Applied Quantitative Analysis
Available online at: www.researchsynergy.org/quant
Volume **1** Number **1** (2021) Article **656**

Editorial

Applied Quantitative Analysis: An inaugural statement

Corinthias P. M. Sianipar [1,*]

[1] Kyoto University, Kyoto 606-8502, Japan

Abstract

This article marks the inaugural of Applied Quantitative Analysis journal. It is founded on the idea of numbers as the first and foremost mathematical object that act as the harbinger of all meaning. The journal aims to provide a medium for researchers and practitioners to exchange and disseminate theoretical and practical works that employ quantitative analysis methods to their furthest extent. This journal covers research topics and themes in the three branches of sciences (*i.e.*, formal science, natural science, and social science). In addition to discipline-specific studies, the journal encourages multidisciplinary and interdisciplinary works. Basically, this journal accepts manuscript submissions as Research, Review, Method, Commentary, or Book Review articles. For the submission, each article type has its own general structure and particular requirements. On the other hand, this journal continuously establishes its diverse Editorial Board by inviting experienced scholars in the applied quantitative analysis area from different disciplines and geographical locations. As a focal point of publications among quantitative scholars, the journal invites quantitative scholars to join as reviewers to ensure the solid quality of published papers.

Keywords: *wheel of science; formal science; natural science; social science; quantitative research*

BACKGROUND

We are living in the Age of Humans. It was initially dubbed as the Anthropocene by prominent scholars in geological sciences [1]. Basically, discussions on the Anthropocene are the result of scientists arguing to recognize the scientific thoughts of humans as a distinctive force that has been shaping the Earth. In this human-dominated epoch, scientific discourses have long been expanding to examine the simultaneous impact of human activities on various ecological systems [2], socioeconomic structures [3], and psychocultural constructs [4]. Our enormous influences on different natural and social facets of our home planet are thus raising concerns on how to manage them for the sake of our livable future [5]. In that sense, our attempts to learn every detail of various natural and social phenomena require endless research works focusing on measurable facts. However, our understanding of a phenomenon depends on the perspective of our interpretation. Roughly speaking, different perspectives portray intellectual traditions in various scientific disciplines [6]. Thus, we need a plausible language to talking about and measure facts between schools of thought. While linguistically there are different technical and/or cultural languages as well as various state-of-the-art translation techniques, we, at this point, realize an undeniable value of talking in a long-known universal language in the history of humankind: numbers [7][8].

Numbers, with their underlying mathematical philosophy [9], are fundamental for the process of counting, measuring, or labelling [10]. They have been recognized by both believers and non-believers of science since numbers exist in the realm of the philosophy of meaning, outside the reality of belief systems. In Frege's reflection [11], the definition of a number must be purely logical,

* Corresponding author(s)
assist@cpmsianipar.com (C.P.M.S.)

DOI: 10.31098/quant.656

making it able to state the same cardinality of equinumerous sets of classes. Technically, the understanding is parallel to Plato's way of stating the meaning of color [12], with which he suggested us to focus on what attributes that objects with the "same" color have in common. Numbers, according to Frege [11] and would later be endorsed by Russell [13], carry the same critical awareness to distinguish what is the "same" or "different". In practice, it makes everyone able to approach a meaning with the clearest sight. Essentially, numbers become the harbinger of all meaning, by which, in Pythagoras' thought [14], they act as the foundation of more applied concepts (*e.g.*, arithmetic to geometry). In establishing our interpretation and understanding of a phenomenon, therefore, it is imperative that we include numbers as the first and foremost objects to constitute our intended meaning of every research focus in its simplest delivery.

