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Does the institutional governance model of universities matter for third mission performance? An analysis on spinoff and patenting activities in the Italian context

Davide Donina

University of Bergamo



Co-authors: *Alice Civera, Michele Meoli*

Research Project - Higher Education Governance Reforms: National and Institutional Policy Translation

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4. Donina, D., Hasanefendic, S., 2019. Higher Education Institutional Governance Reforms in the Netherlands, Portugal, and Italy: A Policy Translation Perspective Addressing Homogeneous/Heterogeneous Dilemma, *Higher Education Quarterly* 73(1), 29-44.
5. Donina, D., Paleari, S., forthcoming. New Public Management: Global reform scripts or conceptual stretching? Analysis of University Governance Structures in the Napoleonic Administrative Tradition, *Higher Education*, doi: 10.1007/s10734-018-0338-y

Research Project - Academic spinoff

1. Meoli, M., Paleari, S., Vismara, S., 2013. Completing the technology transfer process: M&As of science-based IPOs. *Small Business Economics* 40(2), 227-248.
2. Horta, H., Meoli, M., Vismara, S., 2016. Skilled unemployment and the creation of academic spin-offs: a recession-push hypothesis. *The Journal of Technology Transfer* 41(4), 798-817.
3. Meoli, M., Paleari, S., Vismara, S., 2019. The governance of universities and the establishment of academic spin-offs. *Small Business Economics* 52(2), 485–504.
4. Civera, A., Meoli, M., Vismara, S., forthcoming. Do academic spinoffs internationalize?. *The Journal of Technology Transfer*, doi: 10.1007/s10961-018-9683-3
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Introduction: Higher Education Reforms

- University governance has been at the centre of the global higher education (HE) reform agenda aiming to enhance the performance of HE institutions
 - Common ground for the reforms was the idea that the decision-making process within universities were ineffective, inefficient, and over-bureaucratized (Enders et al., 2011)
- OECD (2003; 2007; Santiago et al., 2008) argued that the collegial governance decision-making model (Clark, 1983) was one of the main reasons for ineffectiveness in continental Europe
 - Assume an instrumental perspective regarding the role of university governing bodies

Research gaps

- Many studies analyzed policy changes to formal arrangements of central university governance structures in different contexts
- Only few studies examined their impact on institutional performance
 - Provide *inconsistent and contradictory empirical evidence* about the relationship between *institutional governance* and *performance of universities* (e.g. McCormick and Meiners, 1989; Brown, 2001; Frolich et al., forthcoming)
- Concepts of performance in the field of HE is multi-level, multi-faceted, and multi-dimensional (Brown, 2001; Rabovsky, 2014)
 - Well-defined and unanimously shared measures of the performance of universities are still lacking (Brown, 2001)
 - Focus just on some aspects of performance
 - ✓ Teaching (e.g. McCormick and Meiners, 1989; Brown, 2001)
 - ✓ Research (e.g. Edgar and Geare, 2013)

Research aim

- To assess whether the governance structures affect university performance
 - Specifically we focus on the so-called third mission performance
 - ✓ Usually overlooked
 - ✓ Prompted by policy-makers (Perkmann et al., 2013)

- Context of analysis:
 - Italian public universities since 2012
 - ✓ Implementation of reform with respect to university was completed
 - Particularly apt two main types of governance models have been adopted following the enforcement of the governance reform

Research contributions

- Previous studies (Brown, 2001; Meoli et al., 2019) suggest that research should *broaden the spectrum of analysis* to embrace further aspects of:
 - Governance
 - Performance
- We address these gaps by considering:
 - Types of governance model for the Administrative Board in Italian public university
 - *Assess third mission performance by considering two performance indicators*
 - ✓ Spinoff establishment
 - ✓ Patents

Literature review: HE institutional governance reform

- Common changes
 - Centralization of decision-making powers
 - Boards are pivotal in influencing and controlling the strategic process and key priorities of the institutions (Dalton et al. 1998)
 - ✓ Now involved in decisions regarding structural, developmental, strategic planning as well as budgetary allocation (Kretek et al. 2013; Donina and Paleari forthcoming)

- Divergences
 - Global governance templates have been translated and adapted in hybrid and heterogeneous ways (Christensen et al., 2014; Donina and Hasanefendic, 2019; Donina and Paleari, forthcoming)

