R E V I S T A | J O U R N A L | R E V I S T A
Globalización, Competitividad y Gobernabilidad | Globalization, Competitiveness & Governability | Globalização, Competitividade e Governabilidade

GCG

The Journal *of* Globalization, Competitiveness, and Governability

Revista cuatrimestral | Four-monthly Journal | Revista Cuatrimestral

Vol. 18 Num. 1
JANUARY-APRIL 2024
ISSN: 1988-7116

https://gcgjournal.georgetown.edu

Effects of Environmental Discontinuity on the Performance of Teaching Hospitals in Brazil
Victor Godeiro de Medeiros Lima & Andrea de Oliveira Gonçalves

El Crecimiento Económico en México Después del SARS Cov-2
Eugenio Guzmán-Soria, Samuel Rebollar-Rebollar, Juvencio Hernández-Martínez, Aníbal Terrones-Cordero y Nicolás Callejas-Juárez

Influência do Desvio e da Turbulência Orçamentária no Resultado Primário de Governos Locais
Cleonice Witt, Ilse Maria Beuren e Nelson Hein

Connectedness Between Regional Financial Markets: Evidence from Covid-19 and Russia-Ukraine Conflict
Erik Muñoz H., Francisco Gálvez-Gamboa & Elmer Sánchez Dávila

Cryptocurrencies Accounting Treatment
Matheus de Lima Marques & Odilanei Morais dos Santos

Board Diversity and Compliance Practices
Felipe Arenas-Torres, Paz Cabrera-Vargas & Michel Zamorano-Labra

GCG
The Journal *of* Globalization, Competitiveness, and Governability

LETTER FROM THE EDITOR IN CHIEF

Editor in Chief

This issue of the Journal of Globalization, Competitiveness, and Governability continues with its commitment to our readers, in terms of frequency and quality criteria that are internationally accepted and audited by a number of institutions. GCG is currently indexed in: SCOPUS (***Elsevier Bibliographic Databases.*** Scimago Journal Rank), Categories: Business, Management and Accounting, Economics, Econometrics and Finance; ***EconLit*** (American Economic Association's electronic bibliography); ***EBSCO Publishing databases (Business Source Complete; Business Source Premier; Business Source Elite; Fuente Académica Premier; Fuente Académica Plus); and ABI/INFORM (ProQuest; LATINDEX; REDALYC; Google Scholar Metrics.*** This drive for quality has seen GCG categorised as an A-level Journal (top category) of all the Spanish Journals dealing with the human and social sciences by ***Web of Science*** and/or SCOPUS (ISOC-CSIC).

In the first paper, Victor Godeiro de Medeiros Lima and Andrea de Oliveira Gonçalves (Universidade de Brasília, Brazil) investigate the possibility of the existence of an environmental discontinuity in federal public teaching hospitals due to the incorporation of Empresa Brasileira de Serviços Hospitalários (EBSERH). The research methodology was the difference method with a quantitative approach, analyzing 51 hospitals, with 9 being excluded. For the authors, the results show that there were signs of discontinuity in two of the three dependent variables, the average admission per patient (at 1%) and the mortality rate (at 10%).

Cleonice Witt (Universidade do Contestado, Brazil), Ilse Maria Beuren (Universidade Federal de Santa Catarina, Brazil) and Nelson Hein (Universidade Regional de Blumenau, Brazil) analyze the influence of budgetary deviation and turbulence on the primary outcome of local governments with data from 230 Brazilian municipalities using hierarchical linear models. For the authors, budgetary turbulence seems to have a negative influence on the primary outcome of small municipalities and a positive influence on medium and large ones. Moreover, budget drift seems to negatively influence medium-sized municipalities and positively influence small and large municipalities. They conclude that when budgetary turbulences and deviations occur, the primary result of small and medium-sized municipalities is influenced negatively and that of large municipalities positively.

Matheus de Lima Marques and Odilanei Morais dos Santos (Universidade Federal do Rio de Janeiro, Brazil) investigate the perspectives of Brazilian accounting professors on the accounting treatment of cryptocurrencies. According to the authors, the experts established a moderate consensus between the situations examined for circumstances in which an entity purchases cryptocurrencies for itself and in cases where an entity produces cryptocurrencies (mining). In such circumstances, the initial recognition should be a financial instrument and the initial and subsequent measurement at fair value. This understanding differs from the prevailing literature, which states that cryptocurrencies cannot be recognized as a financial instrument. There are also disagreements about initial and subsequent valuations. As a result, the regulatory accounting framework needs to be updated so that cryptocurrencies can be more reliably recognized, valued and disclosed.

In the following article, the authors project Mexican economic growth in the face of SARS COV-2, using a Cobb-Douglas production function and annual

data from 1980 to 2022. For Eugenio Guzmán-Soria (Tecnológico Nacional de México); Samuel Rebollar-Rebollar (Universidad Autónoma del Estado de México); Juvencio Hernández-Martínez (Universidad Autónoma del Estado de México); Aníbal Terrones-Cordero (Universidad Autónoma del Estado de Hidalgo, Mexico) and Nicolás Callejas-Juárez (Universidad Autónoma de Chihuahua. Mexico), the results of the labor (0.60) and capital (0.37) elasticities indicate that the Mexican economy has a very close relationship with its labor force. The Solow residual (-10.26), which explains the factors that favor the economic development of a region, derived from technical progress, being negative indicates in part the lack of constancy in the gross formation of capital in Mexico, which has affected the growth rate, even when the labor factor has remained on the rise.

Researchers Erik Muñoz H. (Universidad de Talca, Chile), Francisco Gálvez-Gamboa (Universidad Católica del Maule, Chile) and Elmer Sánchez Dávila (Universidad Peruana de Ciencias Aplicadas, Lima, Peru) study the connectivity of seven regional financial markets from 2018 to 2023 through a TVP-VAR model. The selected time period allows us to study the effects of connectivity before and after international shocks such as COVID-19 and the Russian-Ukrainian war. The results show that these markets are highly connected, but the results are heterogeneous depending on the international shock. During the COVID-19 pandemic, global uncertainty led to greater interconnectedness; while the war conflict has no significant implications, but it did increase the sensitivity of regional markets close to the armed conflict.

Felipe Arenas-Torres, Paz Cabrera-Vargas and Michel Zamorano-Labra (Universidad de Talca, Chile) seek to determine the impact of board diversity on the implementation of compliance practices in Chilean companies. The research considered 1,322 reports on Social Responsibility and Corporate Governance. The results indicate that the degree of adoption of compliance practices is partially explained by the diversity in the composition of the boards of directors of Chilean companies. Likewise, the authors conclude that in Chile, there is a need for greater concern on the part of the authorities in the implementation of practices for the composition of boards of directors, and that compliance is a mechanism that is increasingly present in corporate governance.

I would once again like to thank all those who have made this journal possible: members of the Advisory Board, the Editorial Board, Editors and Associate Editors, assessors, authors and, last but not least, the readers.

Editor in Chief

GCG
The Journal *of* Globalization, Competitiveness, and Governability

CARTA DEL EDITOR IN CHIEF

Editor in Chief

Con este número la Revista de Globalización, Competitividad y Gobernabilidad continúa su andadura cumpliendo fielmente la periodicidad para con nuestros lectores y con los criterios de calidad, internacionalmente aceptados auditados por diversas instituciones. GCG actualmente se encuentra indexada en: SCOPUS (***Elsevier Bibliogrphic Databases***. Scimago Journal Rank), en las Category: Business, Management and Accountingy Economics, Econometrics and Finance; ***EconLit*** (American Economic Association's electronic bibliography); ***EBSCO Publishing´s databases (Business Source Complete; Business Source Premier; Business Source Elite; Fuente Académica Premier; Fuente Académica Plus); ABI/ INFORM (ProQuest; LATINDEX; REDALYC; Google Scholar Metrics.*** Esta apuesta por la calidad ha permitido que GCG esté categorizada como revista A (máxima categoría) de todas las revistas españolas de ciencias humanas y sociales en ***Web of Science*** y/o SCOPUS (ISOC-CSIC).

En el primer artículo, Victor Godeiro de Medeiros Lima y Andrea de Oliveira Gonçalves (Universidade de Brasília, Brasil) investigan la posibilidad de la existencia de una discontinuidad ambiental en los hospitales públicos federales de enseñanza debido a la incorporación de la Empresa Brasileira de Servicios Hospitalarios (EBSERH). La metodología de investigación fue el método de diferencias con un enfoque cuantitativo, analizando los 51 hospitales, siendo excluidos, 9. Para los autores los resultados muestran que había signos de discontinuidad en dos de las tres variables dependientes, precisamente el ingreso promedio por paciente (al 1%) y la tasa de mortalidad (al 10%).

La influencia de la desviación y de la turbulencia presupuestaria en el resultado primario de gobiernos locales es analizada por Cleonice Witt (Universidade do Contestado, Brasil), Ilse Maria Beuren (Universidade Federal de Santa Catarina, Brasil) y Nelson Hein (Universidade Regional de Blumenau, Brasil) con los datos de 230 municipios brasileños utilizando modelos lineales jerárquicos. Para los autores, la turbulencia presupuestaria parece influir negativamente en el resultado primario de los pequeños municipios y positivamente en los de mediano y gran tamaño. Y la desviación presupuestaria parece influir negativamente en los municipios de mediano tamaño y positivamente en los de pequeño y gran tamaño. Concluyen que cuando ocurren las turbulencias y desviaciones presupuestarias, el resultado primario de pequeños y medianos municipios se ve influenciado negativamente y el de los grandes municipios positivamente.

Matheus de Lima Marques y Odilanei Morais dos Santos (Universidade Federal do Rio de Janeiro, Brasil) investigan las perspectivas de los profesores brasileños de contabilidad sobre el tratamiento contable de las criptomonedas. Según los autores, los expertos establecieron un consenso moderado entre las situaciones examinadas para las circunstancias en que una entidad compra criptomonedas para sí y en los casos en que una entidad produce criptomonedas (minería). En tales circunstancias, el reconocimiento inicial debería ser un instrumento financiero y la valoración inicial y posterior al valor razonable. Este entendimiento difiere de la literatura predominante, que afirma que las criptomonedas no pueden ser reconocidas como un instrumento financiero. También hay desacuerdos sobre las valoraciones iniciales y posteriores. Como resultado, el marco regulatorio contable debe actualizarse para que las criptomonedas puedan ser reconocidas, valoradas y divulgadas de manera más fiable.

En el siguiente artículo los autores hacen una proyección del crecimiento económico mexicano ante el SARS COV-2, utilizando una función de producción Cobb-Douglas e información anual de 1980 a 2022. Para Eugenio Guzmán-Soria (Tecnológico Nacional de México); Samuel Rebollar-Rebollar (Universidad Autónoma del Estado de México); Juvencio Hernández-Martínez (Universidad Autónoma del Estado de México); Aníbal Terrones-Cordero (Universidad Autónoma del Estado de Hidalgo, México) y Nicolás Callejas-Juárez (Universidad Autónoma de Chihuahua. México), los resultados de las elasticidades de la mano de obra (0.60) y del capital (0.37) indican que, la economía mexicana tiene una relación muy estrecha con su fuerza laboral. El residuo de Solow (-10.26), que da explicación a los factores que propician el desarrollo económico de una región, derivados del progreso técnico; al ser negativo indica en parte la falta de constancia en la formación bruta de capital en México, lo cual ha repercutido en la tasa de crecimiento, aun cuando el factor laboral se haya mantenido al alza.

Los investigadores Erik Muñoz H. (Universidad de Talca, Chile), Francisco Gálvez-Gamboa (Universidad Católica del Maule, Chile) y Elmer Sánchez Dávila (Universidad Peruana de Ciencias Aplicadas, Lima, Perú) estudian la conectividad de siete mercados financieros regionales desde 2018 hasta 2023 a través de un modelo TVP-VAR. El periodo de tiempo seleccionado nos permite estudiar los efectos de la conectividad antes y después de shocks internacionales como el COVID-19 y la guerra ruso-ucraniana. Los resultados muestran que estos mercados están muy conectados, pero los resultados son heterogéneos según el choque internacional. Durante la pandemia del COVID-19, la incertidumbre mundial provocó una mayor interconexión; mientras que el conflicto bélico no tiene implicaciones significativas, pero sí aumentó la sensibilidad de los mercados regionales cercanos al conflicto armado.

Felipe Arenas-Torres, Paz Cabrera-Vargas y Michel Zamorano-Labra (Universidad de Talca, Chile) tratan de determinar la incidencia de la diversidad del consejo de administración en la implementación de prácticas de cumplimiento en las empresas chilenas. La investigación consideró 1.322 informes sobre Responsabilidad Social y Gobierno Corporativo. Los resultados indican que el grado de adopción de prácticas de cumplimiento se explica parcialmente por la diversidad en la composición de los directorios de las empresas chilenas. Asimismo, los autores concluyen que en Chile es necesario que haya mayor preocupación por parte de las autoridades en la implementación de prácticas para la composición de los directorios, y que el cumplimiento es un mecanismo cada vez más presente en el gobierno de las empresas.

De nuevo queremos agradecer a todos aquellos que hacen posible el buen funcionamiento de la revista: miembros del Consejo Consultivo, Consejo Editorial, Editores y Editores Asociados de área, evaluadores, autores, y sobre todo de los lectores.

Editor in Chief

GCG
The Journal *of* Globalization, Competitiveness, and Governability

CARTA EDITOR-CHEFE

Editor Chefe

A Revista de Globalização, Competitividade e Governança dá continuidade, com esta edição, à sua trajetória para cumprir com fidelidade e periodicidade o compromisso com nossos leitores e os critérios de qualidade aceitos internacionalmente e auditados por várias instituições. A GCG encontra-se indexada atualmente nas seguintes fontes: SCOPUS (***Elsevier Bibliogrphic Databases.*** Scimago Journal Rank), nas categorias de: Business, Management and Accountingy Economics, Econometrics and Finance; ***EconLit*** (American Economic Association's electronic bibliography); ***EBSCO Publishing´s databases (Business Source Complete; Business Source Premier; Business Source Elite; Fonte Acadêmica Premier; Fonte Acadêmica Plus); ABI/INFORM (ProQuest; LATINDEX; REDALYC; Google Scholar Metrics).*** Essa aposta na qualidade permitiu que a GCG fosse classificada como revista A (categoria mais alta) de todas as revistas espanholas de Ciências Humanas e Sociais na ***Web of Science*** e/ou SCOPUS (ISOC-CSIC).

No primeiro artigo, Victor Godeiro de Medeiros Lima e Andrea de Oliveira Gonçalves (Universidade de Brasília, Brasil) investigam a possibilidade de existência de uma descontinuidade ambiental em hospitais públicos federais de ensino devido à incorporação da Empresa Brasileira de Serviços Hospitalares (EBSERH). A metodologia de pesquisa foi o método das diferenças com abordagem quantitativa, analisando 51 hospitais, dos quais 9 foram excluídos. Para os autores, os resultados mostram que houve indícios de descontinuidade em duas das três variáveis dependentes, a saber, a média de internação por paciente (a 1%) e a taxa de mortalidade (a 10%).

Cleonice Witt (Universidade do Contestado, Brasil), Ilse Maria Beuren (Universidade Federal de Santa Catarina, Brasil) e Nelson Hein (Universidade Regional de Blumenau, Brasil) analisam a influência do desvio e da turbulência orçamentária no resultado primário dos governos locais com dados de 230 municípios brasileiros usando modelos lineares hierárquicos. Para os autores, a turbulência orçamentária parece ter uma influência negativa sobre o resultado primário dos pequenos municípios e uma influência positiva sobre o resultado primário dos municípios médios e grandes. E a derrapagem orçamentária parece influenciar negativamente os municípios de médio porte e positivamente os municípios de pequeno e grande porte. Eles concluem que, quando ocorrem turbulências e desvios orçamentários, o resultado primário dos municípios de pequeno e médio porte é influenciado negativamente e o dos municípios de grande porte, positivamente.

Matheus de Lima Marques e Odilanei Morais dos Santos (Universidade Federal do Rio de Janeiro, Brasil) investigam as perspectivas de professores de contabilidade brasileiros sobre o tratamento contábil das criptomoedas. De acordo com os autores, os especialistas estabeleceram um consenso moderado entre as situações examinadas para as circunstâncias em que uma entidade compra criptomoedas para si e nos casos em que uma entidade produz criptomoedas (mineração). Nessas circunstâncias, o reconhecimento inicial deve ser de um instrumento financeiro e a mensuração inicial e subsequente pelo valor justo. Esse entendimento difere da literatura predominante, que afirma que as criptomoedas não podem ser reconhecidas como instrumento financeiro. Também há divergências sobre as avaliações iniciais e subsequentes. Como resultado, a estrutura contábil regulatória precisa ser atualizada para que as criptomoedas possam ser reconhecidas, avaliadas e divulgadas de forma mais confiável.

No artigo a seguir, os autores projetam o crescimento econômico mexicano em face da SARS COV-2, usando uma função de produção Cobb-Douglas e dados anuais de 1980 a 2022. Para Eugenio Guzmán-Soria (Tecnológico Nacional de México); Samuel Rebollar-Rebollar (Universidad Autónoma del Estado de México); Juvencio Hernández-Martínez (Universidad Autónoma del Estado de México); Aníbal Terrones-Cordero (Universidad Autónoma del Estado de Hidalgo, México) e Nicolás Callejas-Juárez (Universidad Autónoma de Chihuahua. México), os resultados das elasticidades da mão de obra (0,60) e do capital (0,37) indicam que a economia mexicana tem uma relação muito próxima com sua força de trabalho. O resíduo de Solow (-10,26), que explica os fatores que favorecem o desenvolvimento econômico de uma região, derivados do progresso técnico, sendo negativo, indica, em parte, a falta de constância na formação bruta de capital no México, o que teve um impacto sobre a taxa de crescimento, mesmo quando o fator trabalho esteve em alta.

Os pesquisadores Erik Muñoz H. (Universidad de Talca, Chile), Francisco Gálvez-Gamboa (Universidad Católica del Maule, Chile) e Elmer Sánchez Dávila (Universidad Peruana de Ciencias Aplicadas, Lima, Peru) estudam a conectividade de sete mercados financeiros regionais de 2018 a 2023 por meio de um modelo TVP-VAR. O período de tempo selecionado nos permite estudar os efeitos da conectividade antes e depois de choques internacionais, como a COVID-19 e a guerra russo-ucraniana. Os resultados mostram que esses mercados são altamente conectados, mas os resultados são heterogêneos dependendo do choque internacional. Durante a pandemia da COVID-19, a incerteza global levou a uma maior interconectividade; já o conflito bélico não teve implicações significativas, mas aumentou a sensibilidade dos mercados regionais próximos ao conflito armado.

Felipe Arenas-Torres, Paz Cabrera-Vargas e Michel Zamorano-Labra (Universidad de Talca, Chile) buscam determinar o impacto da diversidade do conselho na implementação de práticas de conformidade em empresas chilenas. A pesquisa considerou 1.322 relatórios sobre Responsabilidade Social e Governança Corporativa. Os resultados indicam que o grau de adoção de práticas de conformidade é parcialmente explicado pela diversidade da composição do conselho em empresas chilenas. Os autores também concluem que no Chile há necessidade de maior preocupação por parte das autoridades na implementação de práticas para a composição dos conselhos de administração, e que o compliance é um mecanismo cada vez mais presente na governança corporativa.

Queremos, mais uma vez, agradecer a todos os que tornam possível o bom funcionamento da revista: aos membros do Conselho Consultivo, ao Conselho Editorial, Editores e Editores Associados da área, avaliadores, autores e, principalmente, aos leitores.

Editor
Chefe

GCG
The Journal *of* Globalization, Competitiveness, and Governability

SUMARIO | SUMMARY | SUMÁRIO

1 Effects of Environmental Discontinuity on the Performance of Teaching Hospitals in Brazil — 20-32
Efeitos da descontinuidade de ambiente no desempenho dos hospitais de ensino no brasil
Efectos de la discontinuidad ambiental en el desempeño de los hospitales de enseñanza en brasil
Victor Godeiro de Medeiros Lima & Andrea de Oliveira Gonçalves

2 Influência do Desvio e da Turbulência Orçamentária no Resultado Primário de Governos Locais — 33-48
Influencia de la desviación y turbulencia presupuestaria en el resultado primario de los gobiernos locales
Influence of deviation and budgetary turbulence in the primary outcome of local governments
Cleonice Witt, Ilse Maria Beuren e Nelson Hein

3 Cryptocurrencies Accounting Treatment — 49-62
Tratamento Contábil das Criptomoedas
Tratamiento Contable de las Criptomonedas
Matheus de Lima Marques & Odilanei Morais dos Santos

4 El Crecimiento Económico en México Después del SARS Cov-2 — 63-80
Economic Growth in Mexico After SARS Cov-2
Crescimento Econômico no México Após SARS Cov-2
Eugenio Guzmán-Soria, Samuel Rebollar-Rebollar, Juvencio Hernández-Martínez, Aníbal Terrones-Cordero y Nicolás Callejas-Juárez

5 Connectedness Between Regional Financial Markets: Evidence from Covid-19 and Russia-Ukraine Conflict — 81-92
Conectividad Entre los Mercados Financieros Regionales: Evidencia del Covid-19 y el Conflicto Rusia-Ucrania
Conectividade Entre os Mercados Financeiros Regionais: Dados da Covid-19 e do Conflito Rússia-Ucrânia
Erik Muñoz H., Francisco Gálvez-Gamboa & Elmer Sánchez Dávila

6 Board Diversity and Compliance Practices — 93-106
Diversidad del Consejo de Administración y Prácticas de Compliance
Diversidade do Conselho de Administração e Práticas de Compliance
Felipe Arenas-Torres, Paz Cabrera-Vargas & Michel Zamorano-Labra

GCG

The Journal *of* Globalization, Competitiveness, and Governability

STAFF

CONSEJO CONSULTIVO / ADVISORY BOARD / CONSELHO CONSULTIVO

CONSEJO EDITORIAL / EDITORIAL BOARD / CONSELHO EDITORIAL

6. RESPONSABILIDAD SOCIAL CORPORATIVA: INNOVACIÓN SOCIAL Y CREACIÓN DE EMPRESAS / CORPORATE SOCIAL RESPONSIBILITY: RESPONSIBLE ENTREPRENEURSHIP AND SOCIAL INNOVATION / RESPONSABILIDADE SOCIAL CORPORATIVA: INOVAÇÃO SOCIAL E CRIAÇÃO DE EMPRESAS

GCG
The Journal *of* Globalization, Competitiveness, and Governability

SELECCIÓN | PROCEDURE | PROCEDIMENTO

INSTRUCCIONES PARA AUTORES Y PROCEDIMIENTO DE SELECCIÓN

La revista esta dirigida a quienes tienen la responsabilidad de gobernar empresas o dirigir organismos e instituciones públicas o privadas para proporcionarles ideas originales y propuestas innovadoras que contribuyan a la mejora de la competitividad y gobernabilidad de las empresas y los países iberoamericanos en un mundo globalizado. La revista también aspira a servir a la comunidad universitaria y científica de la región como publicación de referencia sobre nuevas ideas. Para ello facilitará la comunicación entre las distintas comunidades universitarias iberoamericanas, las acercará y las articulará alrededor del estudio de áreas concretas, debidamente analizadas mediante aportaciones teóricas, aplicaciones prácticas y estudio de casos reales.

Miembros del mundo universitario, empresarial e institucional podrán remitir sus trabajos originales, no postulados simultáneamente en otras publicaciones, para que sean evaluados y eventualmente publicados en la revista. Los autores que aspiren a la publicación de sus artículos deberán someterse a las siguientes normas:

- Los artículos deben ser inéditos.

- Los trabajos podrán escribirse en español, portugués o inglés. Su extensión será entre 4500 y 5000 palabras. Sin embargo, se admitirá cierta flexibilidad atendiendo a la naturaleza del tema abordado.

- Cada artículo deberá ir precedido de un resumen ejecutivo de no más de cien palabras en el idioma en que ha sido escrito originalmente. Adicionalmente se incluirá la categoría en las que se sitúa el artículo: una de las seis áreas (6) y perspectiva desde la cual se aborda el tema (Teoría, Aplicación y Casos). Además, se incorporará la clasificación del trabajo conforme a los descriptores utilizados por el Journal of Economic Literature.

- El nombre del autor/es no podrá aparecer en ninguna de las hojas del artículo. Ello facilita el proceso de evaluación, pues los datos se incorporarán en el formulario digital.

- Los originales deben incorporar el título del trabajo. Dichos originales estarán editados electrónicamente en formato "Word" o compatible, y se enviarán por vía electrónica (*gcgjournal.georgetown.edu*). Los autores rellenarán sus datos en la ficha electrónica, especificando el área de estudio. Tan pronto como los autores introduzcan la información completa en el formulario de gestión de artículos, se les enviará acuse de recibo de la recepción de su trabajo.

- Las referencias bibliográficas se incluirán en el texto indicando el nombre del autor, fecha de publicación, letra y página. La letra, a continuación del año, sólo se utilizará en caso de que se citen obras de un autor pertenecientes a un mismo año. Se incluirán, al final del trabajo, las obras citadas en el texto atendiendo a la información requerida en las normas ISO 690/1987 y su equivalente UNE 50-104-94 que establecen los criterios a seguir para la elaboración de referencias bibliográficas:

  Libros: Dornier, P.P.; Ernst, R.; Fendel, M.; Kouvelis, P; (1998), "Global Operations and Logistics: Text and Cases", John Wiley & Son, New Jersey.
  Artículos: Campa, J.M.; Guillen, M. (1999), "The Internalization of Exports: Ownership and

Location-Specific Factors in a Middle-Income Country", Management Science, Vol. 45, Num. 11, pp. 1463-1478
Artículos con DOI's: Cuervo-Cazurra, A.; Un, C. A. (2007).- "Regional economic integration and R&D investment", Research Policy, Vol. 36, Num. 2, pp. 227-246. doi:10.1016/j.respol.2006.11.003

- La revista se reserva la facultad de editar formalmente los artículos, y de separar y recuadrar determinadas porciones del texto particularmente relevantes, aunque respetando siempre el espíritu del original. Los autores tendrán oportunidad de autorizar el formato final de los artículos antes de su publicación.

- Los autores deberán estar en disposición de ceder los beneficios derivados de sus derechos de autor a la revista.

- Corresponde al Editor en Jefe determinar si el artículo es admisible para su publicación. En caso de que así sea, lo enviará al director de área correspondiente, quien iniciará a su vez el proceso de evaluación.

- Cada artículo será sometido a consideración anónima de al menos 2 evaluadores, expertos externos a la entidad editora de la revista y a su consejo de editorial.

- La revista se compromete a responder a los autores con una decisión editorial en un plazo aproximado de tres meses (primera evaluación).

- La lista de evaluadores se hará pública anualmente.

INSTRUCTIONS FOR AUTHORS AND PROCEDURE

The journal is aimed at the people with responsibility for governing companies or managing public or private sectors and institutions. Its goal is to provide such people with original ideas and innovative proposals to help improve the competitiveness and governability of companies and the Ibro-American countries in a globalized world. The journal also aims to serve the region's academic and scientific communities by becoming the publication of reference for new ideas. It will do this by facilitating communication among the various Ibero-American academic communities, bringing them closer together and structuring them around the study of specific areas, duly analyzed by means of theoretical contributions, practical applications, and real case studies.

