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The Effect of Mission Statement Content and Economic Complexity on Innovation and Research in Organizations

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Universidad del
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Abstract

The mission statement (MS) is the most used organizational strategic planning tool worldwide. The relationship between an organization's MS and its financial performance has been shown to be significantly positive, albeit small. However, the relationship between the MS and the macroeconomic environment and organizational innovation has not been investigated. We implemented a structural equation modeling using the SCImago Institutional Ranking (SIR) as a global baseline sample and assessment of organizational research and innovation (RandI), an automated MS content analysis, and the Economic Complexity Index (ECI) as a comprehensive macroeconomic environment measure. We found that the median performance of organizations that do not report an MS is significantly higher than that of reporting organizations and that a path dependence driven by the State's long-term view and investment is a better explanatory variable for organizational RandI performance than the MS construct or the intermediate-term macroeconomic environment.

Keywords

Economic complexity; innovation; mission statement; performance; strategic planning.

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Introduction

“Make it clearer,” “add our shareholders,” “make it inspiring.” These suggestions could come from low-level employees as well as high-ranking executives when developing a mission statement (MS), the backbone of an organization’s strategic plan (Bart, 2001; Pearce II, 1982). The MS, as a strategic planning instrument, originated from scholars and institutions in the United States and gradually spread among other scholars and practitioners worldwide (Jones, 1960). The content of a MS should express at least four key concepts to the organization’s stakeholders: purpose (why the organization exists), values (what it believes in), standards and behaviors (the rules/norms that shape its operations), and strategy (the long-term planning and pathway for achieving its purpose) (Campbell, 1989).

Consider the content of two firms’ MS content: Google and Amgen. Google’s MS is “Organize the world’s information and make it universally accessible and useful.” Amgen’s MS is “To serve patients.” In terms of readability, a reader would need 16 years of education in American schools to comprehend Google’s MS but only 1.3 years to understand Amgen’s MS (Kincaid et al., 1975). While Google’s MS does not specifically mention its stakeholders, Amgen’s clearly does, namely, “patients.” The reader can quickly identify which MS is more inspirational and which is more ambitious in tone.

In the end, do internal discussions and debates regarding the content of the company’s MS and the costs it represents translate into superior organizational performance? Is superior organizational performance more related to a thriving industry or sector than to the MS content? (Robinson JR. & Pearce II, 1983). Strategic planning activities come with a cost; they represent an average of 25 000 person-days per billion dollars of an organization’s revenue (Pfeffer & Sutton, 2006).

These issues have produced a fertile research agenda since the 1980s. In a meta-study summarizing research published from 1987 to 2005, Desmidt et al. (2011) found a significant, albeit small, relationship between MSS and financial performance. Still, meta-studies’ results have not settled the debate regarding MSS and organizational performance. We note four limitations in these meta-studies: (1) sample restrictions, given that the mean sample of

organizations analyzed was 137 (Desmidt et al., 2011), (2) narrow focus on certain regions—most of the studies analyzed organizations located in a single country and in developed regions, (3) a focus on financial indicators or financial reporting for measuring organizational performance that excludes other crucial activities such as research and innovation (RandI), and (4) a lack of consideration of the effect of the macroeconomic environment on the content of the MS and on organizational performance.

Despite decades of research, fundamental aspects related to these issues remain unexplored. These gaps led us to formulate three research questions:

- RQ 1: Do organizations that publicly communicate their MS exhibit higher RandI performance than those that do not?
- RQ 2: Does the macroeconomic environment affect the MS content?
- RQ 3: Is an organization's RandI performance better explained by the content of the MS or the macroeconomic environment?

To answer these RQs, this study examined the effect of the macroeconomic environment on both MS content and RandI performance in multi-sector organizations in a cross-national sample. The sample spans organizations in Africa, Asia, Europe, Latin America and the Caribbean, North America, Oceania, and multinational organizations. These organizations belong to governmental, health, higher education, private, and independent sectors. Our sample size ($n=5,139$) is much larger than the sample in Desmidt et al. (2011) ($n=1,945$). This study also considered organizations that do not report their MS on their official website, allowing us to contrast organizational performance between MS reporting and non-reporting organizations. We considered the virtually unexplored issue of performance related to RandI outputs (e. g., research articles output and scientific and technological impact). It also introduced a factor related to the macroeconomic environment, namely economic complexity. Including the macroeconomic environment allowed us to disentangle RandI's dependence on external factors from an organization's internal ability to plan, design, deploy, and assess its actions. Furthermore, our MS analysis was comprehensive, analyzing readability features and tone (i. e., lexical diversity and polarity) via automated techniques.

The rest of this paper is organized as follows. Section 2 provides a review of the literature on the relationship between MS and performance. Section 3 discusses the methodology used to gather MSS, macroeconomic environment variables, content analysis properties, and the proposed structural equation modeling. Section 4 presents the results that are discussed in Section 5. Lastly, Section 6 offers our conclusions.

1. Literature Review

The interplay between formalized strategic planning, including the development of MSS, and organizational performance entail issues such as assessing risk by examining the environment, formulating goals and targets to be achieved, selecting distinctive competencies, determining the relationships between the firms' sub-units, deploying resources to carry out strategies, as well as controlling and monitoring those activities (Robinson JR. & Pearce II, 1983). MS content, in particular, and formalized strategic planning inputs, in general, must be communicated effectively to maximize their positive organizational impact and support internal leadership, activities, priorities, plans, and work assignments to add to excellence in organizational performance (Cochran & David, 1986; Pearce II, 1982; Pearce & David, 1987). This alignment summarizes the seminal paths of inquiry of the literature on MS and performance.

Studies on this topic focus on three main areas: comparative performance of firms that report an MS versus those that do not (i. e., non-reporting MS firms); specific characteristics of MS content and MS orientation, and the mediating effect of diverse factors (e. g., employees' commitment to the MS) on both financial (i. e., observable and self-reported) and non-financial performance. Most studies analyzed organizations, ranging from private firms to hospitals and universities, from developed countries in their local contexts.

1.1. Comparative Performance on Firms Reporting MS vs. Non-Reporting MS

Studies of the comparative performance of organizations with and without a MS have reported mixed results. Archer et al. (1998) found mixed but mostly negative support for the idea that organizations with a MS would perform better than organizations without one, based on a sample of large Canadian companies. In contrast, a study of Israeli organizations showed that firms with a MS have better performance than firms with no MS (Sheaffer et al., 2008); Alavi & Karami (2009) provide similar results for science parks in the UK. The latter study emphasized the relationship when either the CEOs/owners or human resources personnel were involved in developing the MS.