Context of analysis: Italy - Napoleonic administrative tradition

- Unfavourable environment for NPM model and mechanisms (Bleiklie 2014)
 - Often regarded as 'latecomers' to NPM-inspired reform (Kuhlmann 2010)
 - Underrepresented in comparative administrative research (Ongaro 2010)
 - Dissimilarities emerge when HE reforms are compared with the NPM-driven ideal (Amaral et al. 2013; Musselin and Teixeira 2014; Donina et al. 2015; forthcoming; Capano et al. 2016)

Context of analysis: Italian public universities

- Comprehensive reform of HE governance (Law 240/2010 or Gelmini reform) was approved in December 2010
 - *Institutional governance structures* present many specificities with respect to NPM global reform scripts (Donina and Paleari forthcoming)
 - High discretion for the interpretation of certain provisions
 - ✓ No detailed regulation is openly prescribed regarding the selection mechanisms of board members (except Rector and students, who are elected by law)
 - ✓ Variance in the methods of selection of internal board members
 - Two main types of governance models have been adopted in Italian public universities (Donina et al. 2015) – our main independent variable
 - ✓ *Stakeholder model*
 - ✓ *Democratic model*

HE institutional governance reform: Italian (and Southern Europe) specificities

NPM: Decision-making power	Italy	Portugal
Verticalization of governing bodies	Board member appointment (from Rector) in some universities	Middle management appointment (from Rector) in some universities
Introduction/ Empowerment univ. boards' decision-making powers	Yes	Yes , with very important powers (i.e. elect and can dismiss the rector)
Weakening and subordination of academic senates	Partially. Maintain key role in academic matters and can propose a motion of no confidence to the rector	Yes. Not compulsory and eventually just with advisory role
Gain independent legal status (foundational model)	No state universities adopted	5 of 14 state universities adopted
NPM: Rector	Italy	Portugal
Replacement of election with appointment	Elected from university community (absolute majority of votes to academic staff)	Elected from general council (absolute majority of votes to academic staff representatives)
Professionalization of HE leadership	No. Elected for a fixed-term (maximum 6 years) from among university's current academic body	No. Elected for a fixed-term (maximum 8 years) from among university's current academic body
NPM: University Board	Italy	Portugal
Reduction in board size	Yes, maximum size: 11 members (average: 10.0)	Yes, maximum size: 35 members (average: 26.2)
Lay members: majoritarian participation	Minority participation (except for one univ.) (average: 25.8%)	Minority participation (average: 27.9%)

Source: Donina and Paleari (forthcoming)

NPM: Global reform scripts or conceptual stretching?

- Similarities in several aspects that *differ from the NPM-driven ideal*
 - NPM-driven policy instruments have only partially been finalized
 - ✓ Influenced by initial preconditions
 - Combined policy instruments of bureaucratic steering with elements of NPM
 - Individual universities maintained their historical characteristics
 - ✓ Hybrid reform outcomes
 - There has not been a paradigm shift
- **Neo-Weberian model** matches most of the identified features
 - ✓ Election of the Rector
 - ✓ Restrictions in the shift of senior personnel from business to HE leadership positions
 - ✓ Minority presence of lay members
 - ✓ Bottom-up process to select middle management and board members

Neo-Weberian Public Management Reform Narrative

- Dissimilar predominant coordination mechanisms

	New Public Management	Network Governance	Neo-Weberianism
External regulation	Low	Medium	High
External guidance	High	High	Medium
Competition	High	Low	Low
Academic self-governance	Low	Medium	High
Managerial self-governance	High	Medium	Low

Source: Donina et al. 2015

Literature review: Institutional Governance-Performance (1/2)

- Paucity of studies that assess the relation between size, composition, and rules for board member selection and university performance
 - Frolich et al. (forthcoming) relate the *institutional governance models* of Norwegian HEIs to their *strategic decision-making processes*
 - ✓ Institutional governance structures have little impact on design and organization of the strategic decisions
 - ✓ Not attempt to assess the link between either the institutional governance model or outcomes of the strategic processes to institutional performance

Literature review: Institutional Governance-Performance (2/2)

- Studies examined the relationship between *academic staff participation in decision-making* and *university performance*
 - ✓ McCormick and Meiners (1989)
 - Active academic staff participation in university governance is ineffective
 - ✓ University performance suffers as academic staff's control over decision-making increases
 - ✓ Brown (2001)
 - Optimal level of academic staff participation depends on the type of decisions. Greater academic control over decisions concerning:
 - ✓ Academic issues leads to better performance
 - ✓ Organizational management is associated with lower performance

Performance indicators employed

- *Average scholastic aptitude test scores* of the incoming freshmen in American universities and colleges (both McCormick and Meiners, 1989 and Brown, 2001)
- *Overall university rating* as calculated by Gourman (1967)
- *Average faculty salary*
 - ✓ Scholars (e.g. Solmon, 1975; Dolan et al., 1985) stress that it is a determinant of the performance rather than a performance in itself
- These performance indicators are controversial (and, in the best option, partial)

Literature review: Institutional Governance-Third Mission Performance

- Many university characteristics have already been studied as potential factors that affect third mission performance (particularly technology transfer)
 - ✓ E.g. university public versus private ownership, academic quality, local high-tech demand conditions, license contract design, intellectual property policies, characteristics of university technology transfer offices, governance of the spinoff, etc.
- To the best of our knowledge, only two studies addressed the relationship between specific aspects of institutional leadership/governance and third mission performance
 - Rector background (Civera et al., forthcoming)
 - Lay members' presence and experiential capital (Meoli et al., 2019)
 - ✓ In the Italian context, lay member presence is restricted to the minimum allowed by Law 240/2010 in almost all universities (on average 25.8%)
- Third mission performance indicator:
 - Focused just on one specific aspect: spinoff establishment

- Italian public universities. From the whole population, we excluded:
 - 30 Italian non-state universities
 - 5 small state universities specialized in doctoral training
- Period of analysis: from 2012 to 2015
 - Period of observation departs from 2012 because the implementation of internal re-organization by Italian universities took more than one year
- Our panel data rely on 244 university-year observations, covering 61 universities observed for 4 years (2012-2015)

Research design: *Estimation method*

- **Ordinary least square (OLS)** regression model

- We prefer the OLS regression model with respect to the methods that use frontier analysis (i.e. SFE or DEA) since:
 - Our analysis aims to estimate the *direct effect* of institutional governance model on the establishment of academic spinoffs and registered patents
 - It has been *largely employed in the literature* (e.g. Caldera and Debande, 2010)
 - Two methods typically used to estimate the *best practice frontier* have well-known *drawbacks* (Van Biesebroeck, 2007)
 - ✓ SFE is requires strong assumptions about functional form of production function
 - ✓ DEA is deterministic, thus sensitive to measurement errors and outliers

Dependent variables

- In line with previous research (e.g. Chukumba and Jensen, 2005; Lach and Schankerman, 2008; Civera et al., forthcoming; Meoli et al., 2019), we consider as indicators of third mission performance:

- Spinoffs established
- Patents registered

	Spin-off		Patents	
2012	139	36.2%	2,640	21.7%
2013	102	26.6%	2,888	23.8%
2014	89	23.2%	3,515	29.0%
2015	54	14.1%	3,096	25.5%
Total	384		12,139	
Nord ovest	92	24.0%	3,716	30.6%
Nord est	66	17.2%	1,940	16.0%
Centro	115	29.9%	1,409	11.6%
Sud	82	21.4%	2,162	17.8%
Isole	29	7.6%	2,912	24.0%
Total	384		12,139	

Main independent variable (dummy) 1/2

- Donina et al. (2015) analysed the reform implementation and classified the Administrative board of Italian public universities:
 - By coding the method of selection of internal board members as defined in the statute of every Italian public university after their revision
 - By relying on Cornforth's (2003) taxonomy of the board in public and no-profit organizations

Board Model	Board Role	Board members
Compliance	Compliance/conformance: safeguard owners' interests, oversee management, check compliance	Owners' representatives
Partnership	Improve performance: add value to top decisions/strategy partner/support management	Experts
Co-option	Boundary spanning: secure resources, maintain stakeholder relations, bring external perspective	Chosen for influence with the key stakeholders
Democratic	Political: represent constituents/members, reconcile conflicts, make policy, control executive	Elected representatives of constituents/members
Stakeholder	Balancing stakeholder needs, make policy/strategy, control management	Stakeholder representative: elected or appointed by stakeholder groups
'Rubber-stamp'	Largely symbolic: ratify decisions, give legitimacy, managers have real power	Owners' representatives