In "*The Nature of Mathematics*", Max Black [15] neatly put a question mark ("?") to conclude his critical thinking on the philosophy of mathematics, including numbers as mathematical objects for counting, measuring, and labelling. In any quantitative observation on ecological systems, socioeconomic structures, or psychocultural constructs, it hence takes a thorough process to first ask the right research questions and eventually end the research process with valid, reliable, and repeatable answers for the questions [16]. Through continuous cycles, the quantitative answers of prior works would later be the source of right questions for further research works. In that sense, employing a proper applied quantitative analysis ensures the wheel of science [17] in a much objective way possible. In each of the three branches of science (*i.e.*, formal, natural, and social sciences), the logical definition of numbers and their specific-purposed meaning produce a vast spectrum of possibilities to apply different methods of quantitative analysis for various research topics. Technically, each method offers specific logic and approach to treat numbers yet flexible prospects of applications. As the result, techniques for applied quantitative analyses can go beyond the boundary of scientific disciplines. The apparently infinite possibility of their applications, therefore, would center on the creativity of scientists as the conductor of research works [18].

AIM AND SCOPE

Consequently, research works employing applied quantitative analyses find their ways to interested audiences in scholarly communities through publishing channels available in their respective "applied" scientific disciplines. On the one hand, it makes the works able to contribute to the body of knowledge and push the boundary of the disciplines. On the other hand, the siloed publishing means discourage a stronger emphasis over the quantitative analyses those works are founded on. For discipline-bounded publishing channels, headlines might be the first and most attractive point to follow from a scientific progress. We, however, would like to see how rigorous a research work applies quantitative method(s), and how it produces robust numerical results. The particular focus on the quantitative methods and numbers they gather, process, and produce allow us to come up with the idea of establishing this journal: *Applied Quantitative Analysis* (hereinafter "the/this journal"). It is therefore the sole **aim** of the journal to present papers that cover the robust application of singular or multiple quantitative method(s) for analyzing diverse themes and topics in various disciplines. We hence attempt to provide a medium for researchers, practitioners, and other relevant professionals throughout the world to exchange and disseminate their practice-oriented or theoretical works that employ quantitative analysis method(s) to its furthest extent. To explain our intended ranges, we thus derive the sole aim into prospective scope of work in the three branches of science, which act as the foundation of applied sciences.

Social Sciences

The journal defines social science as the group of academic disciplines devoted to portraying the society and how individuals construct their behavior within the society according to various aspects. Social science studies produce interesting takes on the inclusion of applied quantitative analyses to count, measure, and label socioeconomic/psychocultural phenomena. As the baseline, the journal intends to cover quantitative social sciences. Prospective authors may consider the application of quantitative analyses in the social science branch to include those in Sustainability Science, Management [19], Economics and Finance [20], Accounting [21], Business, Development, Planning, Area Studies, Organization, Human Resources, Operations, Entrepreneurship, Education [22], Tourism [23], Hospitality, Industrial Relations, Marketing [24], Innovation Studies, Geography [25], Spatial Sciences, Demography, Population, Ecosystem Services, Gerontology [26], Library Sciences, Applied Linguistics [27], Language and Literature, Media, Political Sciences [28], Legal and Law [29], Military Sciences, Governance and Public Administration, Social Works, Psychology [30], Sociology [31], History [32], Anthropology [33], Archeology, Religious Studies, *etc*.

Natural Sciences

The journal refers to the natural science as the group of academic disciplines concerned to understand, predict, and describe rules that govern natural phenomena through quantitative methods from empirical observations to experimentations. Since natural science is basically the quantification of natural phenomena, the journal covers the whole outline of natural sciences. The baseline includes Astronomy, Life Sciences, Chemistry, Earth Sciences, and Physics [34][35]. Prospective authors may consider the application of quantitative analysis methods in Engineering, Technology, Civil & Architecture, Computers, Mechanics, Electronics, Magnetism, Optics, Acoustics, Atomic & Molecular Physics, Cryogenics, Energy Sciences, Materials Science & Polymers, Geology, Oceanography, Glaciology, Hydrology, Limnology, Soil Sciences, Seismology, Environmental & Ecological Sciences, Nuclear, Agriculture, Veterinary & Animal Sciences, Virology & Toxicology, Epidemiology, Histology, Morphology, Mycology, Physiology, Oncology, Zoology, Forestry & Botany, Conservation, Chronobiology, Forensic Sciences, Paleontology, Petrology, Atmospheric Sciences, Climatology, Meteorology, Space Sciences, Planetary Sciences, Astrometry, Cosmology, *etc*.

