclusion

The vast majority of individuals accessing university studies, in the absence of deregulation, would likely only pursue secondary education. This deregulation primarily impacts individuals. This study uses the year of birth cohort as an exogenous characteristic to implement the instrumental variable strategy. This makes it possible to estimate the causal impact of university education on several employment outcomes, especially wages and labor informality. An admitted university estimates that each year of study will increase the salary by 15 percentage points. We estimate the cumulative impact of access to university studies at 70 percentage points. However, the effect of university education on wages turns out to be heterogeneous, depending on individual socio-economic characteristics. The effect tends to be higher in women and in individuals in the highest family income quintile. We found evidence that aligns with other international research regarding the salary premium of university education and its impact on human capital. This study also uses instrumental variables to estimate wage returns from higher education. This study complements previous empirical evidence on the case by considering the impact of higher education on workers' working conditions, especially in terms of employment informality. The results show that for each year of university study, the probability of informality in employment decreases by 15 percentage points, notably reducing the probability of not having an employment contract by 15 percentage points. However, we found no significant impact on the likelihood of not having affiliation with a pension fund, suggesting the existence of a structural dimension of informality in the labor market that may be independent of workers' education level.

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