1.2. Characteristics of MS Content and MS Orientation, and the Mediating Effect of Diverse Factors

In a seminal study, Germain and Cooper (1990) argued that firms with a customer service-oriented MS are more likely to survey customers and monitor specific performance metrics (e. g., time per call, number of customers/inquiries, and on-time deliveries, among others). Regarding MS orientation, Atrill et al. (2005) found that among UK firms, MS of service sector organizations that had a shareholders' orientation showed a three-year stock return. In contrast, organizations in the non-service sector characterized by a MS with a *stakeholder* orientation showed a six-year stock return.

Studies focused on firms in developed countries (i. e., the US, Canada, Europe, and Japan) found a positive relationship between specific MS characteristics, namely, brevity, a mention of values/beliefs or purpose, and no mention of financial goals (Bart & Baetz, 1998) or phrases concerned with *employees*, *social responsibility*, and *values system* (Bartkus et al., 2006) with an increase in the percentage change in sales/profits and return on sales/assets.

Similarly, Jung and Pompper (2014) stated that the MS of the top 50 firms on the Fortune 500 list explicitly mentioned “accommodation” components such as a desired public image, concern for satisfying employees or for relationships, and “advocacy” components such as addressing corporate concerns for markets, profits, or products. Bart et al. (2001) considered the mediating effect of factors such as commitment to the MS and the degree to which an organization aligns its internal structure, policies, and procedures with it. Results showed a positive association between employee behavior and the aforementioned factors since employees have the most direct impact on financial performance (i. e., return on sales/assets).

Studies on firms located in developing countries have also focused on the relationship between specific characteristics of MS content and financial performance; MS with RandI-related words positively associated with superior performance concerning self-reported and non-financial variables in a sample of Chinese hightech firms (Zhang et al., 2015). In one of the most comprehensive samples reviewed—involving 3 034 Turkish SMES, Duygulu et al. (2016) stated that three MS components, namely, *survival*, *growth*, and *profit*, *philosophy and values*, and *public image* were related to firms'

performance (i. e., financial, market, production, and overall). In Latin America and Colombia, research has shown a positive relationship between MS readability and financial performance (Cortés-Sánchez & Rivera, 2019) defined in terms of return on assets and equity, as well as an effect on asset turnover when the MS promotes good asset management practices (i. e., use of positive language, orientation to financial goals, readability, and asset endowment) (Godoy-Bejarano & Tellez-Falla, 2017).

To our knowledge, the only study analyzing MS content and RandI performance (i. e., patents granted and spin-offs created) found a positive association between particular components or themes of MS, namely, customers, product offerings, geographic scope, investors, society, and performance among organizations in science parks in Spain (Berbegal-Mirabent et al., 2020).

1.3. MS Performance in the Non-Profit Sector

In a seminal study conducted in the non-profit sector of Canadian hospitals, Bart and Tabone (1999) affirmed that specific MS components such as distinctive competence/strengths, a unique identity, and a concern for satisfying patients showed a significantly positive correlation with satisfaction with the current MS. Research on not-for-profit health care organizations in Portugal demonstrated that the MS and self-reported performance relationships based on financial measures, such as gross income or growth in income, and on non-financial ones, such as quality of working environment or donations, are better understood with the mediating effect of organizational commitment (Macedo et al., 2016). Findings on microfinance organizations exhibited a strong coherence between MS focused on alleviating poverty, women's empowerment, and rural financial inclusion, as well as actual practices (Mersland et al., 2019). Social enterprises that mentioned customers and the product/service offered in their MS were likely to exhibit stronger economic performance (Berbegal-Mirabent et al., 2019).

Evidence from the higher education sector at the institutional level argued that the greater the number of specific sustainability related terms used in a university's MS (e. g., *sustainable*, *sustained*, *sustaining*, *socially responsible*, *social responsibility*, etcetera), the higher the probability that the university would have a high sustainability rating (Lopez & Martin,

2018). At the academic unit level, Palmer and Short (2008) found in a sample of business schools accredited by the Association to Advance Collegiate Schools of Business (AACSB) that MSS were incomprehensible. They found that the MS content was primarily related to business schools' operating budget performance per full-time faculty member or percent of full-time faculty with doctorate degrees.

The MS that seeks to build emotional commitment and has semantic attributes such as *activity* was positively associated with key performance metrics (e. g., financial sustainability, donations, number of volunteers) in not-for-profit and performing arts organizations (Pandey et al., 2017; Patel et al., 2015). In sum, MSS matter and 20 years of research on the topic show that they positively associate with (financial) performance (Desmidt et al., 2011).

Despite the research reviewed, there are several gaps in the literature to address, such as the need for a broader and more diversified sample, including macroeconomic factors that could influence both the MS construct and organizational performance, including metrics other than financial indicators and manual MS content analysis, and comparing different geographical regions and economic sectors.

2. Methodology

2.1. Data

2.1.1. Organizations' Baseline and RandI Performance

We used the SCImago Institutions Ranking (SIR) as a baseline database of diverse, research-focused organizations worldwide (SCImago, 2020). The SIR assesses more than 5000 institutions from the governmental, health, higher education, and private sectors, from over 130 countries, with at least 100 publications indexed in its bibliographic database, Scopus (SCImago, 2020). Institutions are ranked by a composite indicator with a maximum score of 100, which combines three sets of indicators:

- Research performance (output, international collaboration, normalized impact, high-quality publications, excellence, scientific leadership, leadership excellence, scientific talent pool); weight = 50 %
- Innovation outputs (number of patent applications, innovative knowledge or publications cited in patents, and technological impact or percentage of scientific publication output cited in patents); weight = 30 %
- Societal impact (websites and inbound links); weight = 20 %

Our baseline ranking surpasses the theoretical maximum of 249 ranks stated in recent meta-ranking research based on five organizational innovation worldwide rankings (Lichtenthaler, 2018).

2.1.2. Mission Statements

We collected MSS manually. For every institution listed in the SIR, five research assistants searched for the institution's MS on its official website between mid-2018 and mid-2019. Since other types of MS-related texts could contain at least one of the eight categories proposed by Pearce II (1982), we opted for broader inclusion criteria and searched for text with a similar purpose (e. g., *organization description, introduction, about us, our purpose, our values, our*

goals, our objective, what we do, etcetera) even if it was not labeled as the ms. English, Spanish, French, and Portuguese were the languages with the greatest number of MSS. The sample analyzed was restricted to MSS written in English due to the automated analysis tools’ limitations. Table 1 presents the summary of English-language texts gathered by region and sector. A total of 215877 words constituted the ms text corpus.