Formal Sciences

The journal defines the formal science as a branch of science dedicated to seeking knowledge generation through the study of formal language disciplines. Formal science uses symbolic systems to portray abstract structures free from constrained conceptions applicable in the other two branches of science. In that sense, formal science holds its logics in all conceivable worlds possible, making them useful and applicable in all empirical domains. Since it is methodologically and logically *a priori*, formal science acts as the precursor of scientific methods in other science branches. Thus, the journal intends to cover formal science for encouraging further developments of existing quantitative analysis methods by rigorously involving thorough and robust analytical thoughts. The baseline of coverage includes Mathematics, Computer Science, Statistics, Information Science, and Systems Science. Prospective authors may consider submitting their works on Logics, Statistical Science, Theoretical Mathematics, Information Theory, Theoretical Computer Science, Systems Theory, Decision Theory, Game Theory, Artificial Intelligence, Control & Systems, Linear Optimization, Probability & Uncertainty, Theoretical Linguistics, *etc*.

ARTICLE TYPES

Research

If a manuscript being submitted contains the full report of data, rigorous method(s) being used, and comprehensive reading as well as discussion on the results, it is considered as a Research article. The general structure for a Research manuscript includes full *Introduction*, *Literature Review* (if required), *Methodology*, *Results*, *Discussion*, and *Conclusion*. The *Introduction* section must mention the necessity of the research by considering emerging research gap(s), research aim(s), and research question(s). The *Literature Review* section includes the search for observed variables, research framework, and positioning of the research among existing literature. The *Methodology* section must contain singular or multiple quantitative analysis methods, including detailed reasoning for and explanation of the intended use(s). Mixed-method studies are allowed as long as the main method being employed is quantitative. The *Result*s section must also show a solid execution of the method(s). The *Discussion* section must deliver a thorough reading of the results and direct comparisons to existing literature that have dealt with similar topics. One Research manuscript should contain 6,000-8,000 words. The counting includes manuscript text, tables, figures, and equations in all sections except Title, Abstract, Keywords, and References. A longer word count is allowed if one or more reviewer(s) requires author(s) to add a considerable amount of text, table, equation, and/or figure to the first submitted version.

Review

The primary requirement for a Review article in this journal is the inclusion of multiple literature databases and quantitative methods for the review. Literature databases may include Scopus®, Web of Science™, Google Scholar, ProQuest®, *etc*. As the baseline, prospective authors should consider employing Systematic Literature Review in conjunction with a rigorous application of multiple statistical methods to produce quantitative results. Systematic Literature Review protocols may include PRISMA [36], meta-analysis [37], *etc*. The quantitative processing of reviewed literature should employ multiple methods, which may include Meyer's Index [38], Correspondence Analysis [39], Cluster Analysis [40], *etc*. The general structure for this manuscript type includes *Introduction*, *Methodology*, *Results*, *Discussion*, and *Conclusion*. The *Methodology* section must include a detailed explanation of research design for the quantitative-minded Systematic Literature Review, including reasons to use each quantitative method being applied. The *Results* section must provide the step-by-step results according to the stages provided in the research design. The *Discussion* section must show the synthesis and mapping of critical issues emerging from the reviewed literature, by which future directions for the topic/field can be suggested. One Review manuscript should contain 8,000-10,000 words. The counting shall cover text, tables, figures, and equations in all sections except Title, Abstract, Keywords, and References.