Original papers may be submitted for evaluation and potential publication in the journal by members of the academic, business and institutional spheres. Authors hoping to publish their articles must adhere to the following rules:

- The articles must be previously unpublished.

- The papers may be written in Spanish, English or Portuguese and must be between 4,500 and

5,000 words long, although this may be subject to a certain degree of flexibility depending on the nature of the subject.

- Each article must be preceded by an abstract of no more than one hundred words in the original language of the article. The category in which the article is ncluded must also be specified: area of knowledge (6) and perspective from which the subject is being addressed (theory, application, case study). You must also state how the work is classified according to the Journal of Economic Literature's descriptors.

- The author's or authors' name(s) may not appear anywhere in the article. This facilitates the evaluation process since the data will be included in the digital form.

- The title of the work must be included in the original. Originals must be presented in digital format – either in Word or in a Word-compatible format – and be sent electronically (*gcgjournal.georgetown.edu*). Authors must fill out their details on the electronic record, specifying the area under study. Authors will receive an acknowledgement of receipt of their work as soon as they have entered all the information in the article management form.

- Bibliographic references must be included in the text, indicating the author's name, date of publication, letter and page. Years must be followed by a letter only when citing works by the same author and from the same year. Works mentioned in he text must be cited at the end of the article as stipulated in the ISO 690/1987 standard and its equivalent Spanish standard UNE 50-104-94, which lay down the criteria for presenting bibliographic references:

> Books: Dornier, P.P.; Ernst, R.; Fendel, M.; Kouvelis, P; (1998), "Global Operations and Logistics: Text and Cases", John Wiley & Son, New Jersey.
> Papers: Campa, J.M.; Guillen, M. (1999), "The Internalization of Exports: Ownership and Location-Specific Factors in a Middle-Income Country", Management Science, Vol. 45, Num. 11, pp. 1463-1478
> Papers with DOI's: Cuervo-Cazurra, A.; Un, C. A. (2007).- "Regional economic integration and R&D investment", Research Policy, Vol. 36, Num. 2, pp. 227-246. doi:10.1016/j.respol.2006.11.003

- The journal reserves the right to formally edit the articles and to separate particularly relevant parts thereof and put them in boxes, always in accordance with the spirit of the original. Authors will be given the chance to authorize the final format of their articles prior to publication.

- Authors must be willing to assign all the benefits of their copyright to the journal.

- Responsibility for deciding whether the article is fit for publication lies with the Editor-in-Chief. If this is the case, the Editor-in-Chief will send it to the relevant area director.

- Each article shall be subject to consideration on an anonymous basis by at least 2 expert assessors not belonging to the magazine's publisher or to its editorial board.

- The journal undertakes to notify authors of an editorial decision within approximately three months (first evaluation).

- The list of referees will be published on an annual basis.

INSTRUÇÕES PARA AUTORES E PROCEDIMENTO DE SELECÇÃO

A revista é dirigida a quem tem a responsabilidade de administrar empresas ou dirigir organismos e instituições públicas ou privadas para lhes proporcionar ideias originais e propostas inovadoras que contribuam para a melhoria da competitividade e governabilidade das empresas e dos países ibero-americanos num mundo globalizado. A revista aspira igualmente a servir a comunidade universitária e científica da região, como publicação de referência sobre novas ideias. Para isso irá facilitar a comunicação entre as diferentes comunidades universitárias ibero-americanas, irá aproximá-las e articulá-las à volta do estudo de áreas concretas, devidamente analisadas através de contribuições teóricas, aplicações práticas e estudo de casos reais.

Membros do mundo universitário, empresarial e institucional poderão enviar trabalhos originais para serem avaliados e eventualmente publicados na revista. Os autores que desejem publicar os seus artigos deverão submeter-se às seguintes normas:

- Os artigos devem ser inéditos.

- Os trabalhos podem ser escritos em espanhol, português ou inglês. A sua extensão deverá ser entre 4500 e 5000 palavras. No entanto, será admitida uma certa flexibilidade, atendendo à natureza do tema abordado.

- Cada artigo deverá ser precedido de um resumo com o máximo de cem palavras na língua em que tenha sido escrito originalmente. Adicionalmente será incluída a categoria na qual se situa o artigo: uma das seis (6) áreas e perspectiva a partir da qual o tema é abordado (Teoria, Aplicação e Casos). Será, além disso, incorporada a classificação do trabalho de acordo com as descrições utilizadas pelo Journal of Economic Literature.

- O nome do(s) autor(es) não poderá aparecer em nenhuma das páginas do artigo. Isso facilita o processo de avaliação, pois os dados serão introduzidos no formulário digital.

- Os originais devem conter o título do trabalho. Estes originais serão editados electronicamente em formato «Word» ou compatível, e serão enviados por via electrónica (*gcgjournal.georgetown.edu*). Os autores preencherão os seus dados na ficha electrónica, especificando a área do estudo. Logo que os autores introduzem a informação completa no formulário de gestão de artigos, é-lhes enviado um aviso de recepção do seu trabalho.

- As referências bibliográficas serão incluídas no texto, indicando o nome do autor, a data da publicação, título e página. A letra, a seguir ao ano, só será utilizada caso sejam citadas obras de um autor pertencentes a um mesmo ano. Serão incluídas, no final do trabalho, as obras citadas no texto, considerando a informação requerida nas normas ISO 690/1987 e equivalente UNE 50-104-94, que estabelecem os critérios a seguir para a elaboração de referências bibliográficas:

  Livros: Dornier, P.P.; Ernst, R.; Fendel, M.; Kouvelis, P; (1998), "Global Operations and Logistics: Text and Cases", John Wiley & Son, New Jersey.
  Artigos: Campa, J.M.; Guillen, M. (1999), "The Internalization of Exports: Ownership and Location-Specific Factors in a Middle-Income Country", Management Science, Vol. 45, Num. 11, pp. 1463-1478

Artigos com DOI (Identificador de Objecto Digital): Cuervo-Cazurra, A.; Un, C. A. (2007).- "Regional economic integration and R&D investment", Research Policy, Vol. 36, Num. 2, pp. 227-246. doi:10.1016/j.respol.2006.11.003

- A revista reserva-se a faculdade de editar formalmente os artigos, e de separar e reenquadrar determinadas porções do texto particularmente relevantes, embora respeitando sempre o espírito do original. Os autores terão oportunidade de autorizar o formato final dos artigos antes da respectiva publicação.

- Os autores deverão estar disponíveis para ceder os benefícios derivados dos seus direitos de autor à revista.

- Incumbe ao Editor Chefe determinar se o artigo é admissível para publicação. Caso assim seja, irá enviá-lo ao director da área correspondente que, por sua vez, iniciará o processo de avaliação.

- Cada artigo será submetido a consideração anónima de pelo menos 2 avaliadores, especialistas exteriores à entidade editora da revista e ao seu conselho editorial.

- A revista compromete-se a responder aos autores com uma decisão editorial num prazo aproximado de três meses (primeira avaliação).

- A lista de avaliadores será tornada pública anualmente.

Enviar los Artículos / Submit articles / Enviar os Artigos:
gcgjournal.georgetown.edu

Consultas / Suggestions / Consultas:
gcgjournal@gmail.com

GCG
The Journal *of* Globalization, Competitiveness, and Governability

INDEXACIÓN | INDEXING | INDEXAÇÃO

INDICIOS DE CALIDAD DE LA REVISTA DE GLOBALIZACIÓN, COMPETITIVIDAD Y GOBERNABILIDAD (GCG)

GCG: Revista de Globalización, Competitividad y Gobernabilidad está indexada y presente en los siguientes catálogos y bases de datos:

- EconLit (American Economic Association)

- *SCOPUS (Elsevier Bibliografhic Databases).* SJR Impact Factor (2015): 0,159 Q3 (posición 177 de 285, *Subject Category: Business, Management and Accounting (miscellaneous); Economics, Econometrics and Finance (miscellaneous) (posición 170 de 269)(julio 2016)*

- DICE (Difusión y Calidad Editorial de las Revistas Españolas de Humanidades, Ciencias Sociales y Jurídicas, CSIC-ANECA). Area Economía. Cumpliendo el 100% de los criterios de calidad auditados

- Directorio, CATÁLOGO e Indice LATINDEX (cumpliendo el 100% de los 33 criterios de calidad)

- RESH (Revistas Españolas de Ciencias Sociales y Humanidades)

- *Google Scholar Metric (2011-2015). Indice H de las Revistas Científicas Españolas (julio 2016). Indice H: 6; Posición 7 de 49 revistas en "Ciencia Política y de la Administración". Posición 24 de 87 revistas en "Economía y Empresa"*

- IN-RECS (Indice de impacto de revistas españolas de ciencias sociales)

- EBSCO Publishing's databases

- ABI/Inform ProQuest

- Ulrich's Periodicals Directory

- ISOC-Ciencias Sociales y Humanidades (CSIC)

- DIALNET

- DOAJ (Directory of Open Access Journals)

- REDIB

Latin America Leadership Program
GEORGETOWN UNIVERSITY

ISSN: 1988-7116

GCG
The Journal *of* Globalization, Competitiveness, and Governability

Effects of Environmental Discontinuity on the Performance of Teaching Hospitals in Brazil

AREA: 1
TYPE: Application

Efeitos da Descontinuidade de Ambiente no Desempenho dos Hospitais de Ensino no Brasil
Efectos de la Discontinuidad Ambiental en el Desempeño de los Hospitales de Enseñanza en Brasil

AUTHORS

Victor Godeiro de Medeiros Lima[1]
Universidade de Brasília – UnB, Brasil
victor_godeiro@hotmail.com

Andrea de Oliveira Gonçalves
Universidade de Brasília – UnB, Brasil
andreaegoncalves@gmail.com

1. Corresponding author: Faculdade de Economia, Administração, Contabilidade e Gestão de Políticas Públicas; Universidade de Brasília; Campus Darcy Ribeiro - Prédio da FACE, Asa Norte, CEP: 70910-900 - Brasília - DF

This research investigates the possibility of the existence of an environmental discontinuity in federal public teaching hospitals due to their incorporation by the state-owned Brazilian Company of Hospital Services - EBSERH. The difference-in-differences method was used with a quantitative approach. 51 hospitals were analyzed, being excluded 9 from the final sample. The results showed that there were signs of discontinuity in two of the three dependent variables, precisely the average revenue per patient (at 1%) and the mortality rate (at 10%).

Essa pesquisa investiga a possibilidade de existência de uma descontinuidade ambiental nos hospitais de ensino públicos federais em razão da incorporação da Empresa Brasileira de Serviços Hospitalares - EBSERH. Utilizou-se, com abordagem quantitativa, o método difference-in-differences. *Foram analisados os 51 hospitais, sendo excluídos 9 da amostra final. Os resultados demonstraram haver indícios de descontinuidade em duas das três variáveis dependents, precisamente a receita média por paciente (a 1%) e a taxa de mortalidade (a 10%).*

Este estudio investiga la posibilidad de la existencia de una discontinuidad ambiental en los hospitales públicos federales de enseñanza debido a la incorporación de la Empresa Brasileira de Servicios Hospitalarios - EBSERH. Se utilizó el método de diferencias en diferencias con un enfoque cuantitativo. Se analizaron los 51 hospitales, siendo excluidos, 9. Los resultados mostraron que había signos de discontinuidad en dos de las tres variables dependientes, precisamente el ingreso promedio por paciente (al 1%) y la tasa de mortalidad (al 10%).

DOI
10.58416/GCG.2024.V18.N1.01

Received
07.10.2022

Accepted
10.06.2023

GCG
The Journal *of* Globalization, Competitiveness, and Governability

1. Introduction

The EBSERH (*Empresa Brasileira de Serviços Hospitalares*), or Brazilian Company of Hospital Services, was created as part of a movement that began in Brazil, in the 1990s, by President Fernando Henrique Cardoso, which aimed to reduce bureaucracy and reform the Brazilian public administration, causing a rupture with the neoliberal policy of former President Fernando Collor and instituting progressive market-oriented policies (Gonçalves *et al.*, 2017).

This plan had as guidelines many of the basic lines of the *New Public Management* (NPM) and was later adopted by several state governments (Sano & Abrucio, 2008). As Paula (2005) says, Managerial Public Administration – as it became known in Brazil, in its adapted model – would focus on administrative decentralization, discipline and parsimony in the use of resources, transparent performance indicators and greater emphasis on results, among others.

Naturally, this reform process also extended to the health sector, due to the growing increase in spending in most developed countries due to population aging and technological progress (Simonet, 2013b). Whether directly by the government, or on the hospitals' own initiative, the changes took place for financial or regulatory reasons through the willingness of legislators and regulators to improve the performance of hospitals (Schreÿogg, 2019).

The situation also affected public teaching hospitals which, in the context of reforms, saw the scenario change with the creation of EBSERH. The company was created with the purpose of establishing contracts with hospitals, influencing management, financing and their objectives, including improving and monitoring their performance (Andreazzi, 2013, EBSERH, 2016).

The creation of EBSERH to better manage those hospitals was encouraged because over the years the health sector has become one of the fastest growing and most expensive sectors, in addition to representing a large part of a country's economy (Shukri & Ramli, 2015), as one of the service sectors (Rahimi *et al.*, 2017).

In addition to their importance, health organizations deal with an unstable environment due to the constant changes in lifestyle, demographic and technological factors that they have to face (Koumpouros, 2013). Bahadori *et al.* (2011) add that hospitals occupy a prominent place in health systems, and the evaluation of their performance is extremely important due to their contribution to the effectiveness of the system. But what would performance be in the hospital context?

Schreyögg (2019) classifies two strands in the literature on hospital performance: a strand of medical researchers, which focuses on quality of care and its processes and results; and another strand of researchers in the economic area. Studying hospitals regarding their performance aspect deserves particular attention due to the increase in demand for services and the high expectations of patients, which has been causing financial difficulties in countries around the world, such as Europeans (Eiff, 2012) and Asian countries (*World Bank*, 2010).

Several projects and various tools were employed and developed to improve performance and quality of care to overcome these challenges in healthcare organizations. However, due to the competitive market, it became particularly difficult for hospitals to remain operating alone in the

Keywords
Teaching hospitals; EBSERH; Environmental discontinuity.

Palavras-chave
Hospitais de ensino; EBSERH; Descontinuidade de ambiente.

Palabras clave
Hospitales universitarios; EBSERH; Discontinuidad del entorno.

JEL codes
C33, H11, H51

market, which encouraged them to cooperate with other organizations or to incorporate other hospitals. This multi-institutional arrangement process would be able to reduce costs (reduction of redundant activities) and increase efficiency due to economies of scale (purchases in greater numbers) (Schreyögg, 2019).

Büchner, Hinz and Schreyögg (2016) highlight that this type of system makes it easier for hospitals to hire employees, increase employees' skills through the exchange of information and expertise, have access to capital and financial services with more agility and greater bargaining power.

There are basically three types of multi-institutional arrangements: health systems, health networks and co-optation. Health systems consist of multiple hospitals that operate under the direction of a key organization (such as EBSERH and the focus of this paper); health networks are about strategic and contractual alliances between hospitals and other health organizations to provide a diversified range of services; co-option is defined by a single link between organizations, such as the presence of a board member in two hospitals simultaneously (Schreyögg, 2019).

Büchner, Hinz and Schreyögg (2016) used the difference-in-differences method to examine financial indicators of German hospitals and showed that, one year after entering health systems, there was a positive effect on hospital performance, an effect that disappeared in following the following years, which leads to the conclusion that there is no clear evidence that this entry has a lasting impact.

When reviewing the effects of entry into health systems on hospital efficiency and performance, Schreyögg (2019) concludes that there is indeed an expected increase in efficiency, but the effects on financial performance are unclear, which compels further investigations. According to this same author, in general, surprisingly few studies have examined the effect of changes in applicable regulations on hospital performance, which is precarious when compared to other lines of research in health economics.

In addition to the lack of consensus regarding the effects of changes in the regulation of hospital performance and the comparatively low number of studies on the subject, there is still more scientific production on the subject in developed countries than in developing countries, a group that includes Brazil, according to the United Nations (2019).

Schreyögg (2019) goes further by stating that, when specifically dealing with the performance of hospitals that experience environmental discontinuity, the academic literature is inconclusive about its effects, which encourages further investigation.

It is believed, therefore, that the Brazilian case can be used as an example for other developing countries due to its similarities (Mimba *et al.*, 2007) and the considerable number of public teaching hospitals due to its territorial dimensions.

Considering the context of organizational changes that causes turbulence and the few studies on the subject, it is stated the following research problem: **how did the contractualization by the EBSERH affect the performance of teaching hospitals?** The present study has the general objective of analyzing how the contractualization by the EBSERH affected the performance of university hospitals.

2. Theoretical Framework

2.1. Environmental Discontinuity

For 40 years, researchers have sought to understand how companies in increasingly unpredictable environments can manage the present and prepare for the future (Liebl, Schwarz, 2010). Organizational theorists who adopt the punctuated equilibrium perspective propose the existence of two distinct phases in the evolution of organizations: long periods of quasi-equilibrium, marked by small changes in activities and structure, and periods of disequilibrium in which new organizations emerge and existing ones. are transfigured (Haveman, Russo, & Meyer, 2001).

These periods of imbalance receive different denominations, being called periods of crisis, turbulence and environmental discontinuity (Hambrick & Mason, 1984; Haveman, Russo, & Meyer, 2001; Domadenik, Prašnikarm, & Svejnar, 2016). This study adopts the nomenclature of environmental discontinuity, which, according to Hoppman, Naegele and Girod (2019), consists of significant changes in a company's political, technological, social or economic environment.

It should be noted that, in situations of environmental discontinuity, the existing capabilities of a company can become obsolete, which demands the adaptation of strategic planning in order not to harm its performance (Hayne, 2022). This inability to adapt may result from organizational inertia, with top management teams having a vital role in preventing this effect. Despite its relevance, more studies are needed about the internal challenges and the dynamics in environmental discontinuity (Hoppmann, Naegele, & Girod, 2019).

For the purposes of this study, the privatization process of federal public teaching hospitals is considered to trigger a process of environmental discontinuity, due to the various changes in the organizational environment, with new top managers, a new hierarchical structure and the establishment of new performance indicators.

The privatization of public teaching hospitals to private, for-profit or non-profit hospitals, has been one of the strategies adopted by governments whose hospitals are facing financial problems (Ramamonjiarivelo, Weech-Maldonado, Hearld, Menachemi, Epané, & O'Connor, 2015). The study by Ramamonjiarivelo *et al.* (2020) highlights some points emphasized by the literature as possible motivators of this change, such as increased efficiency, reduction of operating costs, recruitment of new managers and employees, renovation of infrastructure, among other factors. The authors point out that, although part of the literature argues that privatization can force hospitals to discontinue certain services to the population or harm the quality of their performance, this option would be a way of keeping them running and that, if they are not privatized, they could close.

Turning to empirical studies on the subject, Thorpe, Florence and Sieber (2000) investigated the impact of changes in relation to the type of control of hospitals regarding their financial performance and found no significant change in *total margin* after privatization to an institution. non-profit private. In the study by Villa and Kane (2013), the authors also did not find a significant variation after privatization in *the total margin*, but observed a 6.1% increase in *the operating margin*.

Other studies have found an association between change and hospital performance. Bazzoli *et al.* (2000), when studying the nine performance indicators in North American hospitals, showed that hospitals in moderately centralized health systems perform better than those in other types of institutional arrangements. Carey (2003) demonstrates the existence of a positive association between entry into a health system and cost efficiency. Büchner *et al.* (2015), using the difference-in-differences, reported that the technical efficiency of German hospitals entering healthcare systems increased in the fourth year.

3. Methodology

3.1. Universe and Sample

The research universe consists of federal teaching university hospitals, totaling 51 organizations whose data were available for the analyzed period. The only institution disregarded was the University Hospital of UNIFAP, as it is still under construction and pending operation, despite having already been contracted in the period.

3.1.1 Sample organization for the difference-in-differences method

The difference-in-differences method estimation is the most common and oldest quasi-experimental research design and consists of the analysis of variance in results before and after treatment (difference 1) and between the control and treatment group (difference 2) (Goodman-Bacon, 2021).

In order to carry out the procedure as planned for detecting the environmental discontinuity, the sample also used federal university hospitals that were not incorporated by the EBSERH as a control group. They are:

Table 1. - Federal University Hospitals not Incorporated by EBSERH

Hospital Universitário da UNIFESP	Hospital Universitário Clementino Fraga Filho
Instituto de Atenção à Saúde São Francisco de Assis	Instituto de Puericultura e Pediatria Martagão Gesteira
Maternidade Escola da UFRJ	Instituto de Ginecologia da UFRJ
Instituto de Neurologia Deolindo Couto	Instituto de Psiquiatria da Universidade do Brasil
Instituto de Doenças do Tórax	Instituto do Coração Edson Saad

Therefore, excluding the federal university hospitals presented above, the analysis was performed according to **Table 5**, below.

Table 2. - Hospitals used for *difference-in-differences*

Treatment group	HU Maria Aparecida Pedrossian; HU Júlio Müller; HU de Brasília; HU da UFGD; Hospital Universitário da UFPI; HU Professor Alberto Antunes; HU Professor Edgard Santos; Maternidade Climério de Oliveira; Hospital Universitário Walter Cantídio; Maternidade Escola Assis Chateaubriand; HU da UFMA; HU Lauro Wanderley; Hospital das Clínicas da UFPE; HU da Un. Federal do Vale do São Francisco; Hospital Universitário Ana Bezerra; Hospital Universitário Onofre Lopes; Maternidade Escola Januário Cicco; Hospital Universitário da UFS; Hospital Universitário Getúlio Vargas; HU Betinna Ferro de Souza; Hospital Universitário João de Barros Barreto; HU Cassiano Antônio Moraes; Hospital das Clínicas da UFMG; Hospital das Clínicas da UFTM; e Hospital Universitário de Santa Maria (Total = 25 hospitals)
Control group	HU Alcides Carneiro; HU Júlio Maria Bandeira de Mello; Hospital Universitário de Lagarto; Hospital de Doenças Tropicais; Hospital de Clínicas da UFU; Hospital Universitário Antônio Pedro; Hospital Universitário Gaffrée Guinle; HU Prof. Polydoro Ernani de São Thiago; Hospital Universitário Dr. Miguel Riet Corrêa Jr.; HU da UNIFESP; HU Clementino Fraga Filho; Instituto de Atenção à Saúde São Francisco de Assis; Instituto de Puericultura e Pediatria Martagão Gesteira; Maternidade Escola (UFRJ); Instituto de Ginecologia (UFRJ); Instituto de Neurologia Deolindo Couto (UFRJ); e Instituto de Psiquiatria da Universidade do Brasil (Total = 17 hospitals)
Hospitals not included	Hospital das Clínicas da UFG; Hospital Universitário da UFSCar; Hospital Universitário de Juiz de Fora; Hospital Escola da UFPel; Hospital de Clínicas da UFPR; Maternidade Victor Ferreira do Amaral; Instituto de Doenças do Tórax (UFRJ); e Instituto do Coração Edson Saad (Total = 8 hospitals)

The selection criteria for hospitals were as follows:

- treatment group hospitals – were selected due to the incorporation date as the contract with EBSERH was signed in 2013;
- control group hospitals – were selected considering that in the period of analysis they were not contracted by the EBSERH (this includes hospitals that were not contracted by the EBSERH at all, such as HU Clementino Fraga Filho (UFRJ), and hospitals that were contracted in periods subsequent to the analysis, such as the Hospital de Clínicas of the UFU; and
- hospitals that were not included - they were excluded from the analysis due to the unavailability of data (eg Instituto de Atenção à Saúde São Francisco de Assis - UFRJ) or due to the contract with EBSERH on a different date from 2013, but still within of the period of analysis (eg Hospital de Clínicas, UFPR).

3.2. Performance Indicators

Regarding the variables available for the analysis of the environmental discontinuity, the study by Brizola *et al.* (2011) was used as reference. The variables that were found to be valid for use, considering their characteristics of data availability and relevance to the object of the study are the *mean value of AIH (hospital admission authorization);* the *average length of stay*; and the *death rate*.

As for the availability of data, the Brazilian literature uses the data provided by the federal government to calculate other indicators considered relevant, since they are evidenced by the EBSERH itself through its Budget and Financial Information Panel (EBSERH, 2021) and other bases maintained directly by the Ministry of Health, such as DATASUS and CNES.

Specifically, regarding the variables used, it is important to emphasize that they are available with monthly observations for the analyzed period and allow the demonstration of the discontinuity, in general aspects, faced by hospitals. The following table demonstrates the data sources used:

Table 3. - Data collection sites for selected hospital financial performance variables

data source	Source Description
DATASUS	It provides data on the financial and budgetary execution of health systems obtained through SIOPS, in addition to consolidating data from other sources. Its website is <http://www2.datasus.gov.br/>
Budget and Financial Information Panel - EBSERH	The panel provides information on university hospitals based on *Business Intelligence* (BI) concepts with data mainly from SIAFI. This tool is provided for in article 54 of the EBSERH Internal Regulation and its maintenance is one of the competences of the company's Budget and Finance Department.
CNES	Maintained by the Ministry of Health, by its Health Care Secretariat, the database maintains data on health facilities, such as beds, equipment and contracts. Its website is <http://cnes2.datasus.gov.br/>

With the definition of indicators that serve as a basis for measuring the performance of hospitals, we proceed to explain the methodological procedures that involved the detection of discontinuity in the environment.

3.3. Detection of Environment Discontinuity

The literature is still not certain as to whether the effects are positive or negative, and some papers use the methodological approach of difference-in-differences, propensity score matching or instrumental variables to analyze each situation (Schreyögg, 2019).

For the regression analysis, it was proceeded to the composition of three econometric models where the three different dependent variables for each model were considered.

The difference-in-differences method model used, adapted from Büchner, Hinz and Schreyögg (2016), has the following basic structure:

$$Y_{it} = X_0 + X_1 SYSTEM_i + X_2 POST_t + X_3 SYSTEM_i POST_t + X_4 Z_{it} + e_{it} \quad \text{(Eq. 1)}$$

Apart from the already explained dependent variables, which represent the performance of hospital *i* in month t, the study considers the dummy variable $SYSTEM_t$ with value 1 if the hospital entered the EBSERH in the period and 0 in negative cases; the *dummy* variable $POST_t$ assumes a value of 1 from the year following the entry of hospitals into the health system and 0 before and in the year of entry.

Next, the interaction coefficient between the two *dummies* listed above is presented, which is the $SYSTEM_t POST_t$, whose function is to indicate potential changes in the performance of hospitals after joining the EBSERH in relation to hospitals that were not incorporated, therefore belonging to the group of control. This coefficient is responsible for capturing the effect sought.

Z represents the control variables used in the models, which are two: the first corresponds to the number of employees and the second to the number of beds in hospital *i* in month *t*. The error term *e* is assumed to be of zero mean and normally distributed.