Table 1. Texts Gathered by Region and Sector

Region	Sector					Total
	Government	Health	Higher Education	Private	Others	
Africa	7	7	82			96
Asia	128	68	589	31	2	818
Europe	253	207	447	24	7	938
Europe-Asia	2		32	1		35
LATAM-CAR	33	21	136			190
North America	62	186	406	34	22	710
Oceania	6	34	32	1	3	76
MUL (Multinational institutions)			1	15		16
Total	491	523	1725	106	34	2879

Note: Multinational institutions (MUL) are organizations that cannot be attributed to any country. LATAM-CAR is Latin America and the Caribbean.
Source: the authors’ work, based on the organizations’ website.

2.1.3. Macroeconomic Factors

Indicators for studying the macroeconomic environment are extensive and diverse, from GDP per capita to the Rule of Law Index. We opted for a single index that significantly explains economic development compared to other indices, the Economic Complexity Index (ECI) (Hausmann et al., 2013). Economic complexity “is expressed in the composition of a country’s productive output and reflects the structures that emerge to hold and combine knowledge” (Hausmann et al., 2013, p. 18). The ECI ranks countries based on their export basket diversification and complexity, as countries with a higher diversity in productive know-how are able to produce both a diversified and sophisticated array of products (Hausmann et al., 2013). For instance, a country with a high ECI might produce and export both X-ray machines

and microchips; on the other hand, a country with a low ECI might produce and export coffee grains and oil.

Hausmann et al. (2013) compared the ECI with other measures of economic development, such as the six Worldwide Governance Indicators, human capital, and the Global Competitiveness Index. The ECI proved to be a much more reliable predictor of economic growth than the other indices (Hausmann et al., 2013). The ECI analyzes more than 120 countries; those with the highest and lowest ECI scores in 2017 were Japan (2.3) and Papua New Guinea (-2.0), respectively (OECD - The Observatory of Economic Complexity, 2017).

2.1.4. Software and Methods

We used the R package *Quanteda* (R Core Team, 2014; Benoit et al., 2020) for content analysis and the *AMOS* module for *SPSS* for our SEM (Byrne, 2010). Seminal studies (Germain & Cooper, 1990) and recent research (Berbegal-Mirabent et al., 2019) have used manual content analysis methods. The use of either manual or automated methods depends on the type and length of the material to be analyzed (Kondracki et al., 2002). Evidence shows that automated methods for content analysis avoid human biases (Nunez-Mir et al., 2016). However, we opted for a mixed method since it has been shown to have better results (Lewis et al., 2013). Specifically, we used manual browsing, capture, and MS classification from each company's website and an automated method for content analysis.

We proposed the MS construct based on three content characteristics: readability, lexical diversity, and polarity. Readability indices examine written materials' comprehensibility to avoid unnecessary complexity (Flesch, 1948; Gunning, 1969). Readability indices have been used in management and finance to study annual reports and their effect on analysts' earnings forecasts (Lehavy et al., 2011; Subramanian et al., 1993). One of the most used readability indexes is the Flesch-Kincaid Grade Level Score (FKGL), first used to test the readability of the US armed forces technical documents (Kincaid et al., 1975). The FKGL calculates the American school grade needed to comprehend a given text. For instance, The Huffington Post's website has an average grade level of about seven, meaning that individuals between 12-13 years old should easily understand it. The equation for the FKGL calculation is:

$$FKGL = .39 \left(\frac{\text{words}}{\text{sentences}} \right) + 118 \left(\frac{\text{syllables}}{\text{words}} \right) - 15.59 \quad (1)$$

As a first attempt to study MS tone, we used the sentiment dimensions proposed by Loughran and McDonald (2014), namely, negative, positive, uncertain, litigious, constraining, superfluous, and interesting tones. Preliminary results showed a fairly high lack of such tone characteristics in the MSS. A second tone-related analysis focused on two characteristics: lexical diversity and polarity. Lexical diversity refers to the variety of terms in a text (i. e., the number of different words in a given text); therefore, it is affected by text size. Tweedie and Baayen (1998) reviewed the most widely used lexical diversity measures to assess invariance versus text length. They split them into two groups: Yule's (1944) K and Z (Tweedie & Baayen, 1998). Both indices are theoretically constant in both groups and invariant to text length (Tweedie & Baayen, 1998). We chose K as our benchmark for its relative simplicity, compared to Z, and for its similarity to models based on type-token ratios (TTR).

Polarity refers to the intensity of the positive or negative feeling in a given text. A lexicon associates each word with a positive or negative feeling. We used the AFINN lexicon (Nielsen, 2011), which assigns a value ranging from -5, the most negative, to +5, the most positive, to each word. The MS polarity is the algebraic sum of the values assigned to each word. It indicates the positive (polarity>0) or negative (polarity<zero) sentiment conveyed by a given MS. Annex 7. 1. shows examples of extreme values of MSS in terms of readability, diversity, and polarity. Annexes 7. 2. and 7. 3. present the number of year-observations for the period 2014-2018, the relative position in the SIR, the descriptive statistics of the ECI, the FKGL, and both polarity and diversity, by regions and quintiles, respectively.

We used SEM to model the effects of the ECI on MS constructs and the SIR, and of MS constructs on the SIR. SEM is consistently used in strategy and management-related research and offers three main advantages for this study. First, it allows to define latent variables that capture relevant information from a set of observable variables in a model (Byrne, 2010). This allowed us to determine MSS and RandI performance as non-observable constructs and, consequently, to explain the observed variables, such as readability for MS and the SIR for RandI performance. Second, SEM can estimate structural

relationships where other methods cannot, given that it allows estimating regression coefficients and their significance, departing from co-variance matrices for observable variables (Shook et al., 2004). Third, SEM allows for co-variances between independent variables, a statistical property that captures correlations and interdependencies between independent variables frequently observed in the data (Byrne, 2010).

3. Results and Analysis

The MS is a strategic planning instrument used worldwide, albeit with regional differences. Sixty percent of the organizations listed in the SIR reported MS-related texts on their official websites. Regions such as North America (84%) and Oceania (75%) reported a higher proportion of organizations with public MS-related texts, while slightly less than half of Asian (48%) and European (49%) organizations.