Method

For manuscripts containing the proposal of novel and tested theoretical advances, author(s) should consider submitting their works as Method articles. Each Method manuscript contains the development of a new quantitative method, the extension of an existing quantitative tool/protocol, or the integration of different quantitative techniques. This type is preferrable for author(s) who intends to publish his/her/their quantitative methodological work without applying the proposed method into a real case study. However, a submitted Method manuscript requires author(s) to test

the proposed method with one or more hypothetical dataset(s). The hypothetical model testing acts as a proof-of-work of the proposed method. The general structure of a Method article includes *Introduction*, *Development*, *Testing*, *Discussion*, and *Conclusion*. The *Development* section must explain the development process of the proposed quantitative method in detail. Besides, the section must include a detailed protocol for applying the proposed method. The *Testing* section must include a hypothetical testing of the proposed method, including the results of the testing. The *Discussion* section should explain the results of the testing in comparison to similar methods that have existed in the literature. The comparison is important to show both promising advantages and expected limitations of the proposed method. Any submission under Method type does not have any word count requirement.

Commentary

This article type covers letters to editor on topical issues, comments on a published article in the journal, replies to the comments, or commentaries to an ongoing scientific discourse on quantitative analysis. This journal encourages Commentary articles to generate active scholarly discourses on various issues in quantitative analysis domain. Thus, any Commentary manuscript should use constructive language style and focus on solution(s) to the arising issue(s). Author(s) should prepare their Commentary independently, and is not required to contact the Editor-in-Chief of the Applied Quantitative Analysis journal to submit a Commentary manuscript. The general structure of a Commentary article in this journal simply includes *Summary* and *Comments*. The *Summary* section sums up the object being commented (topical issue, published article, reply, or ongoing scientific discourse). The *Comments* section includes detailed comments on the commented object, which should include citations to other publications to support the comments. One Commentary manuscript should contain 1,000-2,000 words, excluding Title, Abstract, Keywords, and References. The Applied Quantitative Analysis journal does not accept comments on articles not published in the journal. Comments on articles published elsewhere should be submitted to their respective journals given that they allow the submission of comments as such.

Book Review

This article type is similar to Commentary but differs in the object and delivery of discussion. The focus of a Book Review is to provide a summary of, give opinions on, and present implications from a recently published book(s) in applied quantitative analysis area. Author(s) is required to contact the Editor-in-Chief of Applied Quantitative Analysis journal to communicate one's intention to write a Book Review manuscript on a specific book. If the Editor-in-Chief decides to allow the submission of the proposed Book Review, the author(s) prepares the Book Review manuscript independently. The general structure of a Book Review article includes *Summary*, *Review*, and *Implications*. The *Summary* section includes the summary of the book being reviewed. The *Review* section contains opinions from the book reviewers (*i.e.*, the authors of the book review) on the contents of the book being reviewed. The *Implications* section takes insights from the book being reviewed and suggests prospective academic, managerial, and/or policy implications for the scholarly communities, common public, and/or other relevant stakeholders of any issues carried by the book. Any argument in *Review* and *Implications* sections should be directly compared or contrasted to existing literature by properly citing them. One Book Review manuscript should contain 1,000-2,000 words, excluding Title, Abstract, Keywords, and References.

CONCLUDING REMARKS

This inaugural statement marks the beginning of Applied Quantitative Analysis journal as a collective effort to provide a medium for researchers and practitioners for communicating their scientific advances on the application of quantitative analysis methods in different disciplines. Since applied quantitative analysis is an ever-expanding area, we plan to maintain a continuous growth of our scope in numbers, making above explanations on the scope of work for this journal as neither a fixed boundary nor an exhaustive list of potential opportunities. To promote the value of applied quantitative analyses as a focal point between scientific disciplines, we encourage the submission of applied quantitative analysis in a singular work involving multiple disciplines/perspectives, whether it is interdisciplinary (*e.g.*, Bioinformatics, Thermoeconomics, *etc*.) or multidisciplinary (*e.g.*, Nexus Approaches, Econometrics, *etc*.). Articles containing single or multiple disciplines will receive equal treatments throughout review processes.