It is emphasized that, as a temporal delimitation, monthly observations were used from January 2008 (oldest data available in the DATASUS database) to December 2015, organized as follows: the year 2013, as the year with the highest number of contracts, was considered the treatment period for the hospitals in the sample. Therefore, the study considered the months of 2014 and 2015 as post-treatment and the months from 2008 to 2012 as pre-treatment.

This delimitation is necessary due to the availability of data, since some hospitals were contracted between the years 2016 and 2019, making them, if considered, to belong to the treatment group. The two-year window was arbitrated following studies such as Büchner *et al.* (2016). Even if the period of panel data is longer (extends to 2019), the assumption is that the results found in the diff-in-diff persist once the environmental discontinuity persists. Büchner *et al.* (2015), for example, report effects of contractualization on efficiency after four years of entry into health systems.

It is necessary to emphasize that the year 2020 caused another environmental discontinuity that is not subject to analysis in this study. The COVID-19 pandemic caused several crises that led to closures, mergers and restructurings (Nguyen, Malik, Budhwar, 2022; Schaedler, Graf-Vlachy, König, 2022). Consequently, it caused changes in hospital data and, therefore, data after the event are not used.

4. Results Analysis

4.1. Environmental Discontinuity

As discussed in the methodology, environmental discontinuity was calculated for three distinct variables, namely *average revenue per patient, average length of stay* and *mortality rate*. It was expected to identify the variation in these indicators in relation to the contracting or not of university hospitals by the EBSERH. The table below shows the first test performed.

Table 4. - Environment discontinuity for the average revenue per patient

Variables	*Coef.*	*IF*
C	-946.72**	380.17
Sys	360.05	243.49
Post	-16.62	33.46
Syspost	-103.91***	39.33
LogEmpreg	533.17***	104.37
LogLeitos	527.36***	134.86

Note. n = 3,761; *p<0.1; **p<0.05; ***p<0.01

The test demonstrates that there is statistical significance at 1% in the interaction coefficient responsible for identifying the environmental discontinuity, that is, it can be interpreted from the results of the statistical test that the variable *average revenue per patient* was negatively affected in the hospitals that contracted with the EBSERH in the analyzed period, which indicates a change in the efficiency of fundraising by hospitals when they became part of the EBSERH health system.

Following, **Table 5** presents the results for the *average length of stay variable* for the same period:

Table 5. - Environmental discontinuity for the average length of stay

Variables	*Coef.*	*IF*
C	7.38***	1.79
Sys	-2.05	1.58
Post	-0.01	0.12
Syspost	-0.06	0.14
LogEmpreg	0.62	0.39
LogLeitos	0.01	0.52

Note. n = 3,760; *p<0.1; **p<0.05; ***p<0.01

As the results demonstrate, there is no statistical significance for the variable of interest (*Syspost*), which implies that the influence of the EBSERH on the hospitals it contracted had no impact on the *average length of stay variable*, and therefore there is no distinction between the contracted hospitals and those not contracted.

Finally, **Table 6** shows the results for the period, considering the *mortality rate variable*.

Table 6. - Environmental discontinuity for mortality rate

Variables	*Coef.*	*IF*
C	10.93***	1.47
Sys	-0.63	0.99
Post	-0.27**	0.12

Syspost	0.24*	0.14
LogEmpreg	-0.87**	0.38
LogLeitos	-1.56***	0.49

Note. n = 3,136; *p<0.1; **p<0.05; ***p<0.01

Although the variable of interest is statistically significant only at 10%, unlike the variable *avarage revenue per patient*, the result points to a higher mortality rate for contracted hospitals when compared with non-contracted hospitals.

What can be inferred from the results of the three variables analyzed together is that in two of them there was a considerable enough impact to make the contracted hospitals (treatment group) stand out from the group of non-contracted hospitals (control group), there being, therefore, support to confirm the hypothesis of environmental discontinuity.

These results are in harmony with those obtained in the studies by Bazzoli *et al.* (2000), Carey (2003), Büchner *et al.* (2015), for example, when finding a noticeable effect on financial performance when a hospital becomes part of a health system (as is the case with EBSERH). The results indicate, therefore, that the hospitals that were contracted by the Company suffered noticeable stress in their organization and management to the point of configuring the discontinuity of the environment.

5. Conclusions

It should be noted that the transition from autonomous management by universities to shared management is a recent phenomenon that has gradually prompted further studies on the subject. Despite extensive discussion regarding the content of the law that created the state-owned company, it should be noted that the literature was still divergent on the expected effects of the suggested changes (Andreazzi, 2013).

The international literature also added to the reservations about the transition from a completely autonomous model to the format in health systems, demonstrating that the impacts on hospital performance were not always as expected and pointing to mixed and inconclusive results. The fact that few studies address the problems of developing countries increased this need (Schreyögg, 2019).

Considering the unique circumstances of the Brazilian experience, with the imposition of challenges due to its predisposition to present low institutional capacity, limited involvement of stakeholders, high level of corruption and high level of informality (Mimba *et al.*, 2007), it was considered pertinent to carry out a thorough investigation on the subject, but not without its challenges.

The national context implied some limitations that are listed and must be considered when extending the results to other studies. Brazil has a small number of teaching hospitals within the scope of the Federal Government, with a total of 51, in which 1 hospital is not yet operational and 10 of them have not contracted with EBSERH. This small number makes it difficult to generalize about the findings, however, with recent changes and the standardization of organizational structures in all hospitals, it was considered relevant to proceed with the analysis.

As for the environmental discontinuity, the tests carried out showed that the variables of *mean value by patient* and *mortality rate* underwent variations that imply that the changes that occurred in the hospitals with the incorporation by the EBSERH were significant. Although the *average length of stay* variable did not present the same result, it was considered that the discontinuity could be verified.

It can be argued that the results demonstrate a deterioration in the services provided by hospitals in the highlighted period. It should be considered, however, that this type of impact is expected due to the environmental discontinuity. What should be noted for future periods is that these changes were supposed to be in the process of stabilization. What will make future studies more difficult is the other major process of organizational crisis caused by the COVID19 pandemic.

Now that this discontinuity has been established, and therefore the objective is satisfied, it is expected that this study, of an exploratory and quantitative nature, will serve as a basis for future research that explores this relationship in the context of the Brazilian public sector.

As specific recommendations, the suggestion is that qualitative studies seek to carry out research on multiple cases to understand, in fact, how the influence of the discontinuity of the environment in hospital operations occurs.

References

Andreazzi, M. de F. S. de. (2013) Empresa Brasileira de Serviços Hospitalares: inconsistências à luz da reforma do Estado. Revista Brasileira de Educação Médica, 37(2), 275-284.

Bahadori, M., Sadeghifar, J., Hamouzadeh, P., Hakimzadeh, S. M., & Nejati, M. (2011). Combining multiple indicators to assess hospital performance in Iran using the Pabon Lasso Model. The Australasian Medical Journal, 4(4), 175-179. doi: 10.4066/AMJ.2011.620

Bazzoli, G. J., Chan, B., Shortell, S. M., & D'Aunno, T. A. (2000). The financial performance of hospitals belonging to health networks and systems. Inquiry, 37, 234-252.

Bittar, O. J. N. V. (2001). Indicadores de qualidade e quantidade em saúde. Revista de Administração em Saúde, 3(12), 21-28.

Borges, J. C. P., Barcelos, M., & Rodrigues, M. S. (2018). Empresarização da saúde pública: o caso da EBSERH. Pensamento Contemporâneo em Administração, 12(4), 75-90. doi: https://doi.org/10.12712/rpca.v12i4.27119

Brizola, J. B., Gil, C. R. R., & Cordoni Júnior, L. (2011). Análise de desempenho de um hospital de ensino antes e após a contratualização com o Sistema Único de Saúde. Revista de Administração em Saúde, 13(50), 7-22.

Büchner, V. A., Hinz, V., & Schreyögg, J. (2015). Cooperation for a competitive position: the impact of hospitals' cooperation behavior on organizational performance. Health Care Management Review, 40(3), 214-224. doi: 10.1097/HMR.0000000000000027

Büchner, V. A., Hinz, V., & Schreyögg, J. (2016). Health systems: changes in hospital efficiency and profitability. Health Care Management Science, 19(2), 130-143. doi: https://doi.org/10.1007/s10729-014-9303-1

Carey, K. (2003). Hospital cost efficiency and system membership. Inquiry, 40, 25-38.

Decreto n.º 7.082, de 27 de janeiro de 2010. Institui o Programa Nacional de Reestruturação dos Hospitais Universitários Federais - REHUF, dispõe sobre o financiamento compartilhado dos hospitais universitários federais entre as áreas da educação e da saúde e disciplina o regime da pactuação global com esses hospitais. http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Decreto/D7082.htm.

Domadenik, P., Prašnikar, J., & Svejnar, J. (2016). Political connectedness, corporate governance, and firm performance. Journal of Business Ethics, 139(2), 411-428. doi: https://doi.org/10.1007/s10551-015-2675-4

Empresa Brasileira de Serviços Hospitalares. (2016). Regimento Interno. Brasília. http://www2.ebserh.gov.br/documents/15796/112576/Regimento+Interno+Aprovado+CA+12052016.pdf/fda5583a-4f34-44ed-b75b-ea96c1332b4b

Empresa Brasileira de Serviços Hospitalares. (2019). Relatório de administração 2018. Brasília. https://www.ebserh.gov.br/sites/default/files/demonstracaofinanceira/201906/Relat%C3%B3rio%20de%20Administra%C3%A7%C3%A3o%20%20Exerc%C3%ADcio%20de%202018%20SEI_23477.001531_2019_37%20%281%29.pdf

Eiff, W. von (2012). Best practice management: in search of hospital excellence. International Journal of Healthcare Management, 5(1), 48-60. doi: https://doi.org/10.1179/175330311X13165972613750

Forbes, D. P., & Milliken, F. J. (1999). Cognition and corporate governance: understanding boards of directors as strategic decision-making groups. Academy of Management Review, 24(3), 489-505. doi: https://doi.org/10.5465/amr.1999.2202133

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. Journal of Econometrics, 225(2), 254-277. doi: https://doi.org/10.1016/j.jeconom.2021.03.014

Gonçalves, A. de. O., Santos, R. L. A. dos, Bilhim, J. A. de F., & Costa, T. D. (2017). Que modelo é esse? As alterações nos processos de capacitação de recursos humanos nos 20 anos do Plano MARE. Administração Pública e Gestão Social, 9(4), 298-309.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: the organization as a reflection of its top managers. Academy of Management Review, 9(2), 193-206. doi: https://doi.org/10.5465/amr.1984.4277628

Haveman, H. A., Russo, M. V., & Meyer, A. D. (2001). Organizational environments in flux: the impact of regulatory punctuations on organizational domains, CEO succession, and performance. Organization Science, 12(3), 253-273. doi: https://doi.org/10.1287/orsc.12.3.253.10104

Hayne, C. (2022). The Effect of Discontinuous and Unpredictable Environmental Change on Management Accounting During Organizational Crisis: A Field Study. Contemporary Accounting Research, 39(3), 1758-1796. doi: https://doi.org/10.1111/1911-3846.12767

Hoppmann, J., Naegele, F., & Girod, B. (2019). Boards as a source of inertia: examining the internal challenges and dynamics of boards of directors in times of environmental discontinuities. Academy of Management Journal, 62(2), https://doi.org/10.5465/amj.2016.1091

Kagzi, M., & Guha, Mahua. (2018). Board demographic diversity: a review of literature. Journal of Strategy and Management, 11(1), 33-51. doi: https://doi.org/10.1108/JSMA-01-2017-0002

Koumpouros, Y. (2013). Balanced scorecard: Application in the General Panarcadian Hospital of Tripolis, Greece. International Journal of Health Care Quality Assurance, 26(4), 286-307. doi: https://doi.org/10.1108/09526861311319546

Li, C., & Patel, P. C. (2019). Jack of all, master of all? CEO generalist experience and firm performance. The Leadership Quarterly, 30(3), 320-334. https://doi.org/10.1016/j.leaqua.2018.08.006silvera

Liebl, F., & Schwarz, J. O. (2010). Normality of the future: trend diagnosis for strategic foresight. Futures, 42, 313-327. doi: https://doi.org/10.1016/j.futures.2009.11.017

Mimba, N. P. S. H., van Helden, G. J., & Tillema, S. (2007). Public sector performance measurement in developing countries: a literature review and research agenda. Journal of Accounting and Organizational Change, 3(3), 192-208. doi: https://doi.org/10.1108/18325910710820265

United Nations. (2019). World economic situation and prospects. Recovered from https://www.un.org/development/desa/dpad/document_gem/global-economic-monitoring-unit/world-economic-situation-and-prospects-wesp-report/

Nguyen, T. M., Malik, A., Budhwar, P. (2022). Knowledge hiding in organizational crisis: The moderating role of leadership. Journal of Business Research, 139, 161-172. doi: https://doi.org/10.1016/j.jbusres.2021.09.026

Oliveira, G. A. (2014). A compatibilidade de princípios e modelo de Estado que subjazem ao SUS e à EBSERH (Empresa Brasileira de Serviços Hospitalares). (Dissertação de Mestrado). Universidade Católica, Porto Alegre, RS, Brasil. Recuperado de http://tede2.pucrs.br/tede2/handle/tede/4725

Paula, A. P. P. de. (2005). Por uma nova gestão pública. Rio de Janeiro: FGV.

Rahimi, H., Kavosi, Z., Shojaei, P., & Kharazmi, E. (2017). Key performance indicators in hospital based on balanced scorecard model. Journal of Health Management & Informatics, 4(1), 17-24.

Ramamonjiarivelo, Z., Weech-Maldonado, R., Hearld, L., Menachemi, N., Epané, J. P., & O'Connor, S. (2015). Public hospitals in financial distress: is privatization a strategic choice? Health Care Management Review, 40, 337-347. doi: 10.1097/HMR.0000000000000032

Ramamonjiarivelo, Z., Weech-Maldonado, R., Hearld, L., Pradhan, R., & Davlyatov, G. (2020). The privatization of public hospitals: its impact on financial performance. Medical Care Research and Review, 77(3), 249-260. doi: 10.1177/1077558718781606

Sano, H., & Abrucio, F. L. (2008). Promessas e resultados da Nova Gestão Pública no Brasil: o caso das Organizações Sociais de Saúde em São Paulo. Revista de Administração de Empresas, 48, 64-80. doi: https://doi.org/10.1590/S0034-75902008000300007

Schaedler, L., Graf-Vlachy, L., & König, A., (2022). Strategic leadership in organizational crises: A review and research agenda. Long Range Planning, 55, 1-28. doi: https://doi.org/10.1016/j.lrp.2021.102156

Schreyögg, J. (2019). Changes in hospital financing and organization and their impact on hospital performance. doi: 10.1093/acrefore/9780190625979.013.380

Shukri, N. F. M., & Ramli, A. (2015). Organizational structure and performance of responsible Malaysian healthcare providers: a balanced scorecard perspective. Procedia Economics and Finance, 28, 202-212. doi: https://doi.org/10.1016/S2212-5671(15)01101-6

Thorpe, K., Florence, C., & Sieber, E. (2000). Hospital conversions, margins, and the provision of uncompensated care. Health Affairs, 19(6), 187-194. doi: https://doi.org/10.1377/hlthaff.19.6.187

Trotta, A., Cardamone, E., Cavallaro, G., & Mauro, M. (2013). Applying the Balanced Scorecard approach in teaching hospitals: a literature review and conceptual framework. The International Journal of Health Planning and Management, 28. doi: 181-201. 10.1002/hpm.2132

Villa, S., & Kane, N. (2013). Assessing the impact of privatizing public hospitals in three American states: Implications for universal health coverage. Value in Health. doi: 16(1), S24-33. 10.1016/j.jval.2012.10.003

World Bank. (2010). Fixing the public hospital system in China. Washington, DC. http://documentos.bancomundial.org/curated/es/947791468242107797/pdf/584110NWP0V20P10No21Hospital0Reform.pdf

GCG
The Journal *of* Globalization, Competitiveness, and Governability

Influência do Desvio e da Turbulência Orçamentária no Resultado Primário de Governos Locais

ÁREA: 4
TIPO: Aplicação

AUTORES

Cleonice Witt[1]
Universidade do Contestado (UnC), Brasil
Cleonicewitt7@gmail.com

Ilse Maria Beuren
Universidade Federal de Santa Catarina (UFSC), Brasil
Ilse.beuren@gmail.com

Nelson Hein
Universidade Regional de Blumenau (FURB), Brasil
hein@furb.br

1. Autor de contato: Avenida Presidente Nereu Ramos nº 1071, Jardim do Moinho CEP: 89306-076 Mafra – SC, Brasil

Influencia de la desviación y turbulencia presupuestaria en el resultado primario de los gobiernos locales
Influence of deviation and budgetary turbulence in the primary outcome of local governments

Este estudo analisa a influência do desvio e da turbulência orçamentária no resultado primário de governos locais. Os dados de 230 municípios brasileiros foram analisados com aplicação de modelos lineares hierárquicos. A turbulência orçamentária parece influenciar positivamente o resultado primário dos municípios de porte pequeno, médio e grande porte. O desvio orçamentário parece influenciar negativamente o resultado primário dos municípios de pequeno porte e positivamente os de médio e grande porte. Quando da ocorrência concomitante da turbulência e do desvio orçamentário, o resultado primário de pequenos, médios e grandes municípios é influenciado negativamente.

Este estudio analiza la influencia de la desviación y de la turbulencia presupuestaria en el resultado primario de gobiernos locales. Los datos de 230 municipios brasileños se analizaron utilizando modelos lineales jerárquicos. Turbulencia presupuestaria parece influir negativamente en el resultado primario de los pequeños municipios y positivamente en los de mediano y gran tamaño. Desviación presupuestaria parece influir negativamente en los municipios de mediano tamaño y positivamente en los de pequeño y gran tamaño. Cuando ocurren las turbulencias y desviaciones presupuestarias, el resultado primario de pequeños y medianos municipios se ve influenciado negativamente y el de los grandes municipios positivamente.

This study analyzes the influence of deviation and budgetary turbulence on the primary outcome of local governments. Data from 230 Brazilian municipalities were analyzed using linear hierarchical models. Budgetary turbulence seems negatively influences the primary outcome of small municipalities and positively those of medium and large size. Budgetary deviation seems to negatively influence the medium-sized municipalities and positively small and large ones. When the turbulence and the budgetary deviation occur concomitantly, the primary result of small and medium municipalities is negatively influenced and that of large municipalities positively.

DOI **10.58416/GCG.2024.V18.N1.02**
Recebido **03.01.2023**
Aceitado **10.06.2023**

GCG
The Journal *of* Globalization, Competitiveness, and Governability

1. Introdução

Palavras-chave
Turbulência orçamentária. Desvio orçamentário. Resultado primário.

Palabras clave
Turbulencia presupuestaria. Desviación presupuestaria. Resultado primario.

Keywords
Budgetary turbulence. Budgetary deviation. Primary Outcome.

O orçamento representa o fundamento do planejamento, controle e prestação de contas no setor público (Johansson & Siverbo, 2014). O orçamento baliza as ações governamentais e possui duas finalidades principais: controlar o poder político por meio de balizas jurídicas e promover a transparência dos atos governamentais (Afonso, 2016). Entre as balizas jurídicas se destaca a Lei Orçamentária, que constitui autorização do poder legislativo ao poder executivo executar o orçamento aprovado (Afonso, 2016). Essa lei estima receitas e fixa despesas para atender demandas sociais e manter a estrutura administrativa.

Após a aprovação dessa lei, o órgão público inicia em janeiro do ano seguinte a execução do orçamento e o conclui em dezembro do mesmo ano. Nesse período podem ocorrer desvios orçamentários, seja devido à diferenças entre planos e resultados como erro de previsão ou pela não implementação dos planos, o que resulta em despesa empenhada maior (menor) do que a dotação inicial (Piza, 2019). No erro de previsão, o valor fixado para a despesa foi insuficiente, enquanto que no erro de execução (não implementação do plano) o valor fixado é superior ao realizado (Piza, 2019).

Esses desvios orçamentários ocorrem geralmente em um ambiente de turbulência orçamentária, particularmente no ambiente que fornece recursos para o ente (Boyne & Meier, 2009; Johansson & Siverbo, 2014). A turbulência orçamentária constitui alterações nos recursos previstos no orçamento aprovado no ano anterior para o ano seguinte (Boyne & Meier, 2009). Essas alterações merecem atenção, mesmo quando representam uma alocação mais eficiente dos recursos no orçamento (Bogoni, Hein & Beuren, 2011).

Johansson e Siverbo (2014) realizaram uma pesquisa sobre a adequação do controle orçamentário rígido em entes do setor público que enfrentam turbulência orçamentária. Descobriram que nessas situações devem utilizar um controle rígido do orçamento para aumentar a probabilidade de cumprimento das metas orçamentárias. Isso sugere uma lacuna de pesquisa no ambiente brasileiro, em que o orçamento resulta de negociações e priorizações políticas (Johansson & Siverbo, 2014) e, consequentemente, os municípios tendem a ter turbulência ambiental na fixação e execução do orçamento.

Nesta perspectiva, o objetivo deste estudo é analisar a influência do desvio e da turbulência orçamentária no resultado primário de governos locais. Este estudo é relevante por ampliar as evidências empíricas nesse campo, visto que a maioria das pesquisas com esse enfoque é de natureza teórica (Hartley, Alford, Knies & Scott, 2017). Assim, buscam-se avanços ao demonstrar que a turbulência e/ou o desvio orçamentário afetam o resultado primário, com foco na geração de valor para a sociedade consoante a Teoria do Valor Público.

Hartley *et al.* (2017) advertem que a teoria do valor público pode desaparecer se não forem realizadas pesquisas empíricas para testar, desafiar e estender as contribuições acadêmicas. Desse modo, esta pesquisa contribui para o avanço teórico ao atender a essa chamada na

Códigos JEL
M48; O23; P35

literatura. Contribui também ao aguçar o interesse de pesquisadores para o tema. Contribui ainda para ampliar a visão de governantes e da sociedade, de que devem ser eliminados os gastos que não contribuem para a geração de valor público, ou seja, que não geram resultado para a sociedade em termos econômicos, sociais, políticos e ecológicos.

Este estudo inova em relação ao de Johansson e Siverbo (2014) ao investigar, não o controle orçamentário rígido, mas o desvio e a turbulência orçamentária com base na Teoria do Valor Público e seu efeito no resultado primário do ente público. Entre as abordagens da Teoria do Valor Público enfatiza-se a do valor público voltado ao bem-estar da sociedade, promovido por meio de atividades prestadas pelo poder público (Hartley *et al.*, 2017).

O resultado primário é um indicador de geração de valor público (Fiirst & Beuren, 2021), pois indica se os gastos orçamentários são compatíveis com as receitas oriundas da arrecadação para executar as atividades que promovem o bem-estar da sociedade (Sell, Beuren & Lavarda, 2020). O desvio e/ou a turbulência orçamentária impactam o resultado orçamentário, logo, impactam positiva ou negativamente a geração de valor público. Contudo, os efeitos do controle orçamentário na administração pública precisam ser mais bem compreendidos, consoante Beuren e Zonatto (2014) tanto nos diferentes níveis de governo (federal, estadual ou municipal), como esferas do poder (executivo, legislativo e judiciário),

2. Base Teórica e Hipóteses

A Teoria do Valor Público foi proposta por Moore (1995) na educação executiva, sendo alguns de seus seguidores Alford e O'flynn (2009), Benington e Moore (2011), Bryson, Crosby e Bloomberg (2014) e Hartley (2011). Alford e O'flynn (2009) rastrearam novos significados de valor público. Benington e Moore (2011) defendem que o valor público é uma alternativa à teoria da escolha pública. Bryson *et al.* (2014) dedicaram um capítulo de seu livro para tratar da criação de valor público. Hartley (2011) examinou circunstâncias em que a inovação e melhoria dos serviços podem agregar valor público.

Chohan e Jacobs (2016) investigaram empiricamente a política à luz do valor público, com foco no orçamento legislativo. Bryson *et al.* (2017) sugeriram mudanças na teoria do valor público, particularmente na estrutura do triângulo estratégico, diante de um mundo emergente em que os formuladores de políticas e os gestores precisam criar valor público. Geuijen, Moore, Cederquist, Ronning e Twist (2017) investigaram como o valor público pode orientar a análise e a ação da migração forçada, utilizando o triângulo estratégico.

Hartley *et al.* (2017) forneceram uma estrutura baseadas em três conceituações de valor público: noção do valor público como uma contribuição para a esfera pública; noção de valor público como adição de valor em um ambiente organizacional ou de parceria; e estrutura heurística do triângulo estratégico. Bajpai (2017) investigou o valor público como uma estrutura normativa, e o alcance e aprimoramento à luz do valor público, do bem público e do aspecto democrático.

A noção de valor público como adição de valor por meio de ações em um ambiente organizacional ou de parceria, proposta por Hartley *et al.* (2017), permeia o estudo. A ótica de valor público no sentido de o ente público estar ou não gerando valor público para a sociedade está implicada no orçamento, pois para oferecer serviços públicos que promovam o bem-estar social são necessários recursos, oriundos do orçamento público. A mobilização desses recursos é inerente à capacidade operacional da administração pública, capaz de produzir o valor público desejado (Bajpai, 2017).

2.1. Turbulência orçamentária e resultado primário

A turbulência decorre do dinamismo do ambiente das organizações públicas (Denford, Dawson, Desouza & Manoharan, 2022). A turbulência representa a imprevisibilidade de mudança, a vicissitude na munificência e a complexidade do ambiente (Boyne & Meier, 2009). A munificência concerne ao potencial de crescimento e desenvolvimento da organização, o que demanda recursos econômicos, enquanto a complexidade concerne à homogeneidade (heterogeneidade) das circunstâncias externas (Boyne & Meier, 2009).

A turbulência orçamentária pode ser endógena (exógena) em decorrência de: ambiente turbulento, organizações turbulentas e turbulência de escala (Ansell & Trondal, 2018). O ambiente turbulento exógeno pode causar turbulência orçamentária devido à decisões legais, rápidas mudanças tecnológicas, conflitos partidários, entre outros. Organizações turbulentas podem causar turbulência endógena devido à rotatividade de pessoal, regras conflitantes, reforma interna, entre outras. A turbulência de escala revela-se quando as decisões endógenas de um nível de autoridade ou escala de atividade afetam outro nível, causando turbulência.

A munificência do ambiente caracteriza a turbulência orçamentária (Boyne & Meier, 2009). Nessa perspectiva, a turbulência orçamentária pode provocar mudanças substanciais no orçamento de um ano para outro (Johansson & Siverbo, 2014), gerando incerteza quanto aos recursos que estarão disponíveis e os gastos necessários para prover os serviços públicos voltados ao bem-estar da população. Dado que o orçamento representa os recursos disponíveis para a execução de políticas públicas, mudanças nesse ambiente geram um efeito agregado no orçamento quanto à disponibilidade de recursos (Johansson & Siverbo, 2014).