Table 2 presents a comparison of the SIR between organizations that reported and those that did not report MS-related texts. Results showed that the median rank of non-reporting organizations is significantly higher (closer to 1) than reporting organizations.

Table 2. Comparison of Rankings between Reporting and Non-Reporting Organizations of MSs

Year	Ranking (Median)		Wilcoxon Test		F Test	
	Reporting	Non-reporting	W	P-Value	F stat.	P-value
2014	603	560	1.97E6	<0.001	143.53	<0.001
2015	602	561	2.08E6	<0.001	140.15	<0.001
2016	612	572	2.16E6	<0.001	131.44	<0.001
2017	609	565	2.55E6	<0.001	130.47	<0.001
2018	655	607	2.41E6	<0.001	122.53	<0.001

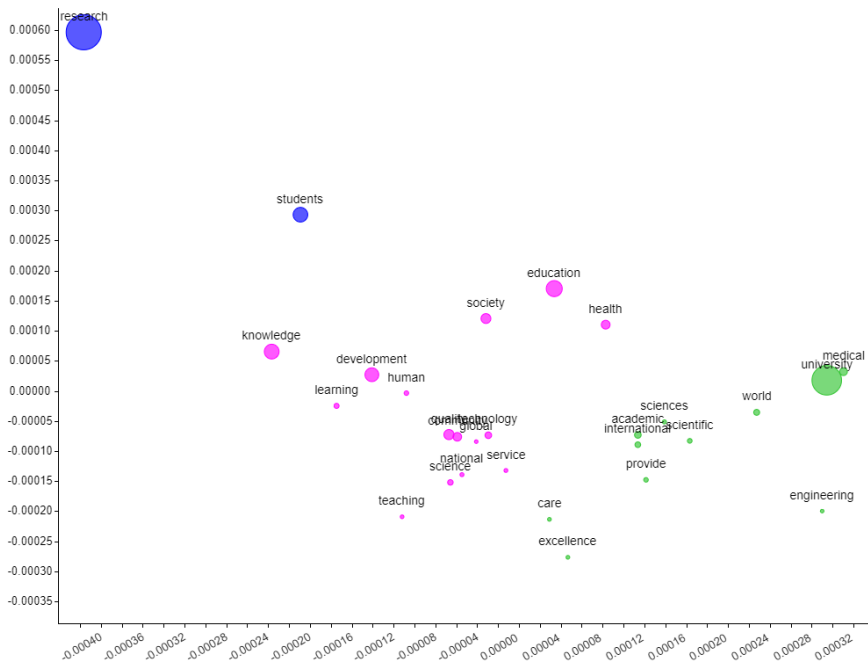
Notes: Comparison of rankings between organizations reporting an MS ($n=2879$) and non-reporting organizations ($n=2260$). Headers refer to the Wilcoxon rank-sum test (non-parametric test) with continuity correction and the one-way test (parametric test). Ranking refers to the relative position in the SCImago ranking (1=highest).

Source: Based on SCImago (2019) and organizations' websites.

Figure 1 shows a scatter plot of a resulting principal component analysis of a random sub-sample of 326 MSS (95% confidence; total variation explained by the X-axis = 68.24% and the Y-axis = 10.26%). The top 30 key terms were plotted and segmented into three groups, with size proportional to relative frequency. Comparing this analysis with the six key MS components analyzed by Pearce and David (1987), the key terms close to the origin (0,0) appear to be related to the principal products/services, market, and technology (e. g., service, technology, teaching, health). The terms in

the bottom-right quadrant are related to components of organizations' philosophy, public image, and self-concept (e. g., care, excellence, world, and international). Market- and stakeholder-related components are dispersed (e. g., students, society).

**Figure 1. Scatter plot of principal component analysis of a sub-sample of the MS.
Top-30 key terms are shown**

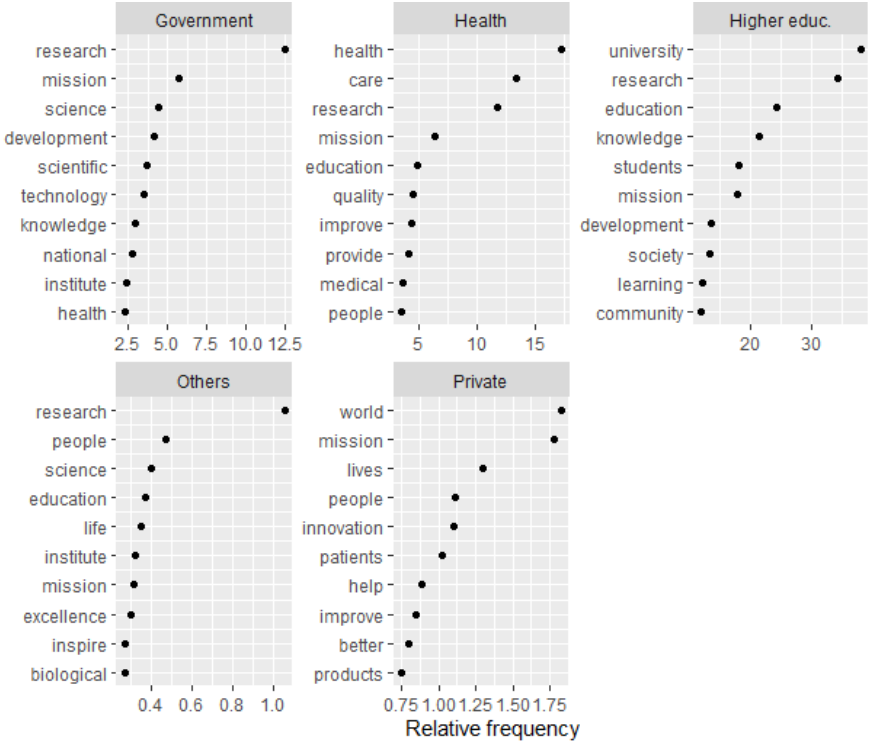


Source: Based on SCImago (2019) and organizations' websites, processed with Voyant-Tools (Sinclair and Geoffrey, 2012).

Figure 2 presents the relative frequency of the most common terms for each sector. *Research* is a priority in all, except for the private one. In the private sector, the top term is *world* related to reach/influence/incidence or in reference to a timeframe (e. g., tomorrow's *world*) through *innovation* and the development and distribution of *products*. For both the governmental and higher education sectors, *innovation* was not a priority; instead, *knowledge* was more important. It is interesting to note the lack of explicit use of terms related to individuals. Health, higher education, and private and other were the only sectors that mentioned terms related to individuals, namely *people*, *students*, *community*, *society*, or *patients*. There were similarities between

the health and higher education sectors in terms of references to *education* and *learning*. *Science* was a priority only in government and other institutions such as the Santa Fe Institute and the RAND Corporation. A plot that analyzed regions revealed additional insights.

Figure 2. Top-Ten Most Frequent Terms by Sector

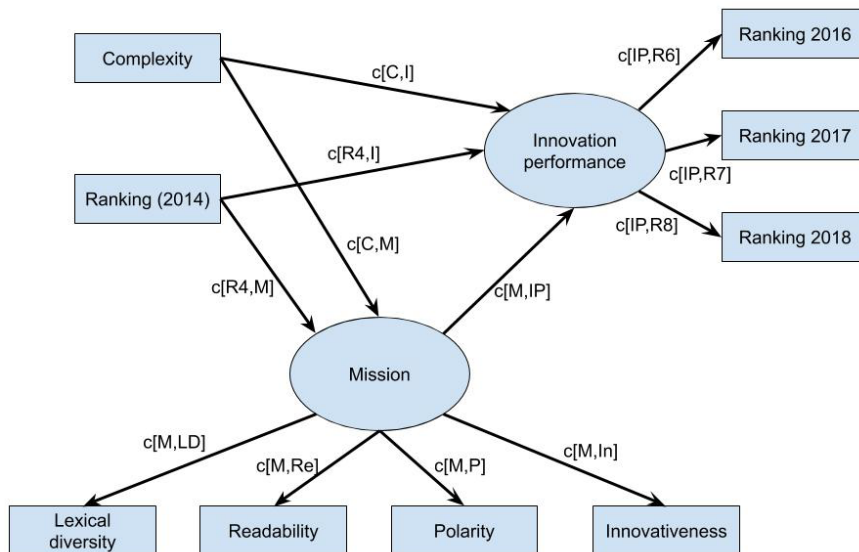


Source: Based on organizations' websites.

Figure 3 presents the proposed SEM that estimates the effects of MSS and factors related to the economic environment on RandI performance. Both MS and RandI performance are latent variables. The MS content is manifested via readability (i. e., FKGL) and tone (i. e., lexical diversity and polarity). Previous studies have used RandI performance measures over one to five years (Berbegal-Mirabent et al., 2019). We opted to use RandI performance measured by organizations' rankings in the SIR over three years (2016-2018). Other observable variables are innovativeness, mean ECI, and an organization's rank in 2014.

Innovativeness measures the degree of similarity between the sample's MS and the MS corpus of the organizations ranked in the top 5 % of the SIR in 2014. We proposed an innovativeness variable as the MS benchmark based on the MS of these top performers, as a proxy for the MS content of organizations that have shown superior performance which display particular characteristics —e. g., a *shareholders' orientation*, mentioning values/beliefs, purpose, no mention of financial goals, *employees*, *social responsibility*— (Atrill et al., 2005; Bart & Baetz, 1998; Bartkus et al., 2006). The coincidence level is between zero and one, where one indicates that a given organization MS could be written based on the MS corpus of the top 5 % organizations in the SIR. Complexity is the ECI average between 1995-2017 for 133 countries, which allowed considering the countries' macroeconomic environment path regarding their progress, stagnation, or decline for 22 years. We also considered the 2014 organizations' rank to integrate into the SIR analysis the organizations' persistence between 2014 and 2018.

Figure 3. Structural Equation Modeling



Source: Based on SCImago (2019) and organizations' websites, processed with R (R Core Team, 2014) package Quanteda (Benoit et al., 2018) for content analysis and the AMOS module for SPSS for SEM (Byrne, 2016; ibm Corp., 2017).

The content of MS is measured in terms of lexical diversity ($c[M, LD] = 0.984$, $p < 0.001$), readability ($c[M, Re] = 0.366$, $p = NA$), polarity ($c[M, P] = 0.610$, $p < 0.001$), and innovativeness ($c[M, In] = -0.294$, $p < 0.001$). MSS with the highest scores for content variables tend to have a lower coincidence level with the MS corpus of the top 5 % organizations of the SIR. The RandI performance variable is strongly related to the 2016-2018 SIR rankings, but that correlation tends to diminish over time. The organizations' 2014 rankings highly correlate to the ones in the period 2016 to 2018; thus, the 2014 ranking emerges as the strongest predictor of RandI performance in subsequent years ($c[R4, IP] = 0.999$, $p < 0.001$), which suggests a strong, persistent effect for the SIR rankings. Factors reflecting the economic environment (i. e., the average ECI over the period 1995-2017) and the effects of economic complexity on MS content ($c[C, M] = 0.037$, $p = 0.008$) and RandI performance ($c[C, IP] = 0.027$, $p < 0.001$) are rather small. The effect of MS on RandI performance ($c[M, IP] = -0.010$, $p = 0.166$) is not significant. This supports the negative relationship between MSS and innovativeness ($c[M, In] = -0.294$, $p < 0.001$), given that MSS manifest through higher lexical diversity and moderate polarity but do not fit the crucial innovation-oriented corpus of the MS of the top 5 % organizations in the SIR (see Annex 7. 4. for more details).

4. Discussion

4.1. Exploring the Most Frequent Terms

Including the term *mission* in the analysis was not an oversight by the authors. It was among the top ten terms in all sectors, and its high relative frequency was especially noticeable in the private sector. This supports organizations' need to express their self-awareness or self-concept, as in *our mission, the university's mission is; the organization's mission; we carry our mission* (Pearce II, 1982).

The *Longman Communication 3000* is a list of the 3000 most frequently used words out of the 390 million that comprise the *Longman Corpus Network* for spoken and written English (Longman Communication 3000, n. d.). Those 3000 words account for 0.0008% of the total corpus and for 86% of the entire written English language. Such findings are in line with Zipf's Law (Zipf, 1949). The most common terms, including 'research,' 'health,' 'university,' and 'world,' are among the top 1000 most written words in the English language. The two exceptions were 'excellence' and 'innovation.' A previous content analysis of universities' mss supports these findings (Cortés-Sánchez, 2018).