On the other hand, we also invite experienced scholars in applied quantitative analysis from different disciplines to join our Editorial Board. The involvement of members of the journal's Editorial Board from multidisciplinary areas would ensure the fundamental idea of Applied Quantitative Analysis journal as a collective effort from, by, and for the scholars and practitioners of applied quantitative analyses. Also, we continuously monitor our past and ongoing peer-review processes to consider inviting experienced scholars to join the journal as new Editorial Board members. The invitation will be considered for experienced reviewers who have actively been involved to review papers submitted to the journal. Then, we also invite other experienced and early-career scholars to join us as reviewers to ensure the solid quality of published papers in the journal. The request to join as reviewers for this journal can be directed through the editorial office (Managing Editor) of the Applied Quantitative Analysis journal.

ACKNOWLEDGMENT

All company, product, and service names in this article are the property of their respective owners. Any mention is for identification purposes only and does not imply an endorsement.

REFERENCES

[1] Lewis, S. L., & Maslin, M. A. (2015). Defining the Anthropocene. *Nature*, *519*, 171–180. https://doi.org/10.1038/nature14258
[2] Wackernagel, M., & Rees, W. (1996). *Our Ecological Footprint: Reducing Human Impact on the Earth*. New Society Publishers.
[3] van Vuuren, D. P., Riahi, K., Calvin, K., Dellink, R., Emmerling, J., Fujimori, S., KC, S., Kriegler, E., & O'Neill, B. (2017). The Shared Socio-economic Pathways: Trajectories for human development and global environmental change. *Global Environmental Change*, *42*, 148–152. https://doi.org/10.1016/j.gloenvcha.2016.10.009
[4] Münster, R. (2020). The Anthropocene, Technology and Fictional Literature. *Humanities*, *9*(3), 56. https://doi.org/10.3390/h9030056
[5] Wamsler, C. (2013). Managing risk: From the United Nations to local-level realities - or vice versa. *Climate and Development*, *5*(3), 253–255. https://doi.org/10.1080/17565529.2013.825203
[6] Foucault, M. (1978). *Discipline and Punish: The Birth of the Prison*. Vintage Books.
[7] Guedj, D. (1996). *Numbers: The Universal Language*. Éditions Gallimard.
[8] Wittgenstein, L. (1922). *Tractatus Logico-Philosophicus*. Kegan Paul, Trench, Trubner & Co.
[9] Whitehead, A. N., & Russell, B. (1910). *Principia Mathematica (vol. 1)*. Cambridge University Press.
[10] Bridgman, P. W. (1927). *The Logic of Modern Physics*. Macmillan.
[11] Frege, G. (1884). *Die Grundlagen der Arithmetik*. Koebner.

[12] Taylor, A. E. (1928). *A Commentary of Plato's Timaeus*. Clarendon Press.
[13] Russell, B. (1920). *Introduction to Mathematical Philosophy* (2nd ed.). George Allen & Unwin.
[14] Ridgeway, W. (1896). What led Pythagoras to the doctrine that the world was built of numbers? *The Classical Review*, *10*(2), 92–95. https://doi.org/10.1017/S0009840X00203296
[15] Black, M. (1933). *The Nature of Mathematics: A Critical Survey*. Kegan Paul, Trench, Trubner & Co Ltd.
[16] Thanasegaran, G. (2009). Reliability and validity issues in research. *Integration & Dissemination*, *4*, 35–40.
[17] Wallace, W. L. (1971). *The Logic of Science in Sociology*. Aldine.
[18] Holton, G. (1960). Modern science and the intellectual tradition. *Science*, *131*(3408), 1187–1193.
[19] Render, B., Stair Jr., R. M., & Hanna, M. E. (2012). *Quantitative Analysis for Management* (11th ed.). Pearson Education India.
[20] Härdle, W. K., Chen, C. Y.-H., & Overbeck, L. (2017). *Applied Quantitative Finance* (3rd ed.). Springer. https://doi.org/10.1007/978-3-662-54486-0
[21] Anderson, S. W., & Widener, S. K. (2006). Doing Quantitative Field Research in Management Accounting. In C. S. Chapman, A. G. Hopwood, & M. D. Shields (Eds.), *Handbook of Management Accounting Research* (Vol. 1, pp. 319–341). Elsevier. https://doi.org/10.1016/S1751-3243(06)01012-1
[22] Petscher, Y. M., Schatschneider, C., & Compton, D. L. (2013). *Applied Quantitative Analysis in Education and the Social Sciences*. Routledge.
[23] Baggio, R., & Klobas, J. (2017). *Quantitative Methods in Tourism* (2nd ed.). Channel View Publications. https://doi.org/10.21832/9781845416201
[24] Franses, P. H., & Paap, R. (2004). *Quantitative Models in Marketing Research* (2nd ed.). Cambridge University Press.
[25] Murray, A. T. (2010). Quantitative geography. *Journal of Regional Science*, *50*(1), 143–163. https://doi.org/10.1111/j.1467-9787.2009.00642.x
[26] Weil, J. (2017). *Research Design in Aging and Social Gerontology*. Routledge. https://doi.org/10.4324/9781315450162
[27] Purpura, J. E., Brown, J. D., & Schoonen, R. (2015). Improving the validity of quantitative measures in applied linguistics research. *Language Learning*, *65*(S1), 37–75. https://doi.org/10.1111/lang.12112
[28] Rice, S. A. (1928). *Quantitative Methods in Politics*. Knopf.
[29] Finkelstein, M. O. (1978). *Quantitative Methods in Law: Studies in the Application of Mathematical Probability and Statistics to Legal Problems*. Free Press.
[30] Lewis, D. (1960). *Quantitative Methods in Psychology*. McGraw-Hill. https://doi.org/10.1037/11626-000
[31] Blalock, H. M. (1989). The real and unrealized contributions of quantitative sociology. *American Sociological Review*, *54*(3), 447. https://doi.org/10.2307/2095616
[32] Furet, F. (1971). Quantitative history. *Daedalus*, *100*(1), 151–167.
[33] Mulder, M. B., Caro, T. M., Chrisholm, J. S., Dumont, J.-P., Hall, R. L., Hinde, R. A., & Ohtsuka, R. (1985). The use of quantitative observational techniques in anthropology [and comments and replies]. *Current Anthropology*, *26*(3), 323–335. https://doi.org/10.1086/203277
[34] Barr, S. M. (2006). *A Students Guide to Natural Science*. Intercollegiate Studies Institute.
[35] Simhony, M. (1994). *Invitation to the Natural Physics of Matter, Space, and Radiation*. World Scientific. https://doi.org/10.1142/2254
[36] Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Systematic Reviews*, *10*, 89. https://doi.org/10.1016/j.ijsu.2021.105906
[37] Gates, S. (2002). Review of methodology of quantitative reviews using meta-analysis in ecology. *Journal of Animal Ecology*, *71*(4), 547–557. https://doi.org/10.1046/j.1365-2656.2002.00634.x
[38] Meyer, D. E., Mehlman, D. W., Reeves, E. S., Origoni, R. B., Evans, D., & Sellers, D. W. (1983). Comparison study of overlap among 21 scientific databases in searching pesticide information. *Online Review*, *7*(1), 33–43. https://doi.org/10.1108/eb024120

[39] Salamin, X., & Hanappi, D. (2014). Women and international assignments: a systematic literature review exploring textual data by Correspondence Analysis. *Journal of Global Mobility*, *2*(3), 343–374. https://doi.org/10.1108/JGM-09-2013-0058

[40] Cipresso, P., Giglioli, I. A. C., Raya, M. A., & Riva, G. (2018). The past, present, and future of virtual and augmented reality research: A network and cluster analysis of the literature. *Frontiers in Psychology*, *9*, 2086. https://doi.org/10.3389/fpsyg.2018.02086