Source: Donina and Paleari (forthcoming)

Main independent variable (dummy) 2/2

- Identified two main types of governance models:
 - *Stakeholder model*: wherein internal board members are appointed (by either the Rector, the Academic Senate, or both)
 - ✓ 48 universities
 - *Democratic model*: wherein all the internal board members are elected
 - ✓ 13 universities

Democratic	Stakeholder	
Firenze	Bari	Napoli Parthenope
Genova	Bari Politecnico	Napoli L'Orientale
Marche Politecnica	Basilicata	Padova
Messina	Bergamo	Pavia
Milano Politecnico	Bologna	Perugia
Palermo	Brescia	Piemonte Orientale
Parma	Cagliari	Roma Foro Italico
Pisa	Calabria	Roma La Sapienza
Reggio Calabria Mediterranea	Camerino	Roma Tor Vergata
Roma Tre	Cassino	Salento
Sannio	Catania	Salerno
Torino Politecnico	Catanzaro Magna Graecia	Sassari
Trieste	Chieti Pescara	Siena
	Ferrara	Teramo
	Foggia	Torino
	Insubria	Trento
	L'Aquila	Tuscia
	Macerata	Udine
	Milano	Urbino
	Milano Bicocca	Venezia Ca' Foscari
	Modena Reggio Emilia	Venezia IUAV
	Molise	Verona
	Napoli Federico II	Perugia per Stranieri
	Napoli Vanvitelli	Siena per Stranieri

Variables and Data sources

Variables	Definition	Source
Dependent variable		
University Spin-offs	Number of spinoffs per university per year (<i>Logarithms are used in regressions</i>)	Spinoff Italy
University Patents	Number of patents granted per university per year (<i>Logarithms are used in regressions</i>)	Scopus
Independent variables		
University Governance Model	Dummy variable equal to 1 if the university adopts the <i>stakeholder</i> model, 0 if the university adopts the <i>democratic</i> model according to Donina et al. (2015) and Cornforth (2003)	University statute
University-level control variables		
Lay members	Share of lay members in the Administrative Board	University statute
University size	Number of academic staff (full professors, associate professors, and researchers) of the university at 31 December of each year (<i>Logarithms are used in regressions</i>)	Ustat-MIUR
Students/Faculty Ratio	Ratio between the number of students and the academic staff of the university	Ustat-MIUR
Publications per academic staff	Ratio between the total number of papers registered on Scopus and the academic staff of a university in a certain year	Scopus, Ustat-MIUR
Citations per publication	Ratio between the total number of citations registered on Scopus and the academic staff of a university in a certain year	Scopus
Previous Spinoff Experience	Cumulative number of spinoffs until the observation year (<i>Logarithms are used in regressions</i>)	Spinoff Italy
TTO size	Number of employees in TTOs (<i>Logarithms are used in regressions</i>)	CRUI
Medicine	Dummy variable equal to 1 for universities comprising medical discipline	Each university website
Engineering	Dummy variable equal to 1 for universities comprising engineering discipline	Each university website
Context-level control variables		
Regional unemployment rate	Rate of unemployment in the region (NUTS2-classification level)	ISTAT
Regional research and development (R&D) expenditure	Regional R&D expenditure with respect to regional GDP (NUTS2-classification level)	ISTAT
Year	Dummy variable related to the year	

Descriptive statistics

Variable	Democratic					Stakeholder					Total				
	Obs	Mean	Std.Dev	Min	Max	Obs	Mean	Std.Dev	Min	Max	Obs	Mean	Std.Dev	Min	Max
Number of Spinoff	52	2.365	2.409	0	11	192	1.359	1.722	0	9	244	1.574	1.928	0	11
Number of Patents	52	84.327	123.285	0	481	192	40.385	75.114	0	374	244	49.750	89.162	0	481
Share of lay members	52	0.242	0.047	0.2	0.36	192	0.261	0.090	0.2	0.78	244	0.257	0.083	0.2	0.78
Academic staff	52	1,003.8	487.4	195	1,851	192	819.2	770.8	39	4,004	244	858.5	722.9	39	4,004
Students per academic staff	52	29.4	4.6	22.0	41.4	192	30.4	7.7	16.1	54.3	244	30.2	7.1	16.1	54.3
Publications per professor	52	1.282	0.326	0.5878	1.761	192	1.156	0.481	0	2.090	244	1.183	0.455	0	2.090
Citations per publication	52	26.800	5.853	16.8	41.9	190	24.638	8.447	0	38.1	242	25.102	8.000	0	41.9
TTO Size	52	3.538	3.398	0	13	192	3.750	2.969	0	12	244	3.705	3.060	0	13
Spinoff previous experience	52	4.154	4.517	0	19	192	2.573	3.306	0	16	244	2.910	3.646	0	19
Engineering	52	1	0	1	1	192	0.542	0.500	0	1	244	0.639	0.481	0	1
Medicine	52	0.615	0.491	0	1	192	0.604	0.490	0	1	244	0.607	0.490	0	1
Regional Unemployment	52	13.010	5.733	6.8	23.7	192	12.759	5.208	6.2	23.7	244	12.812	5.313	6.2	23.7
Regional R&D expenditure	52	1.290	0.377	0.518	2.185	189	1.199	0.376	0.448	2.185	241	1.219	0.377	0.448	2.185

Empirical results

Variables \ Number of	(1) Spinoff (logarithm)	(2) Patents (logarithm)
Governance model (Stakeholder)	-0.249**	-0.949*
Share of lay members	0.491	-0.733
Academic staff (logarithm)	0.243***	1.217***
Students per academic staff	-0.00592	-0.00986
Publications per professor	0.0189	0.0270
Citations per publication	0.0142**	-0.00421
TTO Size (logarithm)	0.118**	0.396
Spinoff previous experience	0.124*	
Number of Patents (logarithm)	-0.0319	
Engineering	-0.0926	-0.795
Medicine	-0.0969	0.607
Regional Unemployment	-0.00742	-0.0346
Regional R&D expenditure	-0.108	-0.373
year2013	-0.296**	0.209**
year2014	-0.420***	0.428***
year2015	-0.728***	0.284**
Constant	-0.479	-3.089
Observations	239	239
Number of Universities	61	61
R squared	0.5951	0.5040
Standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Findings (1/2)

- The *stakeholder governance model* is associated with a lower establishment of spinoff and lower patent activity with respect to the *democratic model*
 - Empirical evidence goes against the expectation that the election of board members is inefficient
- *Lay members in the board*: previous research suggested a weak empirical evidence that their presence in the board of Italian universities has positive effect on spin-off establishment (Meoli et al., 2019)
 - Our study does not provide empirical support to this hypothesis
- *Teaching and research load* are not significant
 - We cannot assert that teaching and research are neither substitute nor complement of the third mission
- *High-quality research*:
 - Leads to a greater probability to establish spinoffs
 - Not significantly correlated to patenting activity

Findings (2/2)

- *TTO size:*
 - An increase of size leads to an increase in the number of spinoffs established, while it does not significantly affect the number of registered patents
- *Previous experience in spinoff creation* positively affects the likelihood to establish new spinoffs
 - Both results are consistent with previous studies
- *Regional-level control variables* do not have a significant impact on either dependent variable

Contributions and Conclusions

- Contributions
 - Relate institutional governance model and university performance
 - ✓ Particularly, *third mission* performance (usually overlooked)
 - We examined multiple indicators of institutional governance and third mission performance
 - ✓ Governance model for the Administrative Board & Lay member
 - ✓ Not only spinoff, but also patenting activity
- Main results
 - Institutional governance model of university matters for third mission performance
 - Contrast the expectation of supra-national organizations that support the stakeholder governance model as the benchmark
 - ✓ Policy implication: democratic decision-making model and election of board members in the university board may not have those negative implications that are usually stressed by policy-makers to push forward institutional governance reform

Limitations and future development

- Our study does not support that the share of lay member in university board significantly affects third mission performance (as usually taken for granted)
 - Italian (and Southern Europe) specificity: Lay member are the minority in the board
 - ✓ Comparative studies with empirical contexts with greater share of lay members in the university board and multi-national samples need to prove this finding in order to generalize them

- Number of spin-offs established and patents registered may not be a well-round indicator of good performance (e.g. when spin-off survival is low):
 - It is advisable to complement the information on the number of spin-offs with information on spin-off growth and rate of survival

Thanks for your attention



Davide Donina, Post-doc Research Fellow

davide.donina@unibg.it