Results support the general orientation of mss in the private sector toward *innovation* (Zhang et al., 2015) and social responsibility (*lives*) (Bartkus et al., 2006). The priority for mentioning *products* is similar for social enterprises and private firms (Bebegal-Mirabent et al., 2019). No sector prioritized mentioning *shareholders, employees, values, survival, growth, or profits* (Atrill et al., 2005; Duygulu et al., 2016). Explicitly mentioning *patients/customers* or *employees* in the health sector was not consistent with previous studies (Bart & Tabone, 1999). Exploration tone characteristics using the sentiment dimensions proposed by Loughran and McDonald (2014) (i. e., negative, positive, interesting, etc.) did not reveal significant results within the ms corpus. Therefore, mss with those tones that are associated with organizational performance in developing countries and not-for-profit and performing arts entities are exceptions (Godoy-Bejarano & Tellez-Falla, 2017; Pandey et al., 2017; Patel et al., 2015). Based on these results, it appears that open discussions and efforts to make an inspiring, unique, and interesting ms have not produced the desired outcomes.

4.2. Do Organizations That Publicly Communicate Their MS Exhibit Higher RandI Performance Than Those That Do Not?

Results showed that the median RandI performance of non-reporting organizations is significantly higher than that of reporting organizations. Explanatory factors could be a function of regional differences in adopting MS and the existence of research dynamics and ecosystems in regions where the concept of MS was delayed in its development and implementation.

In the 1960s, Jones (1960) and Levitt (1960) established the seminal pathways for creating the framework and focus for MS composition. Firms then gradually adopted the idea and implemented MSS. To the best of our knowledge, the first empirical study of MS was published in the early 1980s (Pearce II, 1982), where the essential components of the MS were identified. A contemporaneous study that proposed a model for strategic planning in higher education included the MS as a “goal formulation” factor (Kotler & Murphy, 1981). Empirical studies in Europe (specifically, the Netherlands, Germany, and the United Kingdom) emerged in the early-2000s. Even though the Strategic Management Society and the *Strategic Management Journal* are based in London, 74% of papers published on MS have at least one author affiliated with a United States institution (Scopus, 2020). The time lapse between the initial proposals regarding MS concepts, their practical implementation, and the publication of empirical studies spanned at least 22 years in the United States and more in Asian and European countries.

With respect to the sector composition of organizations that do not report a MS, approximately 83% are in higher education and the government sectors (51.7% and 31.1%, respectively). Of the non-reporting organizations in higher education, a total of 77% are in Asia and Europe (44.3% and 32.7%, respectively). Moreover, 91.5% of non-reporting governmental organizations are located in Europe and Asia (69.2% and 22.2%, respectively). Since 80% of the SIR are based on research performance and innovation output, research-intensive organizations and regions in Europe and Asia emphasize research performance assessments regardless of whether or not organizations publicly publish a MS. Evidence consistent with this conclusion includes:

- Beijing and Shanghai are among the top five cities of the world's science hotspots (Nature Index, 2020).

- Europe and China have surpassed the US as the world leaders in science and engineering articles published (Tollefson, 2018).
- Over the past 40 years, Europe and Asia have been among the top five regions with the highest number of patents filed (WIPO, 2019).
- An elite group of public universities in China, known as the C9 League, and governmental entities, such as the Max Planck Gesellschaft, are global research sources.

With respect to the sub-sample of private organizations, only 2.3 % were in the MS non-reporting group. Ireland and Hitt (1992) identified several reasons (or excuses) companies put forth for not developing a MS, including *no one will read it, too much effort/work for an impractical outcome, is only in an academic exercise; some are successful without one, and too much confidential information revealed*, among others. Our findings are consistent with Bart and Baetz (1998), who found mixed and mostly negative support for the idea that organizations with a MS should be associated with higher performance compared to organizations without one.

4.3. To What Extent Does the Macroeconomic Environment Affect MS Content?

Our results show the macroeconomic environment has a small effect on MS construction. Previous transnational research exploring differences between MSS and between MS and performance is sparse; the evidence suggests no significant differences across MSS from organizations in different regions due to differences in macroeconomic environments. MS content analysis for universities worldwide found that MSS tend to be longer for universities from Asia and shorter for those in Europe (Cortés-Sánchez, 2018). A study of MSS and financial performance in Latin American firms found no discernible differences between MSS from Brazil, Chile, or Mexico and their most frequently used keywords, namely, clients, products, quality, and shareholders (Cortés-Sánchez & Rivera, 2019).

The idea of isomorphism, i. e., cross-national harmonization due to institutional influences/pressures (Powell & Dimaggio, 1991) in MSS from universities, has been outlined and discussed elsewhere (Cortés-Sánchez,

2018). National laws affecting institutes of higher education could reinforce a path toward MS sameness, e. g., “universities should publicly state their commitment to teaching and research” (Kosmützky & Krücken, 2015). In sum, our findings led to the conclusion that the macroeconomic environment does not significantly affect MS content, except the MS corpus of the top 5 % of organizations in the SIR, considering that it diverges considerably from the MS of the remaining organizations. An explanatory factor with respect to institutional isomorphism in our sample of MSS is the harmonization of higher education laws, given that the higher education sector comprises the largest sector of our sample. Among current developments in higher education, Europe is becoming more standardized due to modular and tiered programs prompted by the Bologna process as a mechanism to promote intergovernmental cooperation between 48 countries (European Commission, n. d.).

4.4. Is RandI Performance in Organizations Better Explained by MS Content or Macroeconomic Environment?

Results showed that MS content and factors related to the macroeconomic environment have a negligible effect on RandI performance in the short run. However, the practical and statistical significance of organizations’ 2014 SIR suggests a persistent effect that dampens or overwhelms the short-run impact of MS and contextual factors.

Over 2 120 organizations reported a MS and had complete information in the SIR for the 2014-2018 period. For Asia and Europe, most of these organizations were universities and government organizations, while for the US, they were universities, hospitals, and health-related institutions.

Which factors gave those organizations an advantage with respect to their position and persistence? For universities and hospitals / health institutes in the US, basic research productivity has been shifting from corporations to universities since the 1970s (Arora et al., 2019). The National Institutes of Health (NIH), the government’s medical research agency, plays a fundamental double-role as a national funding source and research powerhouse. The NIH is made up of 27 institutes and centers, and 156 Nobel Prize winners have received its support (NIH, n.d.). The literature on the State’s role in promoting radical innovation argues the NIH has been the nation’s and the world’s

most important investor in medical research since its foundation in 1938 (Mazzucato, 2015). In the private sector, corporations such as Amazon, Google/Alphabet, Apple, Tesla, and Netflix, which consistently appear in innovation meta-analyses, share a common interest in artificial intelligence and a digital platform business model (Lichtenthaler, 2018).