No entanto, a conversão em valor monetário dos insumos e resultados é difícil de ser percebida empiricamente (Seal & Ball, 2011). A materialização do relacionamento desses elementos é expressa pelo resultado primário, obtido pela diferença entre receitas e despesas primárias (Paganotto, Oliveira & Antunes, 2017). Esse controle do endividamento permite avaliar a capacidade do ente de pagar os seus compromissos, demonstra o esforço fiscal atual do setor público sem considerar déficits anteriores (Feld, Köhler & Wolfinger, 2020).

As receitas e despesas primárias são apuradas pelo regime de caixa (Gerigk & Clemente, 2012). As receitas primárias provêm da atividade fiscal do ente, englobam receitas tributárias, contribuições, patrimonial, agropecuária, industrial, de serviços, além de transferências recebidas de outros entes da federação ou da União. As despesas primárias representam os gastos indispensáveis para proporcionar os serviços públicos à sociedade, como despesas de custeio e transferências realizadas para outros entes.

A turbulência orçamentária abala o resultado primário, visto que alterações na ambiência que guarnece recursos para o ente impactam na arrecadação dos recursos, uma vez que essas mudanças podem aumentar ou diminuir as receitas primárias. O efeito agregado que a turbulência orçamentária causa nos recursos disponíveis no ente público é refletido no orçamento (Johansson & Siverbo, 2014). Diante do exposto, postula-se que:

H1: A turbulência orçamentária influencia negativamente o resultado primário de governos locais.

2.2. Desvio orçamentário e resultado primário

O orçamento público possui importância especial no atendimento de demandas em escala (Benito, Guillamón & Bastida, 2015), que reflete as decisões políticas e prioridades (Johansson & Siverbo, 2014). O orçamento é um mecanismo de gestão que projeta recursos e gastos para as atividades futuras e investimentos destinados ao bem-estar da sociedade, cuja credibilidade depende de sua estabilidade (Aquino & Azevedo, 2017).

Fatores econômicos, políticos e institucionais, pessoas envolvidas no processo e ocorrência de eventos não previstos (Bagdigen, 2005; Denford *et al.*, 2022) podem afetar a exatidão orçamentária. A eficácia da despesa orçamentária é determinada pela razão entre a despesa executada (despesa empenhada) e a despesa fixada (dotação atualizada da despesa) (Revorêdo, Silva, Silva & Libonati, 2021).

Desvios orçamentários são materializados no contexto brasileiro via abertura de créditos adicionais (Aquino & Azevedo, 2017). De acordo com o art. 40, da Lei n° 4.320, de 17 de março de 1964, os créditos adicionais são "as autorizações de despesa não computadas ou insuficientemente dotadas na Lei de Orçamento". Esse amparo legal para a criação de desvios orçamentários, desde que haja recursos previamente disponíveis, permite presumir que seja uma prática institucionalizada nos municípios brasileiros (Cruz & Afonso, 2018).

As variações promovidas no orçamento durante a sua execução representam desvios orçamentários que advêm de intercorrências difíceis de prever e/ou de manipulação política com amparo legal (Cruz & Afonso, 2018). Entretanto, a legislação que baliza esses desvios no orçamento pode ser utilizada para manipular escolhas orçamentárias (Revorêdo *et al.*, 2021). É possível que políticos optem por orçamentos ambíguos na falta de estímulo para práticas transparentes no processo orçamentário (Gomes & Silva, 2022). Todavia, o controle social pode elevar a transparência dos governos (Beuren & Almeida-Santos, 2013).

Desvios orçamentários podem ser determinantes para situações de desequilíbrio financeiro conjuntural e estrutural (Martins & Correia, 2015). Tão ou mais perniciosos são os atos que promovem alterações sistemáticas no orçamento (Benito *et al.*, 2015). Nessa perspectiva, o resultado primário, que decorre do confronto entre as receitas e despesas primárias (Paganotto *et al.*, 2017), pode ser impactado pelo desvio orçamentário, visto que esse pode alterar substancialmente os valores que foram planejados e que deveriam conduzir as ações ao longo do exercício financeiro. Nesse sentido, presume-se que:

H2: O desvio orçamentário influencia negativamente o resultado primário de governos locais.

2.3. Turbulência orçamentária, desvio orçamentário e resultado primário

A turbulência orçamentária geralmente é proveniente de instabilidade externa, demandas sociais conflitantes, ruídos no processo democrático e político, inflexibilidade não trivial de insumos (Ansell & Trondal, 2018), aliada a atrasos na seleção de prioridades fundamentadas em bases não econômicas, o que pode levar a uma adaptação desajustada do orçamento (Johansson & Siverbo, 2014). A turbulência orçamentária pode causar variações substanciais no orçamento de um ano para o outro (Boyne & Meier, 2009).

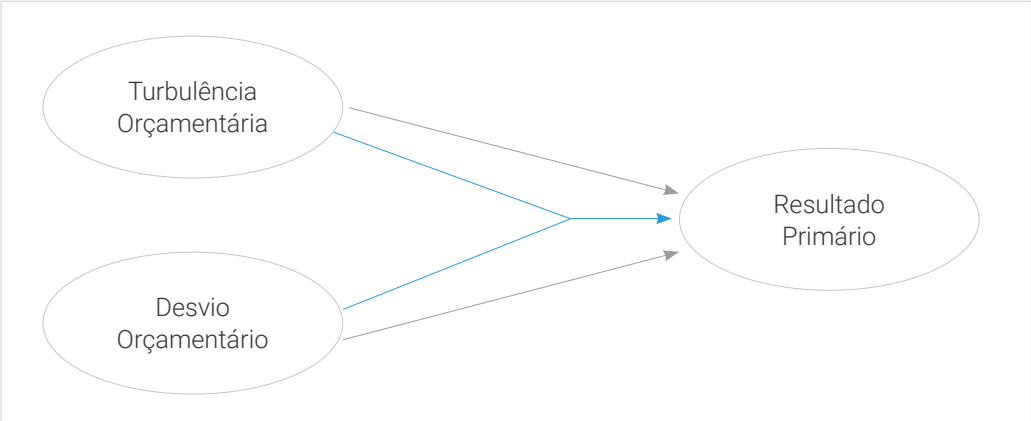
O desvio orçamentário, por sua vez, representa um descaminho na rota financeira do ente público, nem sempre provocado por casos fortuitos e de força maior. Pode ter como origem o interesse particular do político, uma vez que baixa arrecadação e redução nos gastos são onerosos politicamente (Martins & Correia, 2015). Apoio político pode aumentar as previsões orçamentárias quando as alterações são flexíveis, quando não há um controle social efetivo e ausência de oposição política (Beuren & Almeida-Santos, 2013).

A turbulência orçamentária e o desvio do orçamento, quando combinados, podem comprometer a execução do orçamento (Johansson & Siverbo, 2014), que tem como foco principal o bem-estar da sociedade. Com base nesses argumentos conjectura-se que:

> *H3: A turbulência orçamentária e o desvio orçamentário influenciam negativamente o resultado primário de governos locais.*

Na **Figura 1** apresenta-se o modelo teórico da pesquisa.

Figura 1 - Modelo conceitual



Postula-se que a turbulência orçamentária influencia negativamente o resultado primário (H_1), assim como o desvio orçamentário (H_2), e que a turbulência e o desvio orçamentário juntos influenciam negativamente o resultado primário (H_3).

A turbulência ambiental presume-se que diminua o resultado primário de governos locais, visto que nesse cenário a atividade econômica das empresas é afetada. Com as atividades reduzidas, o recolhimento

de tributos diminui, o que afeta a arrecadação do ente público. Se essa situação é acompanhada de inflação, o valor dos gastos aumenta com o aumento do preço dos insumos.

O desvio orçamentário pressupõe-se que cause redução no resultado primário de governos locais, uma vez que o montante da dotação inicial dos gastos é subestimado ou gerenciado para que o orçamento fique equilibrado. Nessa conjuntura, o orçamento inicial aprovado não representa a necessidade de gastos e/ou o interesse político nesses gastos.

A ocorrência de turbulência e desvio orçamentário no mesmo período conjectura-se que afetem negativamente o resultado primário de governos locais, porque num cenário de economia em retração ocorre redução no recolhimento dos tributos e os gastos aumentam devido à elevação dos preços dos insumos e dos salários. Essa circunstância, aliada ao desvio orçamentário, altera o valor das despesas fixadas no orçamento inicial no decorrer do período, o que influencia negativamente o resultado primário.

3. Método

3.1. Dados da pesquisa

A população do estudo é composta por 5.568 municípios, sendo representada pela amostra de 230 municípios, o que equivale a aproximadamente 4,5%, utilizando nível de confiança de 90% com 5% de erro. O tipo de amostragem utilizado foi a aleatória simples e a escolha foi feita através de sorteio. Para o sorteio os municípios foram separados em grupos: 1 municípios até 25.000 habitantes, 2 de 25.000 a 100.000 habitantes e 3 acima de 100.000 habitantes. O sorteio foi realizado por grupo utilizando o sorteador online, disponível em https://sorteador.com.br/, sendo que para operacionalizar o sorteio foi atribuído um número para cada município e após cada sorteio foi consultado qual município possuía esse número e assim sucessivamente. A **tabela 1** apresenta a caracterização dos grupos da amostra.

Tabela 1 - Caracterização da amostra

Grupo	*Porte*	*Municípios*	*Amostra*
Baixo	Pequeno	4.282	171
Médio	Médio	1.003	40
Alto	Grande	283	19
Total		5.568	230

Dados de 230 municípios dos 26 estados da federação brasileira foram coletados, sendo que cada estado não possui o mesmo número de representantes na amostra. A seleção de municípios de todos os estados justifica-se pelas diferenças culturais, econômicas e sociais no território brasileiro. Assim, realidades distintas são incorporadas na pesquisa, o que com parcimônia pode refletir a realidade

brasileira como um todo. Os dados foram obtidos no *site* do Tesouro Nacional por meio do Sistema de Informações Contábeis e Fiscais do Setor Público Brasileiro (SICONFI).

3.2. Variáveis

As variáveis e equações foram propostas em consonância com o propósito da pesquisa, demonstradas na **Tabela 2**.

Tabela 2 - Variáveis e equações

Variáveis	*Equações*	*Autores*
Variável dependente		
Resultado primário	$receitas\ correntes - despesas\ correntes$	Elaboração própria
Variáveis independentes		
Turbulência orçamentária	$\frac{despesas\ correntes\ empenhadas\ ano\ anterior - receitas\ correntes\ previstas\ ano\ atual}{despesas\ correntes\ empenhadas\ no\ anto\ antrior}$	(Johansson & Siverbo, 2014)
Desvio orçamentário	$\frac{dotação\ inicial\ das\ despesas\ correntes\ ano\ atual}{total\ das\ despesas\ correntes\ empenhadas\ ano\ atual}$	

A turbulência orçamentária é expressa em um índice, sendo negativo quando o orçamento está crescendo e positivo quando está retraindo, porém, em ambas as situações demonstra a ocorrência de turbulência orçamentária. O desvio orçamentário é representado por um índice que pode ser maior ou menor que 1, quando maior indica gastos abaixo dos valores orçados e quando menor indica que os gastos foram superiores aos valores orçados. Em ambas situações há desvio orçamentário. A variável dependente, resultado primário, é expressa em valores absolutos, em que saldo negativo representa déficit primário e saldo positivo superávit primário.

3.3. Procedimentos de análise dos dados

Os municípios selecionados foram divididos em três grupos: grupo baixo [1], grupo médio [2] e grupo alto [3]. Esta classificação foi baseada na população, sendo que, até 25 mil habitantes foram considerados como pequeno porte, de 25 a 100 mil habitantes de médio porte e acima de 100 mil habitantes de grande porte (Calvo, Lacerda, Colussi, Schneider & Rocha, 2016).

Após a categorização dos municípios e definidas as variáveis, dependente Resultado Primário (RP), independentes Turbulência Orçamentária (TO) e Desvio Orçamentário (DO), moderadora (TO x DO), que foi representada por TODO, fez-se a compactação pelo produto do desvio de suas médias (Marôco, 2014). Estes valores foram submetidos à análise dos modelos lineares hierárquicos em relação à variável dependente (RP).

Depois da compactação dos dados, organizaram-se os mesmos de forma hierárquica nos modelos lineares hierárquicos (MLH), que se propõem a tratar estatisticamente a variação originada pelas

diferenças individuais e contextuais. Os modelos contextuais contêm dois tipos de variáveis, uma individual (porte do município) e outra contextual.

A estimativa de um modelo multinível, com a utilização do SPSS®, permite identificar características que explicam possíveis diferenças de desempenho entre municípios no mesmo nível, bem como se existem características ambientais, sociais ou de governança que explicam possíveis diferenças no desempenho dos municípios de diferentes níveis. A noção central dos MLH se fundamenta em modelos lineares diferentes para o micro nível, que devem se ajustar para cada contexto, o macro nível (Fávero & Belfiore, 2019).

O modelo linear hierárquico considera estruturas aninhadas, agrupando modelos de regressão por grupos (Fávero & Belfiore, 2019). Com isso é possível estabelecer um modelo de regressão para cada grupo dentro de um nível de agrupamento. O modelo geral é dado por $\gamma_i = \beta_0 + \beta_1\chi_i + \varepsilon_i$; onde i é o nível do indivíduo. O modelo hierárquico de dois níveis é dado por $\gamma_{ij} = \beta_{0j} + \beta_{1j}\chi_{ij} + \varepsilon_{ij}$.

Os coeficientes β_{0j} e β_{1j} são próprios de cada contexto. Supõe-se variabilidade entre os contextos, representados pelas equações: $\beta_{0j} = \beta_0 + \mu_{0j}$ e $\beta_{1j} = \beta_1 + \mu_{1j}$. O coeficiente β_{0j} é decomposto em β_0, que é o rendimento médio da população e representa a parte sistemática da equação, em que μ_{0j} é o efeito diferencial do sistema j e representa a parte aleatória do modelo de segundo nível vinculada ao ponto de corte. Similarmente, β_1 pode possuir variabilidade própria, decompondo-se em β_1 que é o incremento médio do rendimento do desempenho e μ_{1j} é o incremento diferencial do contexto j (Fávero & Belfiore, 2019).

Para estimar os parâmetros foi utilizada a máxima verossimilhança com valores centralizados, não pelo grupo específico, mas pela média de todos os elementos, dado que os níveis são independentes entre si (Marôco, 2014). Os algoritmos de estimação, por meio de iterações sucessivas, permitem determinar o valor dos coeficientes para análise dos resultados (Fávero & Belfiore, 2019). Os modelos são assim descritos:

Hipótese H_1:

$$RP_i = \gamma_{00} + \gamma_{10}TO_i + u_{1j}TO_{ij} + \beta_1 TAM_{ij} + \beta_2 TO \times TAM_{ij} + u_{0j} + \varepsilon_{ij} \quad \text{Eq.1}$$

Hipótese H_2:

$$RP_i = \gamma_{00} + \gamma_{10}DO_i + u_{1j}DO_{ij} + \beta_1 TAM_{ij} + \beta_2 DO \times TAM_{ij} + u_{0j} + \varepsilon_{ij} \quad \text{Eq.2}$$

Hipótese H_3:

$$RP_i = \gamma_{00} + \gamma_{10}TODO_i + u_{1j}TODO_{ij} + \beta_1 TAM_{ij} + \beta_3 TODO \times TAM_{ij} + u_{0j} + \varepsilon_{ij} \quad \text{Eq.3}$$

4. Análise dos Resultados

4.1. Resultado primário dos municípios

Os resultados da regressão linear hierárquica são apresentados na **Tabela 3**.

Tabela 3 - Resultados da regressão linear hierárquica

Parâmetros	*Tamanho dos Municípios*		
	Nível-1	*Nível-2*	*Nível-3*
Constante	9222,19	-20677,49	-85734,96
DO	-3567,23**	30967,13**	173629,86***
TO	-6095,24***	-2054,03**	-56317,45**

Significância ao nível de *p<0,1; **p<0,05; ***p<0,01. R^2=16,75%. Os valores originais de RP foram divididos por mil (1000), sem prejuízo em sua interpretação.
Nota: Variável Dependente: Resultado Primário (RP); Variáveis Independentes: Desvio Orçamentário (DO) e Turbulência Orçamentária (TO).

Os resultados apontam para três equações distintas, cada qual em seu nível hierárquico:

$$RP_{Pequenos} = 9222{,}19 - 3567{,}23DO_{pequenos} - 6095{,}24TO_{pequenos} + \varepsilon$$

$$RP_{médios} = -20677{,}49 + 30967{,}13DO_{médios} - 2054{,}03TO_{médios} + \varepsilon$$

$$RP_{grandes} = -85734{,}96 + 173629{,}86DO_{grandes} - 56317{,}45TO_{grandes} + \varepsilon$$

Os municípios de médio e grande porte apresentaram resultado primário (RP) negativo, enquanto os de pequeno porte resultado positivo. Este comportamento denominado de U-invertido indica que o máximo desempenho é obtido em nível baixo (Pekovic, Grolleau & Mzoughi, 2018).

Fatores explicativos desse comportamento nos municípios médios podem ser gastos elevados principalmente com folha de pagamento, que normalmente é a maior parcela das despesas correntes, arrecadação insuficiente para fazer frente aos gastos, redução das transferências recebidas dos Estados e/ou da União.

Nos municípios grandes, considerando para a classificação o critério populacional, fatores explicativos para o resultado primário negativo podem ser uma maior demanda por serviços públicos, principalmente de saúde e educação. Podem ainda ter um nível incipiente de responsabilidade fiscal, o que provoca baixos níveis econômicos e de autonomia financeira (Cruz & Afonso, 2018).

Nos municípios de pequeno porte, possíveis indicativos do resultado primário positivo são: desconcentração industrial, que levou indústrias a se estabelecerem em municípios desse porte; e mobilidade da fronteira agrícola, estimulada pela modernização da agricultura. Esses fatores contribuem para o aumento da arrecadação e investimentos em infraestrutura (Stamm, Staduto, Lima & Wadi, 2013), que impulsionam a economia local. Outro fator explicativo pode ser a boa administração dos gastos com pessoal e do endividamento, considerado o espaço de manobra da gestão financeira municipal (Gerigk & Clemente, 2012).

4.2. Desvios orçamentários e turbulência orçamentária nos municípios

Os desvios orçamentários aparentemente são iguais, mesmo que tecnicamente possam ser interpretados de diversas formas e com consequências incertas. Um desvio de 0,75 (gastos superiores ao orçado) é similar a um desvio de 1,25 (gastos inferiores ao orçado). A turbulência orçamentária, seja ela positiva (orçamento em diminuição) ou negativa (orçamento em expansão), pode ser tecnicamente entendida como turbulência. Assim, refazendo a análise chega-se aos resultados da **Tabela 4**.

Tabela 4 - Resultados da regressão linear hierárquica

Parâmetros	*Porte dos Municípios*		
	Nível-1	*Nível-2*	*Nível-3*
Constante	7877,64	-26357,68	-104065,06
DO	-2382,14**	34093,97**	211758,06***
TO	2041,58***	11083,56**	-73462,81**

Significância ao nível de *p<0,1; **p<0,05; ***p<0,01. R^2=15,56%. Os valores originais de RP foram divididos por mil (1000), sem prejuízo em sua interpretação.
Nota: Variável Dependente: Resultado Primário (RP); Variáveis Independentes: Desvio Orçamentário (DO) e Turbulência Orçamentária (TO).

As equações em sua nova interpretação são dadas sob as formas que seguem:

$$RP_{Pequenos} = 7877{,}64 - 2382{,}14DO_{pequenos} + 2041{,}58TO_{pequenos} + \varepsilon$$

$$RP_{médios} = -26357{,}68 + 34093{,}97DO_{médios} + 11083{,}56TO_{médios} + \varepsilon$$

$$RP_{grandes} = -104065{,}06 + 211758{,}06DO_{grandes} - 73462{,}81TO_{grandes} + \varepsilon$$

O desvio orçamentário (DO), seja em gastos superiores ao orçamento ou abaixo dele, em municípios de pequeno porte mostrou-se prejudicial ao seu resultado primário (RP), enquanto nos municípios de médio e grande porte sua influência apresentou melhora no resultado. Portanto, a H_2 foi confirmada apenas para os municípios de pequeno porte, visto que para os de médio e grande a influência foi positiva.

Nos municípios de pequeno porte, em que o desvio orçamentário influencia negativamente o resultado primário, uma provável causa para esse cenário é a utilização do superávit financeiro, obtido no exercício anterior, como fundamento para a abertura de despesas primárias que não integrem o grupo de despesas de pessoal. Azevedo e Aquino (2016) constataram que em municípios pequenos geralmente o orçamento é elaborado pelo contador como uma rotina operacional, e os vereadores fazem na sessão de aprovação do orçamento a leitura das receitas e despesas, sem nenhuma discussão.

Nos municípios médios e grandes, em que o desvio orçamentário influencia positivamente o resultado primário, uma possível explicação pode ser um planejamento falho nesses municípios, ou seja, desvios na execução orçamentária são constantes e reiterados e, por isso, se adaptam facilmente, não impactando negativamente no resultado primário.

Nesses municípios, em que os desvios orçamentários acarretaram em melhoria no resultado primário, a receita prevista pode ter sido subavaliada, fazendo com que os desvios dos gastos não impactassem no resultado orçamentário. Cruz e Afonso (2018) observaram que nos grandes municípios brasileiros são parcos os casos de operações de crédito, de concessão de garantias e de antecipação de receitas orçamentárias, pois conseguem obter receitas totais suficientes para fazer frente aos gastos. Como a primeira análise revelou déficit primário, pode-se inferir que a folga orçamentária em relação às receitas é proveniente das receitas de capital, que não integram o resultado primário.

A turbulência orçamentária mostrou-se prejudicial nos municípios grandes, enquanto nos de pequeno e grande porte houve ganhos no resultado primário. Isso porque os grandes municípios tendem a serem mais afetados quando há aumento da demanda principalmente nos setores da saúde e educação, fazendo com que as despesas fiquem altas em relação às receitas previstas para o exercício corrente. Assim, as receitas correntes previstas para o ano em curso são menores do que os gastos passados, indicando que o aumento nas receitas correntes do exercício atual seja menor do que o aumento das despesas realizadas no exercício anterior. Em um cenário de retração econômica, esses municípios são significativamente afetados. Assim, confirma-se a H_1 apenas para os municípios grandes, visto que para os de pequeno e médio porte há influência positiva.

Como análise complementar desenvolveu-se um modelo moderado entre desvio orçamentário (DO) e turbulência orçamentária (TO). A inclusão da variável DOTO na análise hierárquica levou aos resultados da Tabela 5.

Tabela 5 - Resultados da regressão linear hierárquic

Parâmetros	*Tamanho dos Municípios*		
	Nível-1	*Nível-2*	*Nível-3*
Constante	7514,38	-26936,22	-123331,94
DO	-2119,37**	34780,48**	230929,78*
TO	3196,58*	12629,41**	9555,63**
DO×TO	-696,12***	-1965,13**	-81144,97**

Significância ao nível de *p<0,1; **p<0,05; ***p<0,01. R^2=17,41%. Os valores originais de RP foram divididos por mil (1000), sem prejuízo em sua interpretação.
Nota: Variável Dependente: Resultado Primário (RP); Variáveis Independentes: Desvio Orçamentário (DO) e Turbulência Orçamentária (TO).

As equações associadas aos modelos são as seguintes:

$$RP_{Pequenos} = 7514{,}38 - 2119{,}37DO_{pequenos} + 3196{,}58TO_{pequenos} - 696{,}12DO \times TO_{pequenos} + \varepsilon$$

$$RP_{médios} = -26936{,}22 + 34780{,}48DO_{médios} + 12629{,}41TO_{médios} - 1965{,}13DO \times TO_{médios} + \varepsilon$$

$$RP_{grandes} = -123331{,}94 + 230929{,}78DO_{grandes} + 9555{,}63TO_{grandes} - 81144{,}97DO \times TO_{grandes} + \varepsilon$$

O desvio orçamentário afetou negativamente o resultado primário dos municípios de pequeno porte, mas não dos municípios médios e grandes. Em contraste, a turbulência orçamentária afetou positivamente o resultado primário dos municípios de todos os portes.

As variáveis desvio orçamentário (DO) e turbulência orçamentária (TO) em conjunto afetam negativamente o resultado primário dos municípios de todos os portes. Nesse tocante, a ocorrência do desvio orçamentário concomitantemente com a turbulência orçamentária pode comprometer significativamente a execução orçamentária e assim afetar o seu principal objetivo que é proporcional o bem-estar social. Assim, a H3 foi confirmada para os municípios de todos os portes.

5. Conclusões

Os resultados apontaram que o resultado primário dos municípios pequenos é influenciado positivamente pela turbulência orçamentária e negativamente pela combinação da turbulência e do desvio orçamentário. Isso sugere que para os municípios pequenos, geralmente mais dependentes de transferência de recursos de outros entes, a turbulência orçamentária pode causar superávit primário. Se enfrentarem turbulência e desvio orçamentário no mesmo período, o resultado primário é afetado negativamente. O desvio orçamentário isoladamente contribuiu para déficit no resultado primário, advindo do desvio orçamentário de despesas correntes executadas com valores superiores aos orçados.

Nos municípios de médio porte, a turbulência orçamentária e o desvio orçamentário se apresentaram benéficos, pois afetaram positivamente o resultado primário, embora se presuma que isso ocorra quando o orçamento estiver se expandindo, ou seja, ocorra um aumento nas receitas correntes e uma estabilidade nas despesas correntes. Contudo, o desvio combinado com a turbulência orçamentária contribuíram para um déficit primário.

Nos municípios grandes, a turbulência e o desvio orçamentários não influenciaram negativamente o resultado primário, ao contrário, contribuíram para um superávit primário. Porém, a ocorrência combinada da turbulência e do desvio orçamentário em um mesmo exercício influenciou negativamente o resultado primário. Nesse caso, se conjectura que a maioria desses municípios apresentou turbulência caracterizada pelo aumento de receitas primárias e desvio originado pela execução de despesas primárias inferiores aos valores fixados no orçamento inicial.

Conclui-se que quando há redução da atividade econômica, que impacta na diminuição da arrecadação, os pequenos municípios são mais afetados do que os de médio e grande porte. Contudo, os municípios médios e grandes se beneficiam dos desvios orçamentários, que ocorrem quando o valor das despesas correntes executadas não coincidir com o *quantum* fixado. Os municípios de pequeno porte parecem suportar mais a turbulência orçamentária, dado o superávit primário, enquanto o desvio orçamentário mostrou-se maléfico, pois provocou déficit primário, assim como a ocorrência combinada de desvio e turbulência orçamentária. Os municípios grandes parecem menos afetados pelo desvio e turbulência orçamentária, pois apresentaram resultado primário positivo em ambas as situações.

Os resultados do estudo têm implicações para a literatura e a prática gerencial ao reforçarem que o superávit primário é um importante elemento da administração pública de governos locais, de forma que possa contribuir na criação de valor público. As evidências empíricas denotam que a turbulência

orçamentária subsidia essa criação de valor nos municípios de médio e grande porte. O desvio orçamentário colabora para a criação de valor em todos os portes. A ocorrência combinada do desvio e da turbulência orçamentária não contribui para a criação de valor público nos três portes. Portanto, os resultados sugerem que os municípios grandes são menos afetados pelo desvio orçamentário e pela turbulência e mais afetados com a combinação desses fatores.

O estudo apresenta limitações que precisam ser considerados na interpretação dos resultados. A pesquisa foi concentrada na análise de um período orçamentário, não sendo possível concluir que os resultados encontrados se repitam em outros períodos, sendo necessária assim a investigação de mais períodos para corroborar ou não os achados desse estudo. Outra limitação provém das variáveis independentes analisadas, sendo que outras variáveis podem influenciar a variável dependente, tanto do ambiente interno quanto externo, principalmente decisões políticas ou eventos inesperados, o que pode ser objeto de análise de futuras pesquisas sobre a temática investigada.

Referências

Afonso, J.R. (2016). Orçamento público no Brasil: História e premência de reforma. Espaço Jurídico Journal of Law, 17(1), 9-28. http://dx.doi.org/10.22409/rcj.v3i6.137

Alford, J., & O'flynn, J. (2009). Making sense of public value: concepts, critiques and emergent meanings. International Journal of Public Administration, 32(3-4), 171-191. https://doi.org/10.1080/01900690902732731

Ansell, C., & Trondal, J. (2018). Governing turbulence: an organizational-institutional agenda. Perspectives on Public Management and Governance, 1(1), 43-57. https://doi.org/10.1093/ppmgov/gvx013

Aquino, A.C.B., & Azevedo, R.R. (2017). Restos a pagar e perda da credibilidade orçamentária. Revista de Administração Pública, 5(4), 580-595.

Azevedo, R.R., & Aquino, A.C.B. (2016). O planejamento em municípios de pequeno porte em São Paulo. Revista de Contabilidade e Organizações, 10(26), 63-76. https://doi.org/10.11606/rco.v10i26.111202

Bajpai, A. (2017). "Valor Público" como uma estrutura normativa: Análise comparativa e reformulação da cultura administrativa na Índia e no Nepal. Revista Culturas Jurídicas, 3(6), 1-23. http://dx.doi.org/10.22409/rcj.v3i6.137

Bagdigen, M. (2005). An empirical analysis of accurate budget forecasting in Turkey. Dogus Universitesi Dergisi, 6(2), 190-201.

Benito, B., Guillamón, M.-D., & Bastida, F. (2015). Budget forecast deviations in municipal governments: Determinants and implications. Australian Accounting Review, 25(1), 45-70. https://doi.org/10.1111/auar.12071

Beuren, I.M., & Almeida-Santos, P.S. (2013). Relação entre transparência e reputação governamental. Journal Globalization, Competitiveness and Governability, 7(3), 89-102. https://doi.org/10.3232/GCG.2013.V7.N3.06

Beuren, I.M., & Zonatto, V.C.S. (2014). Perfil dos artigos sobre controle interno no setor público em periódicos nacionais e internacionais. Revista de Administração Pública, 48(5), 1135-1163. http://dx.doi.org/10.1590/0034-76121527

Bogoni, N.M., Hein, N., & Beuren, I.M. (2011). Análise da relação entre crescimento econômico e gastos públicos nas maiores cidades da região Sul do Brasil. Revista de Administracao Publica, 45(1), 159-179.

Boyne, G.A., & Meier, K.J. (2009). Environmental turbulence, organizational stability, and public service performance. Administration & Society, 40(8), 799-824. https://doi.org/10.1177/0095399708326333

Bryson, A.S., Crosby, J., & Bloomberg, E. (2017). Towards a multi-actor theory of public value co-creation. Public Management Review, 19(5), 640-654. https://doi.org/10.1080/14719037.2016.1192164

Calvo, M.C.M., Lacerda, J.T., Colussi, C.F., Schneider, I.J.C., & Rocha, T.A.H. (2016). Estratificação de municípios brasileiros para avaliação de desempenho em saúde. Epidemiologia e Serviços de Saúde, 25, 767-776. https://doi.org/10.5123/S1679-49742016000400010

Chohan, U.W., & Jacobs, K. (2017). Public value in politics: a legislative budget office approach. International Journal of Public Administration, 40(12), 1063-1073. http://dx.doi.org/10.1080/01900692.2016.1242612

Cruz, C.F., & Afonso, L.E. (2018). Gestão fiscal e pilares da Lei de Responsabilidade Fiscal: evidências em grandes municípios. Revista de Administração Pública, 52(1), 126-148. https://doi.org/10.1590/0034-7612165847

Denford, J.S., Dawson, G.S., Desouza, K.C., Manoharan, A.P. (2022). Assessing the relevance of governmental characteristics to address wicked problems in turbulent times. Public Management Review, ahead of print. https://doi.org/10.1080/14719037.2022.2124535

Fávero, L.P., & Belfiore, P. (2019). Data science for business and decision making. São Paulo: Academic Press.

Feld, L.P., Köhler, E.A., & Wolfinger, J. (2020). Modeling fiscal sustainability in dynamic macro-panels with heterogeneous effects: evidence from German federal states. International Tax Public Finance, 27, 215-239. https://doi.org/10.1007/s10797-019-09548-7

Fiirst, C., & Beuren, I.M. (2021). Influência de fatores contingenciais no desempenho socioeconômico de governos locais. Revista de Administração Pública, 55(6), p. 1355-1368.

Gerigk, W., & Clemente, A. (2012). Gestão financeira dos municípios brasileiros de porte médio. Revista Pretexto, 13(1), p. 34-59. https://doi.org/10.21714/pretexto.v13i1.1030

Geuijen, K., Moore, M., Cederquist, A., Ronning, R., & Twist, M. (2017). Creating public value in global wicked problems. Public Management Review, 19(5), 621-639. https://doi.org/10.1080/14719037.2016.1192163

Gomes, N.C., & Silva, M.C. (2022). Análise dos fatores explicativos do ranking da qualidade da informação contábil e fiscal. Journal Globalization, Competitiveness and Governability, 16(3), 101-116. https://doi.org/10.3232/GCG.2022.V16.N3.05

Hartley, J. (2011). Public value through innovation and improvement. In: Benington, J., & Moore, M. (eds). Public Value: theory and practice (pp. 171-184). Basingstoke: Palgrave Macmillan.

Hartley, J., Alford, J., Knies, E., & Scott, D. (2017). Towards an empirical research agenda for public value theory. Public Management Review, 19(5), 670-685. https://doi.org/10.1080/14719037.2016.1192166

Johansson, T., & Siverbo, S. (2014). The appropriateness of tight budget control in public sector organizations facing budget turbulence. Management Accounting Research, 25(4), 271-283. https://doi.org/10.1016/j.mar.2014.04.001

Marôco, J. (2014). Análise estatística com o SPSS statistics (6. ed.). Pêro Pinheiro: ReportNumber.

Martins, P., & Correia, L. (2015). Determinantes dos desvios orçamentais nos municípios portugueses. Revista Portuguesa de Estudos Regionais, 39, 41-64.

Paganotto, J.F., Oliveira, J.C., & Antunes, G.A. (2017). Gerenciamento do resultado primário brasileiro: análise dos dividendos pagos por BNDES e CEF ao Tesouro Nacional. Revista Universo Contábil, 13(2), 65-88. https://doi.org/10.4270/ruc.2017209

Pekovic, S., Grolleau, G., & Mzoughi, N. (2018). Environmental investments: too much of a good thing?. International Journal of Production Economics, 197, 297-302. https://doi.org/10.1016/j.ijpe.2018.01.012

Piza, E.C. (2019). Determinantes dos desvios de execução da política fiscal no Brasil. Revista de Economia e Agronegócio, 17(2), 210-233. https://doi.org/10.25070/rea.v17i2.7939

Revorêdo, C.R.S.C., Silva, M.C., Silva, J.D.G., & Libonati, J.J. (2021). Fatores explicativos da eficácia da despesa orçamentária dos municípios brasileiros. Journal Globalization, Competitiveness and Governability, 15(1), 71-87. https://doi.org/10.3232/GCG.2021.V15.N1.03

Seal, W., & Ball, A. (2011). Interpreting the dynamics of public sector budgeting: a dialectic of control approach. Financial Accountability & Management, 27(4), 409-436. https://doi.org/10.1111/j.1468-0408.2011.00531.x

Sell, F.F., Beuren, I.M., & Lavarda, C.E.F, (2020). Influência de fatores contingenciais no desempenho municipal: evidências inferenciais. Revista de Contabilidade e Organizações, 14, e164058, 2020. doi: https://doi.org/10.11606/issn.1982-6486.rco.2020.164058

Stamm, C., Staduto, J.A.R., Lima, J.F., Wadi, Y.M. (2013). A população urbana e a difusão das cidades de porte médio no Brasil. Interações, 14(2), 251-265. https://doi.org/10.1590/S1518-70122013000200011

R E V I S T A | J O U R N A L | R E V I S T A
Globalización, Competitividad y Gobernabilidad | Globalization, Competitiveness & Governability | Globalização, Competitividade e Governabilidade

GCG
The Journal *of* Globalization, Competitiveness, and Governability

Cryptocurrencies Accounting Treatment

AREA: 1
TYPE: Application

Tratamento Contábil das Criptomoedas
Tratamiento Contable de las Criptomonedas

AUTHORS

Matheus de Lima Marques
niversidade Federal do Rio de Janeiro, Brasil
mrmattmarques@gmail.com

Odilanei Morais dos Santos[1]
Universidade Federal do Rio de Janeiro, Brasil
odilanei@facc.ufrj.br

1. Corresponding author: Av. Pasteur, 250, sala 250. Urca. Brasil, Rio de Janeiro/RJ. 22.290-240

We examine the perspectives of Brazilian accounting professors on the accounting treatment of cryptocurrencies. Experts have established a moderate consensus among the situations examined for the circumstances in which an entity buys cryptocurrencies for itself and in cases where an entity produces cryptocurrencies (mining). In such circumstances, the initial recognition should be a financial instrument, and the initial and subsequent measurement should be at fair value. This understanding differs from the prevailing literature, which states that cryptocurrencies cannot be recognized as a financial instrument. There are also disagreements about the initial and subsequent measurements. As a result, the accounting regulatory framework must be updated so that cryptocurrencies can be recognized, measured, and disclosed more reliably.

Examinamos as perspectivas de professores brasileiros de contabilidade sobre o tratamento contábil das criptomoedas. Os especialistas estabeleceram um consenso moderado entre as situações examinadas para as circunstâncias em que uma entidade compra criptomoedas para si e nos casos em que uma entidade produz criptomoedas (mineração). Em tais circunstâncias, o reconhecimento inicial deveria ser como um instrumento financeiro e a mensuração inicial e subsequente a justo valor. Esse entendimento difere da literatura predominante, que afirma que as criptomoedas não podem ser reconhecidas como um instrumento financeiro. Há também discordâncias sobre as mensurações iniciais e subsequentes. Como resultado, o marco regulatório contábil deve ser atualizado para que as criptomoedas possam ser reconhecidas, mensuradas e divulgadas de forma mais confiável.

Examinamos las perspectivas de los profesores brasileños de contabilidad sobre el tratamiento contable de las criptomonedas. Los expertos establecieron un consenso moderado entre las situaciones examinadas para las circunstancias en que una entidad compra criptomonedas para sí y en los casos en que una entidad produce criptomonedas (minería). En tales circunstancias, el reconocimiento inicial debería ser un instrumento financiero y la valoración inicial y posterior al valor razonable. Este entendimiento difiere de la literatura predominante, que afirma que las criptomonedas no pueden ser reconocidas como un instrumento financiero. También hay desacuerdos sobre las valoraciones iniciales y posteriores. Como resultado, el marco regulatorio contable debe actualizarse para que las criptomonedas puedan ser reconocidas, valoradas y divulgadas de manera más fiable.

DOI	Received	Accepted
10.58416/GCG.2024.V18.N1.03	01.07.2023	04.09.2023

GCG
The Journal *of* Globalization, Competitiveness, and Governability

1. Introduction

The growing acceptance of cryptocurrencies in commercial transactions encourages discussions regarding their recognition and measurement as an item of value to their holder. Among the cryptocurrencies used in digital media, Bitcoin deserves to be spotlighted due to its current value and the magnitude of transactions (Dinkins, 2017; Chuen et al., 2018; Alsami et al., 2023; Bommer et al., 2023; Hubbard, 2023).

According to Hayes (2017) and Subačienė and Kurauskienė (2020), there is a market still under development but "vibrant" and the recognition of cryptocurrencies as an emerging asset class. Due to the worldwide computer network and the speed, it provides for the transmission of information, cryptocurrency has spread rapidly, being recognized, and accepted as a means of payment for goods and services worldwide and becoming an essential part of the global economy (Teh et al., 2020; Ferreira & Sandner, 2021; Bommer et al., 2023).

Previous studies testify that cryptocurrencies are used in two functions: as currency, in goods and services markets, and as an asset in the financial market (Dong & Dong, 2014; Baur et al., 2018; Bianchi, 2020). Conceptualizing it involves identifying points of contrast or resemblance with payment methods, digital currency, stocks, and commodities. Moreover, cryptocurrencies have become the buzzword in society, especially after some companies such as Wikipedia, Microsoft, and Amazon have come to accept the use of cryptocurrencies (Teh et al., 2020), making them extremely popular among individual investors and consumers (Hubbard, 2023).

However, an official technical position on this subject by international regulatory institutions is incipient (Ram et al., 2016; Procházka, 2018; Brezoeva, 2020; Subačienė & Kurauskienė, 2020; Shehada & Shehada, 2020) and the rapid growth of the crypto-assets ecosystem has intensified the focus of regulators (Ferreira & Sandner, 2021). The regulatory board of Japan - Accounting Standards Board of Japan (ASBJ), the Australian Accounting Standards Board (AASB) of Australia, the International Accounting Standards Board (IASB), and some others started discussions and have some publications on the subject.

The study aims to present the possible models of the accounting treatment for recognizing and measuring cryptocurrencies based on the opinion of Brazilian academics specializing in accounting. We used the Delphi technique, interviewing experts on the subject, to obtain a consensus on the topic, and, with this, indicate how companies can recognize and measure cryptocurrencies in their financial statements.

Keywords
Accounting. Cryptocurrency. Bitcoin. IFRS. Delphi.

Palavras-chave
Contabilidade. Criptomoedas. Bitcoin. IFRS. Delphi.

Palabras clave
Contabilidad. Criptomoneda. Bitcoin. NIIF. Delphi.

JEL Codes
G39, G53, G59

This is a study that addresses a current theme, whose literature is still under development, giving the possibility of contributing to the accounting literature and regulation, given that the results may be used by regulatory bodies in by regulatory bodies in eventual accounting regulation. The differential of the research on the accounting aspects of cryptocurrencies lies in the use of interviews with experts in order to present a consensus view on the appropriate accounting treatment of an uprising asset class.

2. Literature Review

Cryptocurrencies are digital currencies that use cryptographic techniques to regulate the generation of currency units and verify the transfer of money, operating independently from a central bank (DeVries, 2016). Ernest Young (2018) points out that Bitcoin and Ethereum are the most famous examples of cryptocurrencies and have the following characteristics: (a) They are created through “mining”, which consists of using computational strength to solve complex cryptographic algorithms; (b) There is not an entity that regulates its use; (c) Its value is based on the law of supply and demand only; and (d) Its general purpose is to be used in exchange for goods or services.

The issue addressed in this study is the accounting regulating of cryptocurrencies. Considering this aspect, there is an effort by accounting regulatory bodies, such as AASB, ASBJ, and IASB, and auditing companies, such as PwC, Delloite, Ernest & Young, and Gran Thronton, to understand, through an accounting analysis, cryptocurrencies, and their respective applicability. In this context, AASB (2016), ASBJ (2018), PwC (2018), Brezoeva (2020), Luo & Yu (2022), and Jackson & Luu (2023) argue that the current accounting standards do not provide sufficient guidance for companies to disclose useful financial accounting information regarding transactions with cryptocurrencies, proposing, each as to its form, the need to update the current conceptual framework. Differently, Chou et al. (2022) understand that the principles of current accounting standards are robust enough to address gaps in accounting requirements for crypto assets.

Cryptocurrencies are like computer files, like an mp3 or a text file, and can be destroyed or lost just like money. They are stored both on a computer and on a trusted website that offers such a service. As they are like files stored on a computer, spending them is like sending them from one user to another, such as sending an e-mail over the internet (Kaplanov, 2012; Plassaras, 2013; DeVries, 2016).

Individual cryptocurrency transactions are encrypted, logged on a decentralized peer-to-peer network operated and maintained by thousands of independent computers worldwide, and recorded in a public ledger (Sheridan, 2011; DeVries, 2016). This public ledger, known as blockchain, records which cryptocurrencies were negotiated but does not record the identity information of the parties that traded them. Thus, bringing security and anonymity to its users.

There are three ways for anyone to access cryptocurrencies. To begin, users can buy cryptocurrencies by exchanging "real money", such as the Brazilian actual and the US Dollar, for cryptocurrencies. The price of a cryptocurrency varies against other currencies, just like in a traditional foreign exchange market, and

is determined by supply and demand. Users can also obtain them by exchanging products or services like they would with traditional cash. Finally, the final method of obtaining a cryptocurrency is through a process known as mining.

Mining allows you to generate cryptocurrencies instead of acquiring them. As no company manages this process, miners use their computers voluntarily to solve multiple mathematical problems (complex computer algorithms). The Bitcoin algorithm, for example, restricts the total number of bitcoins in circulation. This enables miners to go through a verification process for each Bitcoin transaction in exchange for a reward for creating a block. Bitcoin distribution software decreases its production over time so that there are no more than 21 million Bitcoins in circulation, something that should happen around the year 2140, according to Plassaras (2013), Antonopoulos (2015), Yermack (2015) and Narayanan et al. (2016). This gradual decline in the Bitcoin supply removes any human intervention. This means this currency is not subject to an inflationary whim if a central bank decides to print more money or any other kind of government intervention (Plassaras, 2013).

Ram (2015) can be considered the first in the academy to research the topic of cryptocurrency accounting. However, his finding presents only a general outline of how cryptocurrencies could be recognized and measured. It did not consider other possible cases of application and use. Morozova et al. (2020) focus on a practical analysis of the current accounting policies of companies operating with crypto assets, considering the position of the International Financial Reporting Interpretations Committee (IFRIC). It was concluded that the most promising way out of the conflict of interests of business and the current rules of International Financial Reporting Standards (IFRS) is to refine the existing standards and introduce rules of classification and evaluation of crypto assets.

Subačienė and Kurauskienė (2020) evaluated the alternatives to cryptocurrency accounting. Although various authors and accounting standards regulators provide their insights and recommendations on cryptocurrency accounting, the results indicate that a unified system has not been formed yet. Currently, such alternatives of cryptocurrency accounting as financial assets, intangible assets, or inventory. Ferreira and Sandner (2021) evaluate the EU's current regulatory approach to crypto assets against the views and reports of several advisory and supervisory bodies, international organizations, and market developments.

Ramassa and Leoni (2022) explore how the International Accounting Standards Board has dealt with the emerging issue of accounting for cryptocurrencies by investigating its constituents' expectations and the motivations underlying its regulatory response. The results show the constituents ask for new solutions and the IASB tries to resist such pressures, while defending its position, despite criticism from constituents and Board members.

Hubbard (2023) asserts that current accounting guidance has been deemed ineffective. He examines potential financial accounting treatments for cryptocurrencies and provides insights into the most appropriate financial accounting treatment of cryptocurrencies. It indicates that the best option is an intangible asset revaluation model that allows firms to elect a fair value option. Pramana et al. (2023), in turn, indicate that the most acceptable treatment for crypto assets under IFRS is as intangible assets and inventory.

France et al. (2022) evaluated the application of accounting standards in recognizing cryptocurrencies in Indonesian companies. The results show that the Indodax Company uses IAS 2 (inventory) because the company's core business is in brokerage, which measures cryptocurrency inventory recorded at

fair value after deducting costs to sell and is recognized in the income statement and reported in the Available for sale financial asset account. In addition, entities that measure and value cryptocurrency assets (cash and tokens), use IFRS 9 to record them as financial assets at fair value through profit or loss.

Luo and Yu (2022) compare US and international accounting and financial reporting practices for cryptocurrency. They document inconsistency between Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS) and distortions that can mislead users in assessing asset value, liquidity, profitability, and cash-generating abilities across firms. In general, companies classify as intangibles using different measurement bases. They conclude that limited guidance about crypto assets from both IFRS and USGAAP lets companies choose which existing standard to apply and how to apply it. Alsalmi et al. (2023) reach similar conclusions, that current accounting standards do not precisely cover the accounting treatment of digital currencies.

Jackson and Luu (2023) assess potential treatments under current GAAP, namely as intangibles, inventory, or financial instruments. They provide policy advice to standard setters, with a call to either develop a new stand-alone standard or to amend the definition of financial instruments to include cryptocurrencies, to allow greater comparability and understandability in firms' reporting.

Differently, Chou et al. (2022) show that unless crypto-assets have economic characteristics and functionality that are pervasive enough to warrant a new accounting standard, principles of current accounting standards are robust enough to address gaps in accounting requirements for crypto-assets.

It is noticed that the literature indicates different accounting treatments of how to recognize and measure cryptocurrencies, given the current regulatory gaps. Thus, based on this literature, the understanding of Brazilian experts on the subject is sought, aiming to obtain a consensus on the best accounting treatment.

3. Methodology

Our population of specialists were the Brazilian professors in financial accounting of all the postgraduate courses in accounting (30 programs from five regions of Brazil). We conducted a thorough analysis of their resumes to identify those who could opine on the accounting treatment of cryptocurrencies, resulting in a total of 71 experts. However, it is impossible to guarantee that they are the ones who really master the subject. Concerning this aspect, Marei et al. (2023) show that recent accounting graduates and CPA members have the slightest awareness of cryptocurrencies, likely due to a lack of professors' comprehension or exposure to the concept. This is a possible limitation, but we believe academics should be sculpted on the topic. Our choice was to use a specialist profile more focused on the academy.

There is no precise determination of the number of specialists applying the Delphi technical. Okoli and Pawlowski (2004), establish a number between 10 to 18 participants, and Giovinazzo (2001), between

15 and 30. Brito (2016), Cunha (2007), Lyra (2008), Miranda (2011), and Vieira (2009) point out that the dissertations and theses in the accounting area that used the Delphi technique have a number between 12 and 21 expert respondents. We used Google Forms to apply the questionnaire to specialists in the second half 2020. The number of survey respondents is adherent to the literature.

The questionnaire was prepared from a presentation containing a synthesis of the primary information on the recognition and measurement of cryptocurrencies collected from the literature for each question. Based on the literature and publications from international accounting authorities, we prepared the first-round questionnaire to identify potential elements for the accounting treatment of cryptocurrencies linked to initial recognition, initial measurement, and subsequent measurement. We created four possible scenarios of the use of cryptocurrencies by companies, for which experts should opine as "agree" or "do not agree" for each proposed accounting treatment described in factors 1, 2, and 3 (Table 1). Os cenários e critérios de reconhecimento e mensuração foram baseados em AASB (2016), ASBJ (2018), Delloite (2018), IASB (2019), France et al. (2022), Luo and Yu (2022), Jackson and Luu (2023) and Hubbard (2023).

Table 1 - Scenarios of the use of cryptocurrencies and recognition and measurement criteria

Scenarios	*Factor 1: Initial Recognition*	*Factor 2: Initial Measurement*	*Factor 3: Subsequent Measurement*
1. An entity acquires cryptocurrencies for itself maintains them and may dispose of them in the future.	Asset in general, Commodity, Inventories, Financial Instrument or Intangible?	Cost Value, Net Realizable Value or Fair Value?	Cost Amount, Amortized Cost, Net Realizable Value or Fair Value?
2. An entity receives cryptocurrencies as a means of payment for goods or services provided.			
3. An entity is a cryptocurrency broker and keeps it safe in favor of its customers.			
4. An entity is a cryptocurrency miner; that is, its activity is to produce cryptocurrencies.			

The items of each factor received an evaluation of “agree” and “do not agree”, and those that obtained a more significant agreement were used for the second round. The literature on the Delphi technique does not establish a rule for carrying out the statistical treatment of the responses obtained (Brito, 2016). For this work, the statistical measures used to evaluate the responses were the mean, mode, minimum, maximum, standard deviation, and variation coefficient.

We tabulated the data from the first round to provide feedback to the specialists, that is, to show the percentage of agreement/disagreement for each item and each factor. A new questionnaire covered the items with the highest agreement for each factor, thus converging on possible models of accounting treatment related to the recognition and measurement of cryptocurrencies. In this research, two rounds were applied once after analysis of the responses of the second round, and there was a stabilization of the experts' opinions, as suggested by Miranda (2011).

The experts' responses should express the magnitude of agreement with each model presented, which ranged from 1 to 5 points, with 1 being total disagreement and 5 being total agreement. With that done, it was possible to calculate the average score of each proposal and the variation coefficient. Green et al. (1999) suggest focusing on the 80% consensus goal to determine the consensus in the second round. The Variation Coefficient (VC) is the parameter for measuring this stability between rounds. We used the mean score of the experts for this purpose.

Then, we divided the consensus into three categories: high-level, moderate, and no consensus. A VC of up to 15% and a mean of at least 4.5 was accepted for high-level consensus. A VC of up to 30% and a mean greater than 4 were accepted for the moderate consensus. Without consensus, it was enough not to fit into the other types, such as a VC greater than 30% and a mean less than 4. It also used the mode and comments received from experts for qualitative analysis.

4. Results

4.1. Specialists Characterization

The Delphi technique was performed in two non-face-to-face rounds to obtain a consensual position on the best accounting treatment for cryptocurrencies. Of the 71 invited to the expert committee, 21 participated in the first round. The second round had four abstentions, getting 17 participants. Of the 21 respondent specialists, all were PhDs. Eighteen specialists have been professors for more than 10 years, demonstrating that the interviewees are experienced academics in the accounting area of research interest. The sample includes specialists from 16 universities and all four Brazilian regions (the northern region does not have a postgraduate course in accounting). There was no significant concentration of respondents from the same university and the geographical distribution represents the distribution of courses in Brazil. Thus, it can be considered that the sample represents the Brazilian reality. The data can be seen in **Table 2**.

Table 2 - Specialists Characterization

Reference	*Postgraduate*	*Region*	*Experience (years)*
Expert 1	University 3	Southeast	10 – 20
Expert 2	University 14	South	5 – 10
Expert 3	University 14	South	10 – 20
Expert 4	University 14	South	10 – 20
Expert 5	University 5	Northeast	Less than 5
Expert 6	University 4	South	10 – 20
Expert 7	University 7	Midwest	20 – 30
Expert 8	University 11	South	5 – 10

Expert 9	University 10	South	20 – 30
Expert 10	University 5	Northeast	10 – 20
Expert 11	University 12	South	20 – 30
Expert 12	University 8	Northeast	10 – 20
Expert 13	University 13	South	20 – 30
Expert 14	University 2	South	20 – 30
Expert 15	University 6	Midwest	20 – 30
Expert 16	University 1	Southeast	10 – 20
Expert 17	University 9	South	10 – 20
Expert 18	University 8	Northeast	20 – 30
Expert 19	University 15	Southeast	10 – 20
Expert 20	University 16	Southeast	More than 30
Expert 21	University 11	South	20 – 30

4.2. Results Presentation

4.2.1. First Round

In the first round, recognizing cryptocurrencies as an Asset is almost unanimous in the cases addressed, scoring 100% agreement in three of the four scenarios and 81% agreement in the other. Also, within the Initial Recognition factor, the item that showed the greatest agreement in all scenarios was the Financial Instrument. There is a slight dispute between Cost Value and Fair Value for the Initial Measurement factor. There is an agreement tie in scenarios 2 and 3, whereas in scenarios 1 and 4, the Fair Value presented the highest agreement. The Fair Value had the highest agreement for the Subsequent Measurement Factor in all scenarios. **Table 3** presents the results of this round.

Table 3 - First-round results

	Agreement Percentage			
	Scenario 1	*Scenario 2*	*Scenario 3*	*Scenario 4*
Factor 1 - Initial Recognition				
Asset	100,00%	100,00%	81,00%	100,00%
Commodity	23,80%	19,00%	23,80%	33,30%
Inventories	4,80%	4,80%	23,80%	14,30%
Financial Instrument	76,20%	81,00%	47,60%	57,10%
Intangible	14,30%	14,30%	4,80%	28,60%

Factor 2 – Initial Measurement				
Cost Value	47,60%	52,40%	42,90%	42,90%
Net Realizable Value	9,50%	4,80%	9,50%	9,50%
Fair Value	61,90%	52,40%	42,90%	61,90%
Factor 3 –Subsequent Measurement				
Cost Value	0,00%	0,00%	14,30%	9,50%
Amortized Cost	4,80%	0,00%	0,00%	9,50%
Net Realizable Value	23,80%	23,80%	33,30%	14,30%
Fair Value	85,70%	85,70%	57,10%	85,70%

In addition to issuing their opinions of agreement or disagreement with the accounting treatment of cryptocurrencies, the experts were asked for opinions on the items evaluated in the questionnaire, suggestions for other items if they found them valid, and comments on the survey.

4.2.2. Second Round

Before applying the second-round questionnaire, we presented the results obtained in the first round (the agreement percentage regarding the items of each factor in each case) to the experts (see **Table 3**). The items of each factor that obtained the greatest agreement were condensed into possible models of accounting treatment to be voted on by the experts in the second round. As pointed out in the first-round results, there was a tie in the Initial Measurement factor in scenarios 2 and 3. Then, two options for the accounting treatment model for these scenarios were elaborated. The accounting models proposed for each case are as follows:

Accounting Models Proposed	*Initial Recognition*	*Initial Measurement*	*Subsequent Measurement*
Scenario 1	Financial Instrument	Fair value	Fair value
Scenario 2	-	-	-
Option 1	Financial Instrument	Cost value	Fair value
Option 2	Financial Instrument	Fair value	Fair value
Scenario 3	-	-	-
Option 1	Financial Instrument	Cost value	Fair value
Option 2	Financial Instrument	Fair value	Fair value
Scenario 4	Financial Instrument	Fair value	Fair value

In this round, we asked the specialists to express their agreement with each model presented, varying from 1 to 5 points, where 1 is total disagreement, and 5 is total agreement. See **Table 4** for the results of the second round.

Table 4 - Second-round results

Accounting Models Proposed	*1*	*2*	*3*	*4*	*5*	*Mean*	*Mode*	*CV*
Scenario 1	1	0	2	3	11	4.35	5	25.61%
Scenario 2								
Option 1	3	5	1	3	5	3.12	2 e 5	50.57%
Option 2	3	0	1	5	8	3.88	5	38.51%
Scenario 3								
Option 1	3	5	0	4	5	3.18	2 e 5	50.07%
Option 2	5	3	0	5	4	3.00	1 e 4	55.28%
Scenario 4	2	0	1	6	8	4.06	5	31.97%

Analyzing each scenario individually, the results show that:

(a) Scenario 1 presented an average of 4.35 and a VC of 25.61%, which means an average dispersion and a moderate consensus.
(b) Scenario 2 (Option 1) presented a mean of 3.12 and a VC of 50.57%, which means a high dispersion. Therefore, there is no consensus.
(c) Scenario 2 (Option 2) presented a mean of 3.82 and a VC of 39.49%, considered high dispersion. Despite presenting a relevant score above the mean, it also had many scores below the mean, making it express an absence of consensus among the specialists.
(d) Scenario 3 (Options 1 and 2) presented a mean of 3.18 and 3.00 and a VC of 50.07% and 55.28%, respectively for options 1 and 2, which means a high dispersion. The scores were diverse and well-illustrated by the sample's mode. These data frame scenario 3 has no consensus.
(e) Scenario 4 presented a mean of 4.06 and a VC of 31.97%, indicating a moderate consensus (above 30%). At first glance, these data suggest a failure to fit into the previously raised consensus profiles. However, its mode is 5, and 82.35% of the experts (14 out of 17 specialists) scored above average, with only 2 out of the 17 experts voting against the model presented (read vote equal to 1). Therefore, with such information, plus the mean presented, whose value is 4.06, most experts favor this model, thus concluding with a moderate consensus in general.

4.3. Results Discussion

A moderate consensus was reached in scenarios 1 and 4, while scenarios 3 and 4 did not show consensus at the end of two rounds. Scenario 1 referred to an entity that acquires cryptocurrencies for itself, maintains them, and may dispose of them in the future, and scenario 4 referred to a mining entity, whose activity is to produce (or mine) cryptocurrencies. In both cases, the consensual accounting treatment was recognized as a Financial Instrument and Fair Value for initial and subsequent measurement.

The literature points out that it is not possible to recognize cryptocurrencies as a Financial Asset under any circumstances, whether as cash, cash equivalent, foreign currency, or financial instrument, going against what was moderately converged among the experts interviewed as ideal for the scenarios 1 and 4 (AASB, 2016; ASBJ, 2018, Delloite, 2018; PWC, 2018; IASB, 2019; France et al., 2022; Jackson & Luu,

2023). This brings us back to Jackson and Luu's (2023) considerations for changing the definition of financial instruments to include cryptocurrencies.

Some Brazilian experts point out that cryptocurrencies may be recognized as cash, but some criteria must be met first. For the IASB and AASB, the criteria are that they must be used as a means of exchange and as the monetary unit in the pricing of goods or services to the point that it is the basis by which all transactions are measured and recognized in the Financial Statements. This understanding is consistent with Chou et al. (2022), that developing new accounting standards would depend on the further expansion of cryptocurrencies in economic terms and functionality.

For initial recognition, the literature points to the existence of three other possible ways for the recognition of cryptocurrencies, either as an intangible asset (IAS 38), inventories (IAS 2), or as commodities (IAS 2) (France et al., 2022; Jackson & Luu, 2023; Alsami et al., 2023; Bommer et al., 2023; Pramana et al., 2023). Although the established scenarios have contemplated these recognition possibilities, a consensus was not reached among Brazilian experts. This is somewhat surprising evidence since there is a predominance in the literature of treatment as an intangible asset (Hubbard, 2023). On the other hand, the opinion of the specialists interviewed in this research converges with literature and the ASBJ point of view when proposing the measurement of cryptocurrencies at fair value, initially and subsequently, proving to be the most acceptable way in a possible accounting regulation.

5. Conclusion

The goal of the present paper was to present the possible models of the accounting treatment for the recognition and measurement of cryptocurrencies based on the opinion of Brazilian professors specialized in financial accounting. For that, the method chosen to carry out this research was Delphi, which is used to obtain a consensual opinion from a group of specialists through questionnaires interspersed with comments.

Considering the accounting conceptual framework, the opinion of the specialists interviewed, and the literature explored, we concluded that the normative accounting framework needs updating for cryptocurrencies to be recognized, measured, and disseminated in the most reliable way possible. Cryptocurrencies can even be embedded in some types of assets, but these types of assets, in their respective theoretical frameworks, do not present the proper accounting for cryptocurrencies.

Cryptocurrencies could be considered as currencies if so agreed. However, as IASB (2019) brought to the discussion, if it does not reach a point at which an entity's financial statements are presented based on a given cryptocurrency, then it cannot be recognized as a currency. However, suppose it reaches a point where an entity buys, pays, receives, and records its accounting facts based on a cryptocurrency. Why not recognize cryptocurrencies as a currency or cash for accounting purposes? Thus, if a company acquires cryptocurrencies for investment, future appreciation, or mere speculation, why not recognize them as a financial instrument and update them at fair value? Or recognize them as intangible, updating them to fair value?

The answer is that the form has prevailed over the economic substance of the transactions, which impedes progress from a regulatory point of view. The idea is not to create more rules to tighten the conceptual structure but to make it more flexible to increase the current range of possibilities. The present study presented a brief discussion, which, as demonstrated by the results, requires more debate in the academy. The discussion on the topic addressed does not end here with these results. The need for a viable north persists.

Our results can be used for future research, as a basis for discussion with experts other than academics, or for future public hearings in discussing a standard or technical interpretation. As a limitation of the results presented in the study, there was no consensus in scenarios 2 and 3 and, for scenarios 1 and 4, a divergence between the position of accounting regulatory bodies. Therefore, this may mean that respondents have little knowledge of the essence of cryptocurrency transactions. Alternatively, it may show that this topic is difficult to understand, given that even the accounting regulatory bodies do not express, in their discussions, an alignment of ideas.

References

Alsalmi, N., Ullah, S., Rafique, M. (2023). Accounting for digital currencies. Research in International Business and Finance. 64, 2-10. https://doi.org/10.1016/j.ribaf.2023.101897

Antonopoulos, A.M. (2014). Mastering Bitcoin: Unlocking digital cryptocurrencies. O'Reilly Media, Inc.

Accounting Standards Board of Japan. (2018). Practical solution on the accounting for virtual currencies under the Payment Services Act. ASAF meeting, April 2018, Agenda Paper 3B. Retrieved from https://www.asb.or.jp/en/wp-content/uploads/2018-0315_2_e.pdf

Baur, D.G., Hong, K., & Lee, A. (2018). Bitcoin: medium of exchange or speculative assets? Journal of International Financial Markets, Institutions and Money. 54(C), 177-189. https://doi.org/10.1016/j.intfin.2017.12.004

Bianchi, D. (2020). Cryptocurrencies as an asset class? An empirical assessment. The Journal of Alternative Investments. 23(2), 162-179. https://doi.org/10.3905/jai.2020.1.105

Bommer, W.H., Milevoj, E., Rana, S. (2023). The intention to use cryptocurrency: A meta-analysis of what we know. Emerging Markets Review. 55, 1-16. https://doi.org/10.1016/j.ememar.2022.100962

Brito, N.D.D.C. (2016). The success of individual microentrepreneurs in Brazil. Master's Dissertation. São Paulo University. https://doi.org/10.11606/D.12.2016.tde-25072016-153809

Brezoeva, B. (2020). The cryptocurrency - accounting challenge. Nauchni Trudove. 1, 53-75. Retrieved from https://ideas.repec.org/a/nwe/natrud/y2020i1p53-75.html

Chou, J.H., Agrawal, P., & Birt, J. (2022). Accounting for crypto-assets: stakeholders' perceptions. Studies in Economics and Finance. 39(3), 471-489. https://doi.org/10.1108/SEF-10-2021-0469

Chuen, D.L.K., Guo, L., & Wang, Y. (2018). Cryptocurrency: a new investment opportunity? The Journal of Alternative Investments Winter. 20(3), 16-40. https://doi.org/10.3905/jai.2018.20.3.016

Cunha, J.V.A. (2007). Accounting PhD graduates from FEA/USP: analysis in light of human capital theory. Doctoral Thesis. São Paulo University.

Delloite. (2018). Classification of cryptocurrency holdings. Retrieved from https://www2.deloitte.com/us/en/pages/audit/articles/fra-classification-of-cryptocurrency-holdings.html

DeVries, P.D. (2016). An analysis of cryptocurrency, bitcoin, and the future. International Journal of Business Management and Commerce. 1(2). 1-9. https://www.ijbmcnet.com/images/Vol1No2/1.pdf

Dinkins, D. (2017) Satoshi's best kept secret: Why is there a 1MB limit to Bitcoin block size. Retrieved from https://cointelegraph.com/news/satoshis-best-kept-secret-why-is-there-a-1-mb-limit-to-bitcoin-block-size

Dong, H., Dong, W. (2014). Bitcoin: Exchange rate parity, risk premium, and arbitrage stickiness. British Journal of Economics, Management & Trade. 5(1), 105-113. https://doi.org/10.9734/bjemt/2015/13308

Ernest Young. (2018). IFRS – Accounting for crypto-assets. Retrieved from https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/$File/EY-IFRS-Accounting-for-crypto-assets.pdf

Ferreira, A., Sandner, P. (2021). EU search for regulatory answers to crypto assets and their place in the financial markets' infrastructure. Computer Law & Security Review. 43, 2-15. https://doi.org/10.1016/j.clsr.2021.105632

France, M., Janggur, M., Nugrahanti, T.P. (2022). Implementation of accounting standards for cryptocurrency companies in Indonesia. Journal of Asian Business Strategy, 12(2), 139-149. https://doi.org/10.55493/5006.v12i2.4680

Giovinazzo, R.A. (2001). Modelo de aplicação da metodologia Delphi pela internet: vantagens e ressalvas. Revista Administração On Line. 2(2). http://www.fecap.br/adm_online/art22/renata.htm.

Grant Thornton. (2018). Accounting for cryptocurrencies – the basics. Retrieved from https://www.grantthornton.global/en/insights/viewpoint/accounting-for-cryptocurrencies--the-basics/

Hayes, A.S. (2017). Cryptocurrency value formation: An empirical study leading to a cost of production model for valuing bitcoin. Telematics and Informatics. 34(7), 1308-1321. https://doi.org/10.1016/j.tele.2016.05.005

Hubbard, B. (2023). Decrypting crypto: implications of potential financial accounting treatments of cryptocurrency. Accounting Research Journal. Ahead-of-print. https://doi.org/10.1108/ARJ-10-2022-0279

International Accounting Standards Board (2018a). Holdings of cryptocurrencies. IFRS® Interpretations Committee meeting. Agenda ref 4A.

International Accounting Standards Board (2018b). Possible standard setting – Holdings of cryptocurrencies. IFRS® Interpretations Committee meeting. Agenda ref 4B.

International Accounting Standards Board (2019a). IFRIC Update March 2019 – Holdings of Cryptocurrencies. IFRS® Interpretations Committee. Agenda Paper 4. Retrieved from https://www.ifrs.org/news-and-events/updates/ifric-updates/march-2019/

International Accounting Standards Board (2019b. IFRIC Update June 2019 – Holdings of Cryptocurrencies. IFRS® Interpretations Committee. Agenda Paper 12. Retrieved from https://www.ifrs.org/news-and-events/updates/ifric-updates/june-2019/

Jackson, A., Luu, S. (2023). Accounting for digital assets. Australian Accounting Review. Ahead-of-print. https://doi.org/10.1111/auar.12402

Kaplanov, N. (2012). Nerdy money: Bitcoin, the private digital currency, and the case against its regulation. Loyola Consumer Law Review. 25(1), 111-174. Retrieved from https://lawecommons.luc.edu/cgi/viewcontent.cgi?article=1920&context=lclr

Lyra, R.L.W.C. (2008). Análise hierárquica dos indicadores contábeis sob a óptica do desempenho empresarial. Doctoral Thesis. São Paulo University.

Luo, M., Yu, S. (2022). Financial reporting for cryptocurrency. Review of Accounting Studies. https://doi.org/10.1007/s11142-022-09741-w

Marei, Y., Almasarwah, A., Al Bahloul, M., & Afifa, M.A. (2023). Cryptocurrencies in accounting schools? Higher Education, Skills and Work-Based Learning. Ahead-of-print. https://doi.org/10.1108/HESWBL-12-2022-0284

Miranda, G.J. (2011). Relations between the faculty qualifications and the student's performance in Brazilian undergraduate programs in accountancy. Doctoral Thesis. São Paulo University.

Morozova, T., Akhmadeev, R., Lehoux, L., Yumashev, A.V., Meshkova, G.V., Lukiyanova, M. (2020). Crypto asset assessment models in financial reporting content typologies, Entrepreneurship and Sustainability Issues. 7(3), 2196-2212. https://doi.org/10.9770/jesi.2020.7.3(49)

Narayanan, A. et al. (2016). Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press.

Okoli, C., Pawlowski, S.D. (2004). The Delphi method as a research tool: an example, design considerations and applications. Information & Management, 42(1), 15-29. https://doi.org/10.1016/j.im.2003.11.002

Plassaras, N.A. (2013). Regulating digital currencies: bringing Bitcoin within the reach of IMF. Chicago Journal of International Law. 14(1), 377-407. https://chicagounbound.uchicago.edu/cjil/vol14/iss1/12

Pramana, I.G.G.A., Mayangsari, S., Oktris, Lin. (2023). Accounting analysis for crypto-assets based on IFRS. Jurnal Magister Akuntansi Trisakti, 10(1), 19-44. http://dx.doi.org/10.25105/jmat.v10i1.9637

Procházka, D. (2018). Accounting for bitcoin and other cryptocurrencies under IFRS: A comparison and assessment of competing models. The International Journal of Digital Accounting Research. 18, 161-188. https://10.4192/1577-8517-v18_7

PwC. (2018). Cryptocurrencies: Time to consider plan B. Retrieved from https://www.pwc.com/us/en/cfodirect/publications/point-of-view/cryptocurrency-bitcoin-accounting.html

Ram, A.J. (2015). Accounting for the bitcoin: An initial perspective. Master's Dissertation. University of the Witwatersrand. Retrieved from http://hdl.handle.net/10539/20186

Ram, A., Maroun, W., Garnett, R. (2016). Accounting for the Bitcoin: accountability, neoliberalism and a correspondence analysis. Meditari Accountancy Research. 24(1), 2-35. https://doi.org/10.1108/MEDAR-07-2015-0035

Ramassa, P., Leoni, G. (2022). Standard setting in times of technological change: Accounting for cryptocurrency holding. Accounting, Auditing & Accountability Journal. 35(7), 1598-1624. https://doi.org/10.1108/AAAJ-10-2020-4968

Shehada, F., Shehada, M. (2020). The challenges facing IFRS for accounting of cryptocurrencies. In The 1st International Conference on Information Technology & Business. Retrieved from http://dx.doi.org/10.2139/ssrn.3664571

Sheridan, B. (2011). Bitcoins: currency of the geeks. Bloomberg Business Week Retrieved from https://www.bloomberg.com/news/articles/2011-06-16/bitcoins-currency-of-the-geeks

Subačienė, R., Kurauskienė, N. (2020). Evaluation of alternatives of cryptocurrency accounting. Buhalterinės Apskaitos Teorija Ir Praktika. 22(4). https://doi.org/10.15388/batp.2020.26

Teh, S.Y., Yap, A.K.H., Wong, S.C. (2020). Accounting treatment of cryptocurrency: a Malaysian context. Management & Accounting Review. 19(3), 119-149. http://ir.uitm.edu.my/id/eprint/42273

Vieira, S.S. C. (2009). Evaluation of programs of continuing education: analysis perception of students and their model of choice for decision programs of expertise for executives in Brazil. Doctoral Thesis. São Paulo University.

Wright, J.T.C., Giovinazzo, R.A. (2000). Delphi: uma ferramenta de apoio ao planejamento prospectivo. Caderno de Pesquisas em Administração. 1(12), 54-65.

Yermack, D. (2015). Is Bitcoin a real currency? An economic appraisal (chapter 2). Handbook of Digital Currency. Academic Press. https://doi.org/10.1016/B978-0-12-802117-0.00002-3

GCG
The Journal *of* Globalization, Competitiveness, and Governability

El Crecimiento Económico en México Después del SARS COV-2

ÁREA: 1
TIPO: Aplicación

Economic Growth in Mexico After SARS COV-2
Crescimento Econômico no México Após SARS COV-2

AUTORES

Eugenio Guzmán-Soria[1]
Tecnológico Nacional de México en Celaya-Campus II, México.
eugenio.guzman@itcelaya.edu.mx

Samuel Rebollar-Rebollar
Centro Universitario UAEM-Temascaltepec Universidad Autónoma del Estado de México.
samrere@hotmail.com

Juvencio Hernández-Martínez
Centro Universitario UAEM-Texcoco Universidad Autónoma del Estado de México.
jhmartinez1412@gmail.com

Aníbal Terrones-Cordero
Universidad Autónoma del Estado de Hidalgo, México.
anibal_terrones@uaeh.edu.mx

Nicolás Callejas-Juárez
Universidad Autónoma de Chihuahua. México.
ncallejas@uach.mx

1. Autor de contacto: Av. García Cubas 1200, Esquina Ignacio Borunda, Col. Alfredo Vázquez Bonfil, C. P. 38010. Celaya, Guanajuato; México.

Se hizo una proyección del crecimiento económico mexicano ante el SARS COV-2, utilizando una función de producción Cobb-Douglas e información anual de 1980 a 2022. Los resultados de las elasticidades de la mano de obra (0.60) y del capital (0.37) indican que, la economía mexicana tiene una relación muy estrecha con su fuerza laboral. El residuo de Solow (-10.26), que da explicación a los factores que propician el desarrollo económico de una región, derivados del progreso técnico; al ser negativo indica en parte la falta de constancia en la formación bruta de capital en México, lo cual ha repercutido en la tasa de crecimiento, aun cuando el factor laboral se haya mantenido al alza.

A projection of the Mexican economic growth in the face of SARS COV-2 was made, using a Cobb-Douglas production function and annual information from 1980 to 2022. The results of the elasticities of labor (0.60) and capital (0.37) indicate that the Mexican economy has a very close relationship with its labor force. The Solow residual (-10.26), which explains the factors that promote the economic development of a region, derived from technical progress; Being negative indicates in part the lack of consistency in gross capital formation in Mexico, which has had an impact on the growth rate, even when the labor factor has continued to rise.

Foi feita uma projeção do crescimento econômico mexicano frente ao SARS COV-2, usando uma função de produção Cobb-Douglas e informações anuais de 1980 a 2022. Os resultados das elasticidades do trabalho (0,60) e do capital (0,37) indicam que a economia mexicana tem uma relação muito próxima com sua força de trabalho. O resíduo de Solow (-10,26), que explica os fatores que promovem o desenvolvimento econômico de uma região, derivados do progresso técnico; Ser negativo indica, em parte, a falta de consistência da formação bruta de capital no México, que teve impacto sobre a taxa de crescimento, mesmo quando o fator trabalho continuou aumentando.

DOI	Recibido	Aceptado
10.58416/GCG.2024.V18.N1.04	25.07.2023	05.09.2023

GCG
The Journal *of* Globalization, Competitiveness, and Governability

1. Introducción

El crecimiento económico es una combinación de diversos factores que, como se puede observar es medible, compuesto por factores identificables genera beneficios individuales y nacionales, pero a su vez tiene un costo social. Los factores que intervienen en el crecimiento económico de un país son varios y, dependiendo de la teoría o modelo económico utilizado, estos cambiaran al igual que su forma de interacción, los factores más representativos son: trabajo, capital, capital humano, recursos naturales, avances tecnológicos (Irgoin, 2010).

La incertidumbre en el crecimiento económico es la causal de bajas inversiones, retiro de fondos e inestabilidad económica; variables que a su vez generan aumentos en la desocupación laboral, disminución de flujo de efectivo, baja en los niveles de producción y productividad de una región, estancando su desarrollo económico. Esta incertidumbre también ocasiona un aumento en la percepción de riego por parte de los inversores, generando que el flujo de capitales se vea dirigido a tomar opciones con un menor margen de inestabilidad, en los cuales los factores tanto internos como externos no tengan tanta injerencia (Ferrari, 2008).

Entre las principales consecuencias de esta incertidumbre económica está el aumento de la desocupación laboral, actualmente se puede observar como el concepto de empleo estable ha ido cambiando, dejando desprovisto al trabajador de algunos de sus beneficios (entre los cuales destaca el del régimen de pensiones). Este déficit del empleo tiene una repercusión social muy importante, ya que en una sociedad globalizada provista de mercados volátiles el reto principal se vuelve la flexibilidad laboral, fruto de la intermitencia en los ciclos productivos, retirando al trabajador del sentido de pertenencia y dejándolo solo con la capacidad de solventar sus necesidades sociales básicas (Gómez, 2009).

Las variables que han generado la desaceleración de la economía mundial son: la contracción de los mercados europeos, la guerra comercial entre Estados Unidos y China, entre otros. Cabe destacar de manera especial, la emergencia sanitaria consecuencia del SARS Cov-2, la cual toma relevancia debido a su mortalidad, así como al impacto económico mundial que ha representado, afectando directamente a China, país que representa 16% del Producto Interno Bruto (PIB) mundial, disminuyendo su dinamismo financiero, el cual ya manifestaba pronósticos negativos aun sin la presencia de la pandemia. Este escenario global plantea un lento crecimiento en los próximos años parecido al registrado durante la segunda posguerra (Loría, 2020).

El Banco Mundial (2022), señala una caída mundial del PIB en términos porcentuales del 2010 a 2021, de 4.31 a -3.59 (mayor al retroceso de 1.67% registrado durante la crisis económica de 2009), la Unión Europea pasó de 2.21 a -6.2%. Países industrializados registraron una caída significativa, como Alemania de 4.18 a -4.9%, China de 10.64 a 2.3%, Canadá de 3.09 a -5.4%, Estados Unidos de 2.56 a -3.49%, Francia de 1.95 a -8.11%, Italia de 1.71 a -8.87%, India de 8.5 a -7.96%, Holanda de 1.34 a -3.74%, Reino Unido de 2.07 a -9.79%, Rusia de 4.5 a -2.95% y Japón de 4.19 a 0.27%. América Latina y el Caribe pasó de 5.84 a -6.31%, por país Argentina disminuyó de 10.13 a -9.91%, Brasil de 7.53 a -4.06%, Colombia de 4.49 a -6.85%, Chile de 5.84 a -5.77%,

Palabras clave
Crecimiento, Económico, Proyección, México, SARS Cov-2.

Keywords
Growth, Economic, Projection, Mexico, SARS Cov-2

Palavras-chave
Crescimento, Econômico, Projeção, México, SARS Cov-2.

Códigos JEL
B23, C13, C22, C51, E50

Ecuador de 3.53 a -7.75%, México de 5.12 a -8.24%, Paraguay de 11.09 a -1% y Uruguay de 7.8 a -5.86%.

Con respecto al empleo por sector de 2000 a 2020 (en la proporción que guarda con respecto al total de empleos) (Banco Mundial, 2022):

- La industria registró un aumento a nivel mundial pasando de 20.72 a 22.67%, en Estados Unidos cayó de 24.44 a 19.91%, Alemania de 33.53 a 27.18%, Rusia de 29.24 a 26.79%, Francia de 26.27 a 20.43%, Japón de 31.42 a 24.22% y Reino Unido de 25.17 a 18.12%; mientras que China aumentó de 22.5 a 27.42% e India de 16.32 a 25.12%. En América Latina y el Caribe pasó de 21.95 a 20.32%, por país Argentina disminuyó de 22.78 a 21.84%, Brasil de 21.84 a 19.99%, Chile de 23.39 a 22.25%, México de 27.07 a 25.55% y Uruguay de 22.68 a 18.83%; mientras que Colombia aumentó de 18.57 a 20.12% y Paraguay de 16.46 a 18.14%.

- En la agricultura el empleo a nivel mundial, se redujo de 39.91 a 26.76%, en China pasó de 50.01 a 25.33%, Estados Unidos de 1.63 a 1.36%, Alemania de 2.64 a 1.21%, Rusia de 14.49 a 5.83%, Francia 4.14 a 2.53%, Italia 5.23 a 3.89% e India 59.65 a 42.6%. En América Latina y el Caribe pasó de 18.88 a 13.52%, en Argentina de 0.67 a 0.06%, Brasil de 16.49 a 9.08%, Chile de 14.44 a 8.98%, México 17.41 a 12.48% y Paraguay 33.9 a 18.72%.

En México en 2019, las actividades primarias representaron 3.36% (592.3 miles de millones de pesos) del PIB real a precios de 2013. Para 2022, aumentó su participación a 3.65% y los cinco estados con mayor aporte fueron Michoacán (13.5%), Sinaloa (12%), Zacatecas (10.21%), Durango (9.92%), y Chiapas (7.97%). Las actividades secundarias representaron 28.19% (4,778 miles de millones de pesos), lo que equivale a un 0.51% menos que en 2019; por su parte, las industrias manufactureras 15.64% (2,651.18 miles de millones de pesos) y esto representó un 55.48% de las actividades secundarias (0.27% inferior a lo registrado en 2019). Las seis industrias manufactureras con mayor aporte al PIB fueron la industria alimentaria (14.37%); la fabricación de equipo de transporte (10.2%); la fabricación de equipo de computación, comunicación, medición y de otros equipos (4.81%); la industria química (4.58%); la industria de las bebidas y del tabaco (3.39%) y, las industrias metálicas básicas (3.31%) (INEGI, 2021).

Derivado de la pandemia mundial por SARS-COV2, el PIB en México durante el 2020 disminuyó 8.31% con respecto al año anterior, las actividades primarias cayeron un 0.55%, las actividades secundarias -9.94% y las terciarias -7.72%. De las actividades secundarias, la minería registro un retroceso de 1.1%, la generación, transmisión y distribución de energía eléctrica -5.29%, el sector de la construcción -17.43% y las industrias manufactureras -9.85%. Con respecto a las industrias manufactureras, las seis que más retrocedieron fueron la fabricación de embarcaciones con 53.82%, la fabricación de equipo ferroviario 42.15%, la fabricación de calzado 36.34%, la fabricación de prendas de vestir de tejido de punto 35.66%, la confección de prendas de vestir 34.51 y la fabricación de maquinaria y equipo para la industria metalmecánica 33.02%; mientras que las que registraron un aumento fueron la elaboración de alimentos para animales 3.65%, la fabricación de laminados y aglutinados de madera 6.6%, la fabricación de cal, yeso y productos de yeso 7.22%, la fabricación de herramientas de mano sin motor y utensilios de cocina metálicos 6.54%, la fabricación de instrumentos de medición, control, navegación, y equipo médico electrónico 14.62% y la fabricación de equipo de generación y distribución de energía eléctrica 6.13% (INEGI, 2021).

Con base en Briones et al. (2018), Bellod (2011), Acevedo (2009) y en cuanto a las estadísticas de las variables involucradas en este estudio de 1980 a 2022, la media del PIB real de México y la Formación Bruta de Capital Fijo (FBCF) en miles de dólares fue de 12,080,622 y 9,516,483, con un rango de

11,119,938 y 11,682,596, respectivamente. La Población Económicamente Activa (PEA) que representa el número de personas empleadas en el país en la economía formal, registró una media de 39,655,127 y un rango de 30,532,497. El 25% de datos del PIB, la PEA y la FBCF es igual o inferior a 8,598,276; 31,866,584 y 6,200,803, mientras que el 75% es igual o inferior a 14,639.277; 46630254 y 13220678, respectivamente. Para el PIB y la PEA, al ser positivos sus coeficientes de asimetría (0.27 y 0.04), implica que la distribución de sus datos se concentra hacia la izquierda; no así para la FBCF que al resultar negativo (-0.02) indica que los datos se concentran a la derecha. La curtosis al ser negativa para el PIB, la PEA y la FBCF indica que la forma en cómo se concentran sus valores es platicúrtica (**Tabla 1**).

Tabla 1. - México: Estadísticas de PIB, PEA y FBCF, 1980-2022

	PIB	*PEA*	*FBCF*
Media	12080622	39655127	9516483
Desv.Est.	3428650	8902088	3749440
Varianza	1.18E+13	7.92E+13	1.41E+13
Mínimo	7357316	24819807	3370935
Q1	8598276	31866584	6200803
Mediana	12379673	40236365	9762593
Q3	14639277	46630254	13220678
Máximo	18477254	55352304	15053531
Rango	11119938	30532497	11682596
Asimetría	0.27	0.04	-0.02
Curtosis	-1.18	-1.08	-1.31

Fuente: Elaboración propia con información de INEGI-BIE (2023).

La marcada desaceleración económica mundial ha repercutido de una manera directa en México, disminuyendo las expectativas de crecimiento nacional, el crecimiento del Producto Interno Bruto (PIB) cerró en 2020 en -3.27% a nivel mundial, la cifra de cierre de México fue de -8.17% (Banco Mundial, 2022). Panorama que complementa lo registrado en los últimos años, dentro de los indicadores económicos nacionales, los cuales sufrirán movimiento debido a la emergencia sanitaria derivada del SARS COV-2. La población económicamente activa mostró una disminución en junio de 2020, incrementando el desempleo en 5.5%, poniendo en riesgo más de 24 millones de empleos equivalente al 44% del empleo total en México (OIT, 2020).

Lo anterior resalta la importancia del objetivo de este trabajo que fue el analizar y proyectar el crecimiento económico de México, mediante las variables fuerza laboral y capital, para el periodo 2020-2030.

2. Marco Teóricos

Alrededor del mundo, diversas investigaciones han abordado diferentes aspectos del crecimiento económico en países o regiones y, documentan la importancia del tema durante y posterior a la pandemia. Algunos trabajos recientes que vale la pena resaltar son:

Molleví, Álvarez y Nicolas (2023) señalan que la pandemia ha provocado una evolución en el uso empresarial del Big Data, la Inteligencia Artificial (IA) y las Nuevas Tecnologías en general, lo que ha repercutido en el comportamiento y evolución de los sectores económicos. Al analizar cómo este proceso se desarrolló durante la pandemia en el uso y estandarización de Big Data, la digitalización, el uso de datos en el sector privado y en la administración pública; evalúan si estas herramientas se han utilizado para modernizar y digitalizar la sociedad postpandemia. Encontrando que: 1) el impacto de las nuevas tecnologías y la digitalización en la sociedad durante el confinamiento fue positivo y permitieron que se produjera cierta normalidad; 2) el Big Data y la IA pueden ayudar a la toma de decisiones, especialmente relacionadas con la salud y la política, lo cual ha influido en la ejecución de acciones económicas y sociales; 3) los organismos públicos y gobiernos (utilizando su potencial como grandes entidades), debe favorecer la implementación de servicios equitativos y accesibles para toda la población en inversión en salud, la educación y las pequeñas empresas, combinando o utilizando la mayoría de aspectos positivos y universales que ofrecen las Tecnologías de la Información y Comunicación y, el Big Data para incentivar el crecimiento económico de los países.

Mirabelli, Nicoletti, Padovano, Solina, Manfredi y Nervoso (2023) realizaron una revisión de la literatura investigativa del papel que la Industria 4.0 y las herramientas de simulación han tenido a la hora de hacer frente a los efectos de la crisis pandémica. Señalan que la pandemia al ser un evento inesperado y disruptivo que afectó significativamente el desempeño de los sistemas de manufactura y las cadenas de suministro en varios sectores económicos. El análisis, realizado en documentos críticos que se refieren a estudios de casos reales, muestra que hasta ahora la simulación proporcionó apoyo en cuatro principales áreas: consumo de energía, cadena de suministro de atención médica y rastreo de contactos, cadena de suministro de alimentos y, en general, gestión de la cadena de suministro en la mayoría de los giros industriales. El principal resultado de este trabajo de investigación es que las tecnologías de Industria 4.0, los modelos de simulación y, en general, la gestión de la cadena de suministro; fueron clave para afrontar la pandemia. Y resaltan que, estas herramientas, merecen y deben ser explotadas en el futuro próximo con miras a que la producción y el consumo global se recupere, en el mediano plazo, del fuerte impacto negativo generado por la pandemia.

En el crecimiento económico de los países las micro y pequeñas son esenciales, Valdez, Castillo y Ramos (2022), analizaron los efectos de la estrategia financiera y de mercado empresarial y, la gestión de la innovación (el comercio electrónico y el trabajo desde casa) ejercida sobre los indicadores económicos y de negocio en 498 micro, pequeñas y medianas empresas (MIPYMES) ubicadas en la región centro y sur del estado de Sonora en México. Los resultados reportan que la estrategia empresarial (financiera y de mercado) no tiene efectos en la gestión de la innovación y en los indicadores económicos de las MIPYMES. Por otro lado, la gestión de la innovación tiene efectos positivos y significativos en los indicadores económicos y de negocio, relacionados con el rendimiento de las MIPYMES. También se revela que los indicadores económicos tienen un efecto positivo y significativo sobre el rendimiento empresarial. Las estrategias de innovación abierta como el comercio electrónico tienen efectos positivos y significativos en la gestión de la innovación y el desempeño corporativo. Del mismo modo, el trabajo desde casa tiene efectos significativos en la gestión de la innovación. Este estudio contribuye al

desarrollo de la teoría del comportamiento competitivo y la teoría de los recursos y capacidades en las MIPYMES, que son un órgano importante en la estructura económica de los países.

En la actualidad los mercados financieros son los más dinámicos a nivel mundial, en parte importante, por el uso en este sector por las Tecnologías de la Información y la Comunicación (TIC´s) y, son un termómetro importante del comportamiento y situación económica de los países y la pandemia ocasionó en ellos una importante volatilidad. Samitas, Kampouris y Polyzos (2022) examinaron el impacto de la pandemia de SARS Cov-2 en 51 mercados bursátiles importantes, tanto emergentes como desarrollados; aislaron países susceptibles a transmisiones de choque y evaluaron países con inmunidad, durante el encierro. Utilizando la dinámica de dependencia y el análisis de redes sobre una base bivariada, para identificar la volatilidad y el riesgo de contagio entre los mercados bursátiles durante la pandemia. Los resultados mostraron evidencia de contagio financiero instantáneo, entre los mercados, como resultado del bloqueo y la propagación de nuevas sepas de SARS Cov-2. La metodología de redes financieras originó información importante para inversores y legisladores al mejorar la selección de cartera, poniendo énfasis en los activos según la centralidad.

Wang y Zhang (2021), indican que China fue la primera economía en mostrar una recuperación tras la desaceleración inducida por el SARS Cov-2 y analizaron cómo está recuperación económica de China después de la pandemia influía en el crecimiento económico y el consumo de energía de otros países. A largo plazo, los efectos indirectos del crecimiento en la economía China tienen un impacto evidente en el crecimiento económico de los países de ingresos medios-altos (0.17%), seguido del crecimiento de los países de ingresos medios-bajos (0.16%) y de los países de ingresos altos (0.15%). Ahora bien, el impacto que, el efecto indirecto del crecimiento económico de China tiene sobre el consumo de energía; es más significativo en países de ingresos altos (de 0.11% a 0.45%), seguido de los países de ingresos medios-altos (de 0.08% a 0.33%) y de los países de ingresos medios-bajos (de 0.02% a 0.05%). Estos resultados indican que los países de ingresos medios-altos son los que más se beneficiarán de la recuperación económica de China después de la pandemia, seguido por los países de ingresos medios-bajos y por último los países de ingresos altos. Y, también, que el efecto indirecto de la recuperación económica de China después del SARS Cov-2, es más evidente en el aumento del consumo de energía en los países de ingresos altos, seguido por los países de ingresos medios.

En México el sector servicios y específicamente el turismo tiene un impacto significativo en el PIB, lo cual se vio reducido de forma importante por el confinamiento global derivado por la pandemia. Clark, Mauck y Pruitt (2021), examinaron los rendimientos anormales diarios de los precios de las acciones de una muestra de 154 empresas de hospitalidad de 23 países diferentes que cotizan en bolsa y que representaban, en el mercado, más de 400 mil millones de dólares de capitalización en el momento en que del SARS Cov-2 fue visto por primera vez por los participantes del mercado de valores como una gran amenaza, posiblemente incluso existencial. Los hallazgos del estudio sugieren que, financieramente, los hoteles se desempeñaron mejor que los restaurantes, que a su vez se desempeñaron mejor que los casinos. Estos hallazgos son consistentes con las recomendaciones médicas sobre la seguridad relativa de varias actividades relacionadas con la hospitalidad y, por lo tanto, también con los principios de eficiencia del mercado financiero en el sector de la hostelería.

Los países del hemisferio norte fueron los más afectados por el SARS Cov-2, incluidos los Estados Unidos y los países europeos. contrariamente al conocimiento común de que las enfermedades infecciosas son más frecuentes en los países de ingresos bajos y medios, esta pandemia parece haber afectado más a los países ricos. Aycock y Chen (2021), cuantificaron la relación entre las infecciones por SARS Cov-2 (casos confirmados durante el 1 de enero y el 31 de mayo de 2020) y los niveles

de crecimiento económico con datos de Estados Unidos y Europa. La tasa de incidencia se estimó utilizando la población total de 2019 y los casos de SARS Cov-2 se asociaron con el PIB de 2019. Los resultados demostraron una correlación positiva entre la incidencia de casos de SARS Cov-2 y el PIB en los Estados Unidos y los 28 países europeos analizados. Los hallazgos del estudio también sugieren un papel potencial del desarrollo económico de alto nivel para facilitar la propagación de enfermedades infecciosas, como son: un sistema de transporte más avanzado, grandes ciudades metropolitanas con alta densidad de población, mejores viajes nacionales e internacionales para negocios, ocio y más actividades grupales.

Nadeem (2020), señala que la literatura reciente informa que los mercados bursátiles de todo el mundo reaccionaron a la pandemia de SARS Cov-2 con rendimientos negativos, sin embargo, esta reacción no fue uniforme en todos los países. En su estudio postula que, la disminución de la incertidumbre a nivel nacional para enfrentar la pandemia, determina qué tan sensibles son sus habitantes al respecto y modera la reacción de los mercados bursátiles ante la pandemia. Usando datos de casos confirmados de SARS Cov-2 y rendimientos bursátiles de 43 países, encontró evidencia sólida de que la disminución en los rendimientos del mercado de valores en respuesta a un aumento del uno por ciento en el crecimiento en casos confirmados, fue más fuerte para los países con mayor aversión a la incertidumbre.

El SARS Cov-2 demostró ser una pandemia capaz de poner a sociedades y economías de rodillas. Leach, MacGregor, Scoones y Wilkinson (2020), señalan que existe una necesidad urgente de examinar porque el SARS Cov-2 se desarrolló de la forma en que lo hizo y considerar las posibilidades de transformaciones posteriores a la pandemia para repensar el desarrollo de manera más amplia. Basándose en más de una década de investigación sobre epidemias, argumentan que los orígenes, el desarrollo y los efectos de esta pandemia requieren un análisis que aborde tanto condiciones político-económicas estructurales junto con procesos mucho menos ordenados, "ingobernables" que reflejan complejidad, incertidumbre, contingencia y especificidad del contexto. Esta dualidad estructural-ingobernable en las condiciones y los procesos de emergencia, progresión e impacto de la pandemia brindan una perspectiva para ver tres desafíos clave: 1) cómo se utilizan los consejos y la evidencia científica en las políticas públicas, cuando las condiciones son rígidas en las relaciones de poder establecidas; 2) cómo funcionan las economías, con la crisis del SARS Cov-2 ha puesto de manifiesto los límites de un modelo convencional de crecimiento económico y 3) cómo las nuevas formas de política pueden convertirse en la base de las relaciones ciudadano-Estado reformadas para confrontar una pandemia, como las que giran en torno a la solidaridad y el cuidado mutuos. Esta pandemia demuestra que la sociedad mundial enfrenta un futuro incierto, donde la anticipación y la resiliencia a los grandes impactos deben convertirse en la problemática central de los estudios y la práctica del desarrollo. Hasta antes del SARS Cov-2 los enfoques dominantes del desarrollo habían sido de arriba hacia abajo, rígido y orientado hacia objetivos económicos estrechamente definidos, el desarrollo posterior a esta pandemia debe tener un conocimiento y una política radicalmente transformadora, igualitaria e inclusiva en su núcleo.

A partir de los trabajos anteriores y para alcanzar el objetivo planteado, se utilizó el modelo empírico utilizado por Briones et al. (2018), Bellod (2011) y Acevedo (2009) estableciendo como variable dependiente el Producto Interno Bruto nacional (Wang y Zhang, 2021; Aycock y Chen, 2021; Clark et al., 2021;) y, como variables independientes: 1) el factor laboral (Molleví et al., 2023; Mirabelli et al., 2023; Leach et al., 2020), usando como variable proxy la Población Económicamente Activa; 2) el factor capital (Valdez et al., 2022; Samitas et al., 2022; Nadeem (2020), a través de la Formación Bruta de Capital Fijo. La hipótesis de investigación fue que: El Producto Interno Bruto de México, muestra una relación positiva con la fuerza laboral y el capital.

3. Metodología

La función de producción Cobb-Douglas representa un método estructural basado en la teoría Keynesiana, este método toma para su análisis las variables de capital, fuerza laboral (nivel potencial de empleo) y el factor total de productividad. Dando como resultado el producto potencial, el cual tiene como limite la tasa de desempleo, el factor de productividad es determinado como una tendencia creciente y la cual refleja la brecha de producción tomando la información de las desviaciones de ésta, tanto inferiores como superiores a su capacidad. Por último, el capital como lo establece la teoría de Solow se mantiene como una constante en el tiempo reflejando el nivel de inversión en un momento determinado (Miller, 2003). Dichos elementos se encuentran representados bajo el modelo Cobb-Douglas: Q, representa el PIB, A, el factor de productividad, L, el factor laboral, K, el factor de capital. Siendo α y β coeficientes de la participación promedio del trabajo y capital, respectivamente (Briones et al., 2018; Bellod, 2011; Acevedo, 2009):

$$Q_t = A L_t^{\alpha} K_t^{\beta} \qquad (01)$$

donde:

Q= Producto Interno Bruto (PIB) nacional: El resultado de esta ecuación representa el producto potencial del territorio observado, este es el resultado de la interacción entre los niveles de trabajo y capital en un periodo de tiempo establecido.

K= Factor de Capital: Esta variable determina el flujo monetario de un territorio, estando limitada por la cantidad existente de inversión y fue estipulada como la Formación Bruta de Capital Fijo (FBCF).

L= Factor Laboral: La fuerza de trabajo que representa, "El nivel potencial del empleo en el momento t", la cual está estipulada por la tendencia de la Población Económicamente Activa (PEA).

A= Factor de Productividad: También conocido como ***tfp*** (*total factor productivity*) o como un residuo en la ley de Solow, esta variable se puede concebir de dos formas, como si fuese una tendencia lineal o como una trayectoria segmentada del error estimado.

α= Corresponde al coeficiente de la participación del trabajo en el ingreso nacional.

β= Corresponde a la participación del capital en la producción del ingreso nacional.

3.1. Datos

El PIB de México, factor dependiente de este modelo y representado por *Q*, se conformó por una muestra temporal de 43 observaciones comprendidas de 1980 a 2022, tomando su valor agregado bruto en millones de pesos a precios constantes; así como también las series de tiempo de las variables independientes como son la PEA representada por *L* y la FBCF bajo el símbolo de *K*, se obtuvieron de INEGI-BIE (2023). Las cifras monetarias fueron transformadas a dólares por practicidad.

A la **ecuación 1**, Briones et al. (2018) proponen que se incluyan los coeficientes de participación, ***q*** que simboliza el PIB real agregado por trabajador ocupado y ***k*** representando el stock de capital bruto por trabajador. También se agregó un auto rezago (Q_{t-1}) con el propósito de reducir o eliminar la autocorrelación (Gujarati y Porter, 2010). Dentro del periodo temporal de estudio se incorporó una variable binaria[2] definida como ***D***01, que denota en el modelo el cambio de economía cerrada a economía abierta en México, el cual ocurrió en 1986, año en el que el país ingreso al Acuerdo General sobre Aranceles y Comercio (GATT, por sus siglas en inglés), hoy Organización Mundial del Comercio (OMC). Por lo tanto, se asignó en formato binario, el valor de cero al periodo comprendido de 1980 a 1985 y uno a el lapso temporal de 1986 a 2022.

Lo anterior reescribe la **ecuación 1** como sigue:

$$Q_t = A\,L_t^{\alpha}\,K_t^{\beta}Q_{t-1}^{\gamma} q\,k\,D01 \qquad (02)$$

Esta ecuación fue linealizada como:

$$lnQ_t = A\,\alpha lnL_t + \beta lnK_t + \gamma lnQ_{t-1} + q\,kD01 \qquad (03)$$

3.2. Estimación

Para la aplicación de este estudio se toman los siguen supuestos, bajo la teoría general de Solow, el factor total de productividad (Acevedo, 2009): 1) Capital (*K*): Se toma como una constante en el tiempo, producto de la inversión total en el periodo estudiado; 2) Fuerza Laboral (*L*): Considerada como la población económicamente activa (PEA) y de la tasa de desempleo que es congruente con la inflación estable (NAIRU) y 3) Factor Total de Productividad (*A*): Determinados los coeficientes de participación del trabajo y capital, el factor total de productividad se puede estimar como una tendencia lineal. Para el procesamiento de los datos y la estimación del modelo fue empleado el programa EViews 10 de IHS Global Inc. (2019).

El Método de Mínimos Cuadrados Ordinarios (MCO), es reconocido dentro del campo económico, por sus propiedades teóricas y prácticas. Entre ellas, ser insesgado y consistente, tener una varianza que es inversamente proporcional a ***n*** y poseer una distribución muestral normal en los casos en que el tamaño de la muestra es grande. Si existen las condiciones idóneas el estimador MCO, llega a ser más eficiente que otros estimadores (Stock & Watson, 2012). Obtenido el producto bruto potencial mediante la función de producción, es posible proyectar su crecimiento observando la interacción de las variables de trabajo y capital, lo que permitirá responder las preguntas de investigación referentes a las variables de crecimiento económico.

4. Análisis de Resultados

A continuación, se presentan y analizan los resultados derivados del modelo empírico puesto a prueba para México, desde el contexto estadístico y su interpretación económica.

4.1. Análisis Estadístico

Se llevaron a cabo cinco propuestas de modelado, permitiendo comparar sus resultados finales, lo que llevo a la selección del modelo 5, en donde sus variables ***A, lnL, lnK, lnQ$_{t-1}$, q, k*** y ***D01*** denotan propiedades estadísticas aceptables, obteniendo resultados superiores a uno en forma absoluta dentro del estadístico ***T*** de cada factor independiente, un valor de 0.999993 para el R^2 ajustado y su comportamiento al ser evaluada mediante el contraste de las pruebas de Breusch-Godfrey, Prueba White y Prueba Jarque-Bera de normalidad de los residuos (**Tabla 2**), exámenes aplicados en la literatura económica.

El estadístico Durbin-Watson aporta el contraste entre, la hipótesis nula y la alternativa que plantea la existencia de problemas de autocorrelación en el modelo (Gujarati y Porter, 2010), en este su valor indica que el modelo no presenta problemas de autocorrelación entre las perturbaciones. El contraste de Breusch-Godfrey, fue utilizado para diferenciar la presencia de problemas de autocorrelación en un modelo de regresión lineal, contemplando los procesos autorregresivos de orden superior a 1 y los procesos de medias móviles de cualquier orden (Stock & Watson, 2012).

La prueba White tuvo por objetivo, demostrar las formas de heterocedasticidad los cuales invalidan los errores estándar comunes de MCO y sus correspondientes estadísticos, mediante la regresión de los residuos cuadráticos de MCO sobre las variables explicativas (Stock & Watson, 2012), para esta ecuación la hipótesis nula no se puede rechazar ya que los resultados son inferiores a su nivel de significancia 0.05.

Jarque-Bera, es un contraste de normalidad utilizado para oponer la hipótesis del origen de los datos de una distribución normal, el cual presenta valores pequeños si la distribución es aproximadamente simétrica y mesocúrtica, aumentando de valor si se presentan desviaciones en la curtosis o asimetrías (Stock & Watson, 2012), en este caso no tenemos evidencia suficiente para rechazar la hipótesis nula, ya que su nivel de significancia es superior a 0.05.

Tabla 2. - Resultados de los modelos de regresión por MCO

Variables independientes	*1*	*2*	*3*	*4*	*5*
A	0.3502 (0.2833)**	-16.1584 (-201.8689)***	-9.6739 (-10.3514)***	-9.6304 (-9.6977)***	-10.2621 (-11.2473)***
lnL_t	0.0969 (0.5476)**	0.9273 (157.5663)***	0.5662 (10.8699)***	0.5635 (10.0673)***	0.6003 (11.6893)***
lnK_t	0.0993 (1.6456)*	-0.0002 (-0.1015)**	0.4009 (6.9451)***	0.4036 (6.5658)***	0.3652 (6.5122)***
lnQ_{t-1}		0.0053 (1.2566)*	0.0011 (0.3839)**	0.0012 (0.3987)**	0.0039 (1.9196)***
q			17.1470 (304.0548)***	17.1508 (273.6120)***	17.1586 (302.8390)***

k				6.9818 (6.5533)***	6.3092 (6.5096)***
D01					0.0011 (1.2975)**
R^2 Ajustado	0.988159	0.999992	0.999997	0.999997	0.999993
F-statistic. [Prob.]	1030.2***	1164225***	2266077***	1830692***	2288590***
Durbin-Watson.	1.584615	1.279365	1.568618	1.568962	2.494780
Test Breusch-Godfrey	0.0011	0.0105	0.0000	0.0000	0.0000
Test White.	0.0027	0.0094	0.0047	0.1094	0.1786
Jarque-Bera.	0.2639	0.7884	0. 4709	0.7093	0.8685

(**p<0.1, *p<0.05, ***p<0.01)

4.2. Análisis Económico

Resultado del análisis de las series de tiempo, se obtuvieron los coeficientes de la función de producción Cobb-Douglas citada en la **ecuación 2** y obtenidos vía el modelo 5:

$$Q_t = A L_t^{\alpha} K_t^{\beta} Q_{t-1}^{\gamma} qk\,D01 = -10.2621\, L_t^{0.6003} K_t^{0.3652} Q_{t-1}^{0.0039} qk\,D01 \qquad (4)$$

Los resultados económicos son:

- *A*: El factor total de productividad en México, muestra un resultado negativo de -10.2621, dato que indica una relación de menor impacto con las contracciones económicas. Tomando esta información y comparándola con los planes de crecimiento económico actuales, se observa como la estrategia nacional es muy arriesgada y depende para su éxito de la constante atracción de capitales extranjeros, ya sea nuevos o la ampliación de los existentes. Analizando el presente de México, el residuo de Solow incrementa su relevancia, ya que puede llegar a tomar en cuenta otras variables, como lo son la desestabilidad política, aumento en la inseguridad, fuga de capitales y la crisis sanitaria consecuencia del SARS COV-2. La pandemia vino entonces a contribuir de forma directa con la desaceleración económica y con el déficit de atracción de inversiones.

- α: El coeficiente obtenido 0.6003, denota la gran contribución de la fuerza laboral en los ingresos nacionales. La PEA es un factor por desarrollar, el cual es necesario dotarlo de mayores herramientas educativas y trabajar en conjunto con todos los sectores involucrados, para incrementar su perspectiva salarial. La PEA ha sido uno de los indicadores, en donde el impacto del coronavirus se pudo sentir con mayor fuerza, cerrando miles de oportunidades laborales, incrementando la desocupación y llevando a más personas al sector informal, escenario poco alentador que hace de mayor importancia un plan de rescate y recuperación económica bien estructurado.

- β: La variable capital tiene como coeficiente de participación 0.3652, indicando el nivel de contribución de este factor en comparativa con el aspecto laboral. En términos de elasticidad económica a nivel estatal el PIB real (Q) se incrementa en 0.3652% ante un aumento de 1% en la formación bruta de capital en México (K). Este resultado, es posible explicarlo con el escenario actual, en donde un gran número de comercios trabajan desde la informalidad, haciendo imposible registrarlos dentro de una formación de capital, esta problemática no es exclusiva de México y vale la pena tomarla

en consideración, para la creación de políticas de desarrollo económico, más aun después de la emergencia sanitaria, en donde la informalidad creció y múltiples comercios formales tuvieron que cerrar; perdiendo con esto su inversión y el patrimonio de muchas familias.

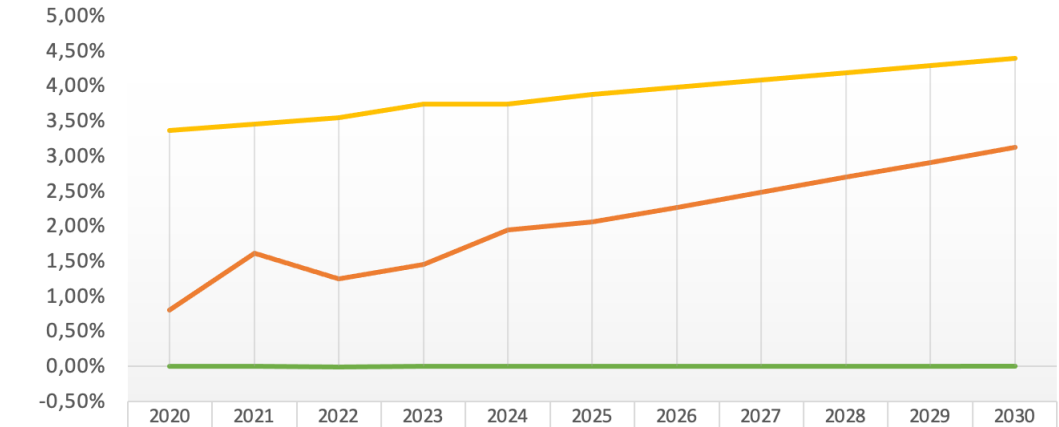
- γ: La variable auto rezagada tuvo como coeficiente de participación 0.0039.

4.3. Proyección del Crecimiento Económico Nacional

Los exponentes de la **ecuación 2**, representan el valor directo de las elasticidades económicas de las variables *L* (α=0.6003) y *K* (β=0.3652), datos que se utilizaron para hacer los pronósticos del PIB (Q) al año 2030. Al igual que en Loría (2020), en este trabajo se plantean dos escenarios macroeconómicos para los pronósticos: 1) neutral y 2) pesimista; considerándose para este último la influencia de factores externos e internos, como son: la guerra comercial entre Estados Unidos y China, la desaceleración de la economía estadounidense, el coronavirus, entre otros.

En el caso de la proyección neutral, se puede observar como la cuenta calculada del PIB, presenta una tendencia a la alza con oscilaciones marcadas en los primeros años de la brecha temporal, así como su inclinación hacia los valores de Q calculada por la elasticidad de L, la cual se muestra de una forma muy constante, al igual que Q obtenida mediante la elasticidad de K, siendo esta última la que denota mayor estacionalidad y un comportamiento símil a la cuenta del PIB, ambas disminuyen o aumenta en los mismos años de forma creciente (**Gráfica 1**).

Gráfica 1. - Proyección del PIB a partir del escenario neutral



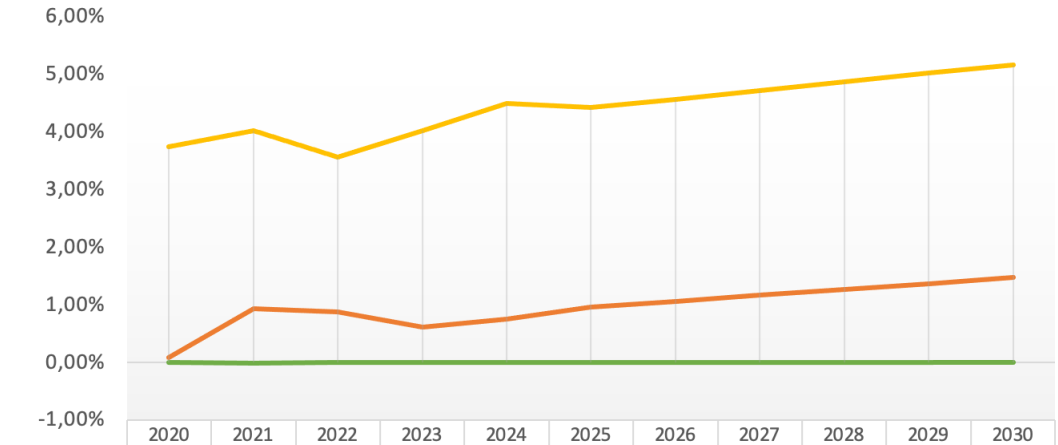
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PIB	0,80%	1,62%	1,25%	1,46%	1,95%	2,06%	2,27%	2,48%	2,70%	2,91%	3,13%
Q de L	3,363%	3,457%	3,550%	3,737%	3,737%	3,877%	3,980%	4,083%	4,186%	4,288%	4,391%
Q de K	-0,00002	0,00018%	-0,00012	0,00027%	0,00045%	0,00046%	0,00056%	0,00067%	0,00077%	0,00087%	0,00098%

Fuente: Elaboración propia a partir de Loría, 2020

Para el segundo escenario, en donde se trabaja una estimación marcada por Loría (2020), como una visión desalentadora, es posible apreciar una línea de PIB mucho más estacionaria y con un comportamiento

paralelo, a los datos calculados por las elasticidades de *L* y *K*, todos estos segmentos se presentan de forma ascendente, pero manteniendo una conducta muy cautelosa (**Gráfica 2**).

Gráfica 2. - Proyección del PIB a partir del escenario pesimista



	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PIB	0,08%	0,93%	0,87%	0,61%	0,75%	0,95%	1,06%	1,16%	1,26%	1,36%	1,46%
Q de L	3,737%	4,017%	3,550%	4,017%	4,485%	4,410%	4,559%	4,709%	4,858%	5,008%	5,157%
Q de K	-0,00007	-0,00030	-0,00008	0,00013%	0,00018%	0,00025%	0,00035%	0,00044%	0,00053%	0,00063%	0,00072%

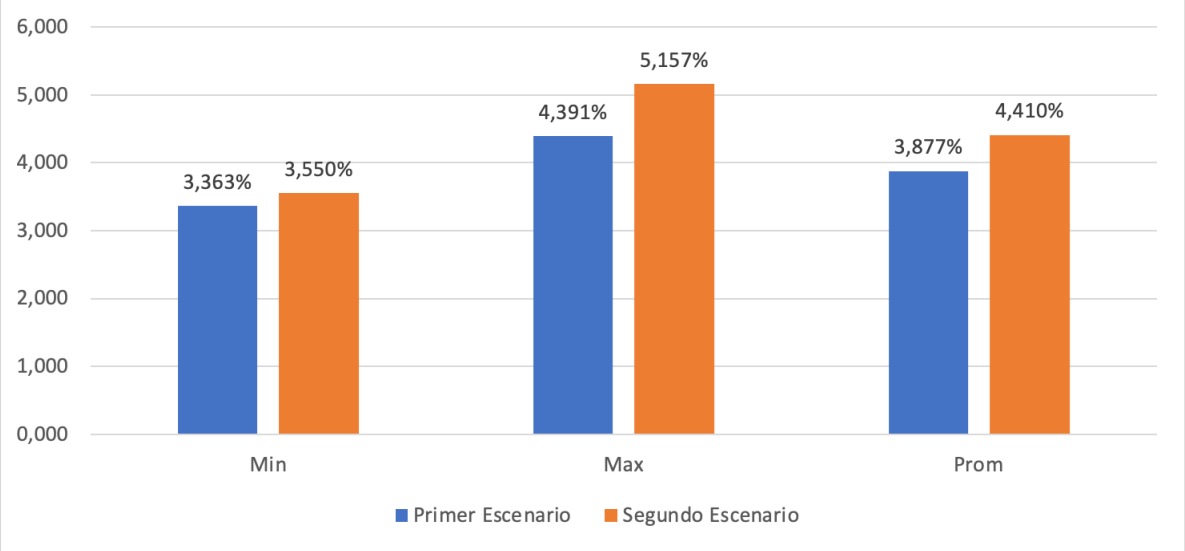
Fuente: Elaboración propia a partir de Loría, 2020

Tomando las series de datos de las cuentas nacionales proyectadas por Loría (2020), se pudo determinar mediante una aproximación, utilizando los porcentajes de participación nacional a fin de obtener la ecuación que permitiera integrar el periodo de tiempo que se fijó como objetivo de la investigación.

El crecimiento del PIB mexicano, en el periodo 2020-2030, mantiene una tendencia creciente con ligeras oscilaciones, las cuales marcan retrocesos en el incremento del PIB nacional, dentro de los primeros años del periodo estudiado; esto debido principalmente a la situación coyuntural ocasionado por el SARS-CoV-2.

A partir de los resultados obtenidos a través de la elasticidad de la variable *L* (**Gráfica 3**), fue posible identificar un crecimiento promedio de 3.877% en el primer escenario, con un mínimo registrado de 3.363% y máximo en 4.391%, mientras que en el segundo panorama registró 4.410% como incremento promedio, colocando su mínimo en 3.550% y su punto máximo en 5.157%. Estas proyecciones, hacen suponer que México se vería beneficiado con la guerra comercial entre Estados Unidos y China, en el largo plazo.

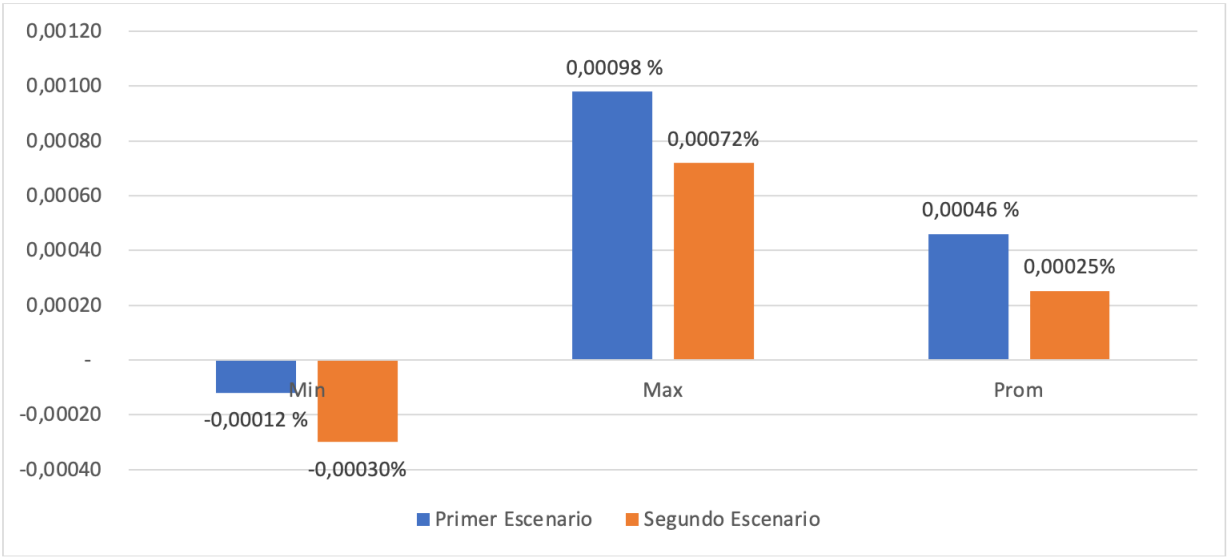
Gráfica 3. - Proyección usando la elasticidad de L, 2020-2030



Fuente: Elaboración propia

A su vez mediante el uso de la elasticidad económica de *K* (**Gráfica 4**), se aprecia un comportamiento en el primer escenario de 0.00046% como valor promedio, ubicando su mínimo y máximo en -0.00012% y 0.00098% respectivamente; por último, para el segundo caso el promedio arrojado es de 0.00025%, tocando un mínimo de -0.00030% y un máximo de 0.00072%.

Gráfica 4. - Proyección usando la elasticidad de L, 2020-2030



Fuente: Elaboración propia

Comparando lo antes expuesto con el estudio de Acevedo (2009), se observó una relación en la conducta de los datos proyectos, con lo percibido en una recesión económica, conducta que se caracteriza por el deterioro en el crecimiento económico, seguido de una lenta recuperación. Este panorama cobra sentido, por lo expuesto en múltiples artículos de organismos internacionales, en donde dan como pronóstico mundial un próximo periodo de baja actividad financiera, haciendo una similitud a las conductas financieras presentes en la segunda posguerra.

Como lo expone Acevedo (2009), los periodos de recesión en la economía mexicana tienden a ser largos, haciendo de suma importancia el pronto actuar por parte de las autoridades y todos los actores involucrados en la pronta recuperación económica.

5. Conclusiones

La contingencia sanitaria provocada por el SARS-CoV-2 (Covid-19), tuvo un efecto directo severo, en el crecimiento económico del país, ésta premisa se logra después del análisis realizado, tras efectuar la comparativa de resultados expuestos, por una investigación previa a la emergencia sanitaria fruto del SARS-CoV-2 contra, escenarios planteados dentro un artículo post pandemia, señala el marcado retroceso en la economía nacional (entre 7% y 9%).

Las cifras resultantes del análisis de las series de tiempo del país en esta investigación, muestran la viabilidad de las inversiones económicas, traducidas en expansión de capitales en México, así como la apertura de nuevos desarrollos, que contribuyan con la ocupación laboral y dinamismo financiero del país. Es preciso tener en cuenta que lo aquí expuesto, tiene en sí mismo una naturaleza dinámica, en la cual interfieren múltiples variables, que cambian y se desarrollan todos los días desde la perspectiva política, social, económica e internacional, haciendo que este estudio pueda ser replicado en el futuro, con resultados diferentes a los aquí presentados.

Con relación a la hipótesis ésta se aceptó, sin embargo, por el continuo movimiento bursátil mundial, así como por la recuperación económica que se presenta en la actualidad derivado a la etapa post emergencia sanitaria, es de esperarse un aumento lento en el flujo de capitales extranjeros dentro del territorio nacional, que se consoliden en nuevos proyectos o incrementen los ya existentes.

El actual panorama mundial en materia económica ha sufrido grandes golpes, consecuencia de la inestabilidad de los mercados bursátiles, así como una desaceleración financiera global, que amenaza con una lenta recuperación, marcada por la capacidad de respuesta durante la etapa post pandemia de SARS-CoV-2. Esto ha tenido eco en todos los órdenes de gobierno, demandando por parte de la ciudadanía respuestas agiles a problemas específicos, que mejoren la calidad de vida y atenúen el impacto negativo, generado por la pandemia, sobre las fuentes de ingreso familiares.

Ante esta situación, México debe considerar adecuar estrategias que faciliten y fortalezcan una pronta reactivación económica, fijando objetivos y planes a corto, mediano y largo plazo. Para lo cual se sugiere observar los siguientes puntos:

- *Consolidación de parques industriales, infraestructura y servicios públicos:* Es importante tener en mente que, en los próximos años la atracción de nuevas inversiones podría ser muy lenta, por ello es imperativo reforzar las actuales fuentes de empleo, así como trabajar para mejorar la percepción nacional en infraestructura, seguridad, servicios básicos, entre otros.

- *Actividades económicas primarias:* México ha tenido un retroceso en este sector, sin embargo, con el actual panorama, es importante su recuperación con miras a la sustentabilidad alimentaria, el apoyo a los sectores rurales y el control de los precios sobre los productos de la canasta básica que de aquí emanan.

- *Atención prioritaria a sectores desfavorecidos:* Acción en pro de reforzar la dinámica social y evitar una mayor descomposición de ésta.

Referencias

Acevedo, F.E.; (2009), "PIB potencial y productividad total de los factores: Recesiones y expansiones en México", Economía mexicana. Nueva Época, Vol. 18, Num. 2, pp. 175-219. Disponible en: https://www.revistaeconomiacritica.org/index.php/rec/article/view/543/522 (Consultado 8 Junio 2021).

Aycock, L.; Chen, X. (2021), "Levels of economic development and the spread of coronavirus disease 2019 (COVID-19) in 50 U.S. states and territories and 28 European countries: an association analysis of aggregated data", Global Health Journal, Vol. 5, pp. 24–30. doi: 10.1016/j.glohj.2021.02.006

Banco Mundial, (05 de Noviembre de 2022), "Crecimiento del PIB (% anual)", Obtenido de Banco Mundial: https://datos.bancomundial.org/indicator/NY.GDP.MKTP.KD.ZG

Bellod, R.J.F.; (2011), "La función de producción Cobb–Douglas y la economía española", Revista de Economía Crítica, Vol. 12, pp. 9-38. Disponible en: https://www.revistaeconomiacritica.org/index.php/rec/article/view/543/522 (Consultado 18 Junio 2022).

Briones, M.X.F.; Molero, O.L.E.; Calderon, Z.O.X.; (2018), "La función de producción Cobb-Douglas en el Ecuador", Tendencias, Vol. 19, Num. 2, pp. 45-73. doi: 10.22267/rtend.181902.97

Clark, J.; Mauck, N.; Pruitt, S. W. (2021), "The financial impact of COVID-19: Evidence from an event study of global hospitality firms", Research in International Business and Finance, Vol. 58, pp. 1-13. doi: 10.1016/j.ribaf.2021.101452

Ferrari, C.; (2008), "Tiempos de incertidumbre. Causas y consecuencias de la crisis mundial", Revista de Economia Institucional, Vol. 10, No. 19, 55-78. Disponible en: https://revistas.uexternado.edu.co/index.php/ecoins/article/download/324/305 (Consultado 30 Octubre 2021).

Gómez, J.J.; (2009), "Incertidumbre laboral, Mercado y trayectorias laborales de profesionales de empresas multinacionales", Editorial Bonaventuriana, Cali, Colombia.

Gujarati, D.N.; Porter, C.D.; (2010), "Econometría", McGraw-Hill Interamericana, México.

IHS Global Inc.; (2019), "EViews 10", Campus Drive, Irvine, California, United States.

INEGI; (2021), "México en Cifras". de Instituto Nacional de Estadística y Geografía (INEGI), Disponible en: https://www.inegi.org.mx/app/areasgeograficas/?ag=11 (Consultado 26 Octubre 2021).

INEGI-BIE; (2023), "Instituto Nacional de Estadística y Geografía-Banco de Información Económica. Disponible en: INEGI-BIE: http://en.www.inegi.org.mx/app/indicadores/?tm=0 (Consultado 6 Enero 2023).

Irgoin, C.H.; (2010), "Crecimiento Económico (Modelos del Crecimiento Económico)", Editorial Ciro Tafur Arévalo, Lima-Peru, Disponible en: http://biblioteca.utec.edu.sv/siab/virtual/elibros_internet/55650.pdf (Consultado 22 Noviembre 2022).

Leach, M.; MacGregor, H.; Scoones, I.; Wilkinson, A. (2020), "Post-pandemic transformations: How and why COVID-19 requires us to rethink development", World Development, Vol. 138, pp. 1-11. Doi: 10.1016/j.worlddev.2020.105233

Loría, E.; (2020), "México 2020-2024: dos escenarios macroeconómicos", Revista Mexicana de Economía y Finanzas, Vol. 15 Num. 2, pp. 145-172. doi: 10.21919/remef.v15i2.482

Miller, S.; (2003), "Métodos alternativos para la estimación del PBI potencial: Una aplicación para el caso de Perú", Estudios Económicos, Vol. 10, pp. 1-38.

Mirabelli, G.; Nicoletti, L.; Padovano, A.; Solina, V.; Manfredi, K. A.; Nervoso, A. (2023), "Exploring the role of Industry 4.0 and simulation as a solution to the COVID-19 outbreak: a literature review", Procedia Computer Science, Vol. 217, pp. 1918–1929. doi: 10.1016/j.procs.2022.12.392

Molleví, B. G.; Álvarez, V. J.; Nicolas, S. R. (2023), "Sustainable, technological, and innovative challenges post Covid-19 in health, economy, and education sectors", Technological Forecasting & Social Change, Vol. 190, pp. 1-9. doi: 10.1016/j.techfore.2023.122424

Nadeem, A. B. (2020), "Stock markets' reaction to Covid-19: Moderating role of national culture", Finance Research Letters, Vol. 41, pp. 1-9. doi: 10.1016/j.frl.2020.101857

OIT; (2020), "México y la crisis de la COVID-19 en el mundo del trabajo: respuestas y desafíos", Organización Internacional del Trabajo, Ginebra, Suiza.

Samitas, A.; Kampouris, E.; Polyzo, S. (2022), "Covid-19 pandemic and spillover effects in stock markets: A financial network approach", International Review of Financial Analysis, Vol. 80, pp. 1-14. doi: 10.1016/j.irfa.2021.102005

Stock, J.: Watson, M.; (2012), "Introducción a la Econometría", Pearson Educación S.A., Madrid (España).

Valdez, J. L. E.; Castillo, V. M.; Ramos, E. E. A. (2022), "Innovative Business Strategies in the Face of COVID-19: An Approach to Open Innovation of SMEs in the Sonora Region of Mexico", Journal of Open Innovation: Technology, Market, and Complexity, Vol. 8, Num. 47. doi: 10.3390/joitmc8010047

Wang, Q.; Zhang, F. (2021), "What does the China's economic recovery after COVID-19 pandemic mean for the economic growth and energy consumption of other countries?", Journal of Cleaner Production, Vol. 295, pp. 1-20. doi: 10.1016/j.jclepro.2021.126265

Wooldridge, J.M.; (2010), "Introducción a la econometría. Un enfoque moderno", Cengage Learning, México.

Notas

2. Las variables binarias o "Dummy", son elementos utilizados para incorporar información cualitativa en un análisis de regresión, estimando la diferencia ceteris paribus existente entre dos grupos. Estas herramientas también son útiles al momento de incorporar información ordinal, mediante la definición de un conjunto de variables que simbolicen los valores del factor ordinal, manteniendo una categoría como grupo base (Wooldridge, 2010).

R E V I S T A | J O U R N A L | R E V I S T A
Globalización, Competitividad y Gobernabilidad | Globalization, Competitiveness & Governability | Globalização, Competitividade e Governabilidade

GCG
The Journal *of* Globalization, Competitiveness, and Governability

Connectedness Between Regional Financial Markets: Evidence from Covid-19 and Russia-Ukraine Conflict

AREA: 1
TYPE: Application

Conectividad Entre los Mercados Financieros Regionales: Evidencia del Covid-19 y el Conflicto Rusia-Ucrania
Conectividade Entre os Mercados Financeiros Regionais: Dados da Covid-19 e do Conflito Rússia-Ucrânia

AUTHORS

Erik Muñoz H.[1]
Universidad de Talca, Chile
erik.munoz@utalca.cl

Francisco Gálvez-Gamboa
Universidad Católica del Maule, Chile
fgalvez@ucm.cl

Elmer Sánchez Dávila
Universidad Peruana de Ciencias Aplicadas, Lima, Perú
esanchezd@pucp.pe

1. Corresponding aurhor: Facultad de Economía y Negocios; Universidad de Talca; Avenida Lircay S/N; Talca, Chile. Código postal: 3460000, Chile.

The paper studies the connectedness of seven regional financial markets since 2018 to 2023 through a TVP-VAR model. The time period selected allow us to study the effects of the connectedness before and after international shocks such as the COVID-19 and the Russian-Ukraine war. Results show that these markets are highly connected but results are heterogenous according to the international shock. During the COVID-19 pandemic, the worldwide uncertainty triggered greater interconnectedness; whereas, the war conflict does not have significant implications, but it did increase the sensitivity of regional markets close to the armed conflict. These results are an important tool in risk management and public policy

El trabajo estudia la conectividad de siete mercados financieros regionales desde 2018 hasta 2023 a través de un modelo TVP-VAR. El periodo de tiempo seleccionado nos permite estudiar los efectos de la conectividad antes y después de shocks internacionales como el COVID-19 y la guerra ruso-ucraniana. Los resultados muestran que estos mercados están muy conectados, pero los resultados son heterogéneos según el choque internacional. Durante la pandemia del COVID-19, la incertidumbre mundial provocó una mayor interconexión; mientras que el conflicto bélico no tiene implicaciones significativas, pero sí aumentó la sensibilidad de los mercados regionales cercanos al conflicto armado. Estos resultados constituyen una herramienta importante para la gestión de riesgos y las políticas públicas.

O artigo estuda a conetividade de sete mercados financeiros regionais de 2018 a 2023 através de um modelo TVP-VAR. O período de tempo selecionado permite-nos estudar os efeitos da conetividade antes e depois de choques internacionais como a COVID-19 e a guerra russo-ucraniana. Os resultados mostram que estes mercados estão altamente ligados, mas os resultados são heterogéneos, dependendo do choque internacional. Durante a pandemia de COVID-19, a incerteza global levou a uma maior interligação; enquanto o conflito bélico não tem implicações significativas, mas aumentou a sensibilidade dos mercados regionais próximos do conflito armado. Estes resultados constituem uma ferramenta importante para a gestão do risco e para as políticas públicas.

DOI	Received	Accepted
10.58416/GCG.2024.V18.N1.05	12.08.2023	12.09.2023

GCG
The Journal of Globalization, Competitiveness, and Governability

1. Introduction

In the last five years, humanity has faced two major events that have caused a significant number of global repercussions: the COVID-19 pandemic and the Russian-Ukraine war conflict. Since the beginning of the COVID-19 pandemic in December 2019, financial markets and global health was affected. The effects of the global pandemic on financial and assets markets have been studied from various perspectives; for instance: oil (Chatziantoniou, Gabauer, & Perez de Gracia, 2022), precious metals (Yıldırım, Esen, & Ertuğrul, 2022), financial markets (Muñoz-Henríquez & Gálvez-Gamboa, