



Title	The Impact of University Reform on Research Performance : Evidence from the Partial Privatization (Corporatization) of Japanese National Universities
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Citation	地域経済経営ネットワーク研究センター年報, 6, 75-77
Issue Date	2017-03-29
Doc URL	http://hdl.handle.net/2115/66541
Type	bulletin (article)
File Information	071Kikuchi.pdf



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The Impact of University Reform on Research Performance: Evidence from the Partial Privatization (Corporatization) of Japanese National Universities

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As articulated in economic growth theory, the accumulation of knowledge can be the essential sources of long-term economic growth. Focusing on the role carried out by universities in knowledge production, this research empirically analyzes the effects that university governance has on research activities by university researchers. More specifically, this research estimates the causal effects of university governance on their research activity through the analysis of the transformation of Japanese national universities into “national university corporation”, a



juridical public body separated from central government. The Corporatization (or Partial Privatization) of the Japanese national universities since 2004 is characterized as exogenous source of promoting additive competitive environments within national universities, improving accountability, and expanding a range of some aspects of autonomous function of national universities.

Some detailed estimation results are attained through Difference-in-difference (DID) estimations using private universities as the control group that had not affected by the corporatization of national universities bringing about a significantly positive impact for engineering and economics publication activity in national universities. However, research output in medical science experienced a pronounced decrease in national universities.

To detect the impact of partial privatization on national university research outcomes, I use difference-in-difference estimators in a linear model. The main specification of this fixed-effect model is:

$$\text{ResearchOutcome}_{it} = \beta(\text{national}_i \times \text{post2004}_t) + \lambda_t + \theta_i + \varepsilon_{it}$$

where i indicates university; t indicates year; $\text{ResearchOutcome}_{it}$ is the output variable based on articles contained in the web database “ISI Web of Science”; $\text{national}_i \times \text{post2004}_t$ is a dummy variable that takes the value of one if the university i is national and the observation at year t is after 2004 and zero otherwise; λ_t is the year dummy capturing effects common to Japanese universities; θ_i represents all time-invariant university-specific characteristics for university i , and ε_{it} represents university-specific temporal shocks.

I assume that in the absence of partial privatization, national universities and private universities follow similar research trends. Consequently, β detects whether the reform impacted the research outcome of the national university. I check the plausibility of this assumption in the robustness check. Moreover, to control for potential heteroscedasticity and serial correlation, standard errors are clustered at the university level (Bertrand et al. (2004)).

These estimation strategies are adequate, first, because all national universities were partially privatized uniformly

in 2004 without selection. Second, these specifications can eliminate the common macro shock in the research trend in both national and private universities by common year effects. For instance, in the field of medical science, all university hospitals in Japan experienced a system change in 2004 (shin rinsho kenshu seido) that reduced the number of medical students with whom university hospitals collaborated by obligating the students to work as clinicians for two years. This might have negatively affected the research activity of university hospitals because it decreased the labor force. There is a danger, therefore, that an econometrician may capture the effect instead of the partial privatization. However, my approach avoids such potential threats to the identification by capturing the common macro shock via year effects. Third, these fixed effect strategies can eliminate unobservable university-specific components and alleviate the heterogeneity of each university, such as scale and differences in fundamentals between national and private universities.

Table 1 reports the baseline estimates for my basic specifications in equation above with standard errors clustered at the university level. The first and second columns report the results for the fields of engineering and economics. These two coefficients of the interaction $\text{national}_i \times \text{post2004}_i$ indicate that, after 2004, the research output was significantly higher for national universities that experienced partial privatization.

Table 1: The Effect of Partial Privatization on university (DID)

	Engineering	Economics	Medical science
National \times post-2004	5.491*** (1.869)	0.514** (0.241)	-65.61*** (17.67)
Observations	2,893	1,606	880
R-squared	0.075	0.077	0.228
Number of universities	263	146	80
Outcome mean of national university (1999-2003)	24.14	1.18	672.25
Effect in %	22.7%	43.6%	-9.8%

Note: Standard errors clustered at the university level are reported in parentheses. ***, ** and * represent statistical significance at the 1%, 5%, and 10% levels, respectively. Other control variables, which are not reported in this table, incorporate a full suite of year dummy and regional dummy \times year dummy.

Moreover, analyses of these fields of study that divided universities into less research-intensive universities and more research-intensive universities found that the more research-intensive universities had significantly robust positive effects, whereas significant effects couldn't be seen in the less research-intensive universities. The analyses largely indicated that the transformation into independent institutions resulted in the advancement of domestic competition and resources being concentrated on universities with superior research capabilities in line with the drastic decrease in subsidies for operations. Furthermore, the analyses suggest that the effect coincided with intensified efforts to acquire competitive-type research funding also induced by the reform. These results suggest the possibility that competitive research resources (perhaps more efficiently) have become concentrated towards universities that are achieving superior research results, and indicates a positive effect for research-intensive universities and no significant effect for less research-intensive universities.

In the third column of Table 1, I use the medical science field as output. In contrast to the other results, the impact in university hospital is significantly negative. This result is consistent with the expectation that corporatization, which encourages income-generating activity, results in a decrease in the research output of university hospitals. This finding reflects the special characteristics of university hospitals that render them the main producers of research output and the greatest national university revenue earners from the provision of clinical services.

This study contributes to a recent strand of literature that investigates the relation between university governance or

managerial factors and performance. Aghion, Dewatripont, Hoxby, Mas-Colell, and Sapir (2010) attempts to empirically show the importance of autonomy and competition among university. However, their findings are incomplete mainly due to the endogeneity of autonomous and competitive status of universities. McCormack et al. (2014) showed some association between the higher management index and superior performance for both research and teaching in the UK without claiming causality. Quentin (2014) also tried to capture the determinants of research production at top US universities, but the results also suffer from an endogenous problem. The prominent features of my study compared to these studies are that the results provide a causal relationship between university governance with research outcome and thereby provide direct policy-relevant implications of university reform.

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