In the short run, the effect of ECI on RandI performance is almost negligible. However, comprehensive studies on the effect of the research output on economic growth (i. e., a variable that the ECI explains well) argue that the effect is significantly positive with a few caveats. Namely, the effect of the research output is exceptionally high in fields such as engineering and technology, social sciences, and physics, and such effects occur mainly through structural changes, i. e., by relocating resources toward productive sectors (Pinto & Teixeira, 2020).

Regarding the patenting component of the SIR, various findings have pointed out that half of product innovation is not associated with patenting. Market leaders use patents to deter competitors' innovation and protect their sales (Argente et al., 2020). Conversely, half of product growth and innovation come from firms that do not engage in patenting. From a historical perspective, attempts to disentangle the effect of innovation on economic growth have argued that growth accelerated after 1750 and reached a maximum in the middle of the twentieth century primarily due to the two industrial revolutions brought about by the invention of the steam engine, new manufacturing processes and railroads, as well as the use of electricity, the internal combustion engine, the development of communications technology, and chemicals (Gordon, 2012). A third industrial revolution (represented by computers, the Internet, and mobile phones) produced stunted growth between 1996-2004.

Conclusion

Strategic planning processes demand substantial human and financial resources. Among such processes is the formulation of an organization's MS that seeks to highlight the organization's purpose, values, standards, behaviors, and strategy that must also consider content characteristics such as readability and uniqueness. A fruitful stream of research has produced a considerable amount of evidence on the relationship between MSS and organizational performance from a financial perspective. However, the literature to date has left several questions unaddressed, such as whether organizations that publicly communicate their MS exhibit higher RandI performance than those who do not, whether the macroeconomic environment affects MS content, and whether RandI performance in organizations is better explained by content MS or by the macroeconomic environment. We shed light upon those questions in this study.

The most frequent term used in MS, "exploration," shows the need for private organizations' MS to express self-awareness. We also found extensive use of non-differentiated terms such as *research*, *health*, *university*, and *world*. Private sector MSS are inclined to emphasize *innovation*, social responsibility (*lives*), and products. *Research* is a priority in all but the private sector. Similarities between the health and higher education sectors were consistent with the themes of *education* and *learning* found in the MSS of both. Separately, we found that MSS do not contain negative, positive, or interesting tones.

The median RandI performance of organizations that do not report an MS is significantly higher than those that do report one. Since the MS is a strategic planning tool that originated in the United States, both researchers and practitioners in Asia, Europe, Latina America, and Oceania adopted the practice after its establishment. Most non-reporting organizations are in Asia and Europe, regions with large numbers of organizations that produce remarkable research and substantial patents regardless of the lack of a public MS. Reasons for not having an MS, such as the fact that its development demands too much effort/work for an impractical outcome, were stated in several cases in the private sector. The macroeconomic environment showed a small effect on MS due to isomorphism in universities across regions attempting

to harmonize and standardize higher education policies and mechanisms seeking to promote intergovernmental cooperation in regions such as Europe. Third, macroeconomic environment factors' effects on organizational performance are negligible due to the complex interactions between the RandI outputs assessed in the SIR and a country's productive output and its structures, created to build and act as repositories for knowledge, the shift in research activity from the private sector to universities, the decisive role of the government in supporting long-term, high-risk RandI-related activities, and the large size of universities. Among corporations, the persistence of organizations' appearing in innovation rankings is related to a business model that is oriented toward digital platforms and the intensive use of artificial intelligence.

Future studies could trace MS's adoption or modifications in the presence of significant organizational performance change, controlling for environmental and inter-industry factors. Combining various performance indicators, including financial, RandI, and sustainability, in an integrated framework could provide a holistic and integrated understanding of the MS-performance relationship.

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Table 3. Examples of MS by readability and tone characteristics

Characteristic	Index	Organization	MS
Readability	1.3	Amgen	To Serve Patients
	108.7	Rashtrasant Tukadoji Maharaj Nagpur University	To provide greater access for higher education to all and in particular to the socially and educationally unprivileged youth upholding the principle of social equity; to promote academic excellence and innovation through state-of-the-art Undergraduate, Postgraduate, Doctoral and Post-Doctoral programs; to make the education globally competitive and socioeconomically relevant through competent faculty, modern infrastructure and technology support; to enhance the status of Departments, Conducted and Affiliated Colleges in the fields of knowledge generation and dissemination by pro-actively supporting cutting edge research; to offer educational programs catering the current and future needs of society, region and industries; to provide inspiring conducive academic, social and cultural experience atmosphere to the students, teachers and staff facilitating realization of their full potential and all round development; to increase the efficiency, transparency and accountability in governance upholding the best interest of the students and the community; to reform examination system for improving standard of evaluation and weeding out systemic inefficiencies; to ensure continued adequate funding through knowledge enterprise and efficient resource management; to strive for community welfare through extension services involving youth in order to cultivate the spirit of integration and sense of ownership as well as social responsibility in them; to acquire and nurture creative human resources and upgrade excellence and skills of existing staff; extensive use of ICT for teaching, information dissemination, administrative, financial, examination processes and transactions between students, colleges and various departments of university; to encourage and facilitate inter-institutional and international exchange programs and collaborations in teaching and research.
Lexical diversity	1.414	Kuopio University Hospital	To promote health
	15.92	Colgate University	Colgate's mission is to provide a demanding, expansive, educational experience to a select group of diverse, talented, intellectually sophisticated students who are capable of challenging themselves, their peers, and their teachers in a setting that brings together living and learning. The purpose of the university is to develop wise, thoughtful, critical thinkers and perceptive leaders by challenging young men and women to fulfill their potential through residence in a community that values intellectual rigor and respects the complexity of human understanding

Characteristic	Index	Organization	MS
Polarity	-26	Institut de Diagnosi Ambiental i Estudis de l'Aigua	<p>It is difficult to overemphasize the potential value of high-quality, hard science based research disseminated on an international stage in the fight to help resolve, or at least ameliorate, twenty-first century environmental problems as extreme as hydrologic sustainability, megacity air quality, and the ongoing global extinction event affecting so many species in our ecosystems. Human society is expanding and globalizing at an unprecedented, accelerating rate, pushing the limits of what our ecosystems can sustain. Increased water use and severe scarcity, especially in arid and semiarid regions, have been highlighted by the World Economic Forum as a global risk. Water shortages result not from the global lack of water, but from the spatial and temporal mismatch between demand and supply, and things are going to worsen as our collective demand increases. Water engineers have traditionally overcome the problem using reservoirs, water transfers, desalination and groundwater, but all these sources and solutions are by now severely stressed, and the water is increasingly polluted with a wide range of emerging contaminants. Of particular global concern are emerging micropollutants (EMPs) and persistent organic pollutants (POPs) which can biomagnify and bioaccumulate in ecosystems, inducing toxic effects that can be as poorly understood as they are potentially pernicious. In the field of air quality, we are similarly facing an environmental problem of unprecedented scale. Realistic calculations by the UN predict 5 billion people being added to current urban populations by 2050, with nearly 90 % of the increase concentrated in Asia and in Africa. Megacities reaching populations of 100 million people are envisaged, creating environmental challenges that are hard to imagine. New approaches are required. In the case of water supplies, Integrated Water Resources Management Groundwater is emerging as the way to address water scarcity, combining surface and ground water and pristine and wastewater to reconcile the demands of people, agriculture, industry and the environment. Society is recognizing that it no longer has the luxury of using water only once. With regard to water cleanliness, the current trend is to reduce the production of residues and the use of chemical products during depuration processes, leaning more toward the natural treatment for supply water production. Finally, all of us living in cities are increasingly aware of the fact that we breathe air contaminated with toxic particles and gases. In Europe, the main problem is road traffic, but in the developing world these combine with industrial and domestic emissions and poor infrastructure to create what is a global insult to human health and results in millions of premature deaths. We need to develop more efficient and accurate methods of measuring our daily dosage of these pollutants, draw up legislative controls that really make a difference, tell people exactly what they are breathing and why, and find new solutions such as hightech purifiers and low-emission transport in greener cities where clean air is a priority demanded by its citizens.</p>
	68	Colgate University	[Shown above.]

Source: Based on organizations' websites.

Table 4. Descriptive statistics of the SRI, ECI, polarity, and diversity by region

		SRI	ECI	FKRI	Polarity*	Lexical Diversity*
Region	Obs.	Median (IQR)	Mean (s.d)	Mean (s.d)	Mean (s.d)	Mean (s.d)
Africa	425	649 (59.0)	-0.50 (0.70)	22.1 (6.2)	7.0 (6.3)	5.3 (1.6)
Asia	3745	603 (112.0)	1.01 (0.90)	20.4 (8.3)	6.7 (6.3)	5.4 (1.5)
Europe	3715	557 (178.0)	1.32 (0.54)	20.0 (9.2)	6.0 (6.4)	5.5 (2.0)
LATAM-CAR	85	629 (119.2)	0.21 (0.13)	23.0 (8.4)	2.3 (2.2)	5.0 (1.7)
MUL (Multinational institutions)	155	378 (247.0)		13.8 (4.6)		
North America	3505	531 (247.0)	1.48 (0.28)	18.9 (6.9)	8.0 (7.6)	5.2 (1.9)
Oceania	415	538 (129.0)	-0.27 (0.23)	16.6 (6.8)	4.8 (4.5)	4.3 (1.3)
All	12045	568 (169.0)	1.15 (0.77)	19.7 (8.2)	6.9 (6.8)	5.3 (1.8)

Note: * statistics computed after removing missing values and outliers.

Source: Based on SCImago (2019); Economic Complexity Observatory (2017), and organizations' websites.

Table 5. Descriptive statistics of the SRI and ECI by quintiles

Quintile	Obs.	SRI Median (IQR)	ECI Mean (s.d)	FKRI Mean (s.d)	Polarity* Mean (s.d)	Lexical Diversity* Mean (s.d)
1	2680	299 (218)	1.5 (0.5)	18.5 (6.9)	5.5 (6.77)	5.2 (1.7)
2	2345	512 (59)	1.3 (0.7)	18.5 (7.0)	6.3 (5.6)	4.9 (1.6)
3	2330	573 (40)	1.2 (0.7)	18.7 (7.5)	6.5 (5.6)	5.1 (1.7)
4	2510	624 (35)	1.0 (0.8)	21.1 (9.0)	7.2 (6.8)	5.5 (1.7)
5	2180	661 (34)	0.6 (0.9)	22.2 (9.6)	8.8 (9.0)	5.9 (2.0)
All	12045	568 (169)	1.2 (0.8)	19.7 (8.2)	6.9 (6.8)	5.3 (1.8)

Note: *statistics computed after removing missing values and outliers.

Source: Based on SCImago (2019), Economic Complexity Observatory (2017), and organizations' websites.

Table 6. MLE Estimates of the Structural Equation Modeling

<i>Variables (Explanatory ---> Explained)</i>			Estimate	Std. error.	C.R.	P values	Standardized estimates
Measurement model							
Mission	--->	Readability	1.000			0.938	
Mission	--->	Polarity	13.066	1.211	10.789	***	0.610
Mission	--->	Lexical Diversity	5.523	.430	12.839	***	0.984
Mission	--->	Innovativeness	-.096	.012	-7.920	***	-0.294
Innovation Performance	--->	Ranking (2017)	.924	.009	104.494	***	0.972
Innovation Performance	--->	Ranking (2018)	1.000				0.938
Innovation Performance	--->	Ranking (2016)	.945	.012	77.118	***	0.979
Structural model							
Mission	--->	Innovation Performance	-4.168	3.011	-1.384	.166	-0.10
Regressions							
Complexity	--->	Mission	.015	.006	2.666	.008	0.037
Ranking (2014)	--->	Mission	.000	.000	4.565	***	0.148
Complexity	--->	Innovation Performance	4.674	1.250	3.740	***	0.027
Ranking (2014)	--->	Innovation Performance	1.036	.013	80.594	***	0.999
Variances							
Complexity			.620	.026	23.467	***	
Ranking (2014)			17379.600	740.589	23.467	***	
e_Mission			.099	.016	6.206	***	
e_Innovation Performance			415.920	59.417	7.000	***	
e_Lexical diversity			.100				
e_Readability			.657	.028	23.351	***	
e_Polarity			29.162	1.266	23.027	***	
e_Ranking 2017			922.835	58.932	15.659	***	
e_Ranking 2018			2571.100	123.369	20.841	***	
e_Ranking 2016			729.092	59.378	12.279	***	
e_Innovativeness			.010	.000	23.398	***	

Notes: e_variable refers to the unexplained variance of variable.

*** refers to coefficients with p-value below 0.001. The fit statistics are Chi-sq = 1062.52 (285 df), p-value = 0.000, GFI = 0.961, AGFI = 0.919, CFI = 0.984, TLI = 0.974, NFI = 0.979, RMSEA = 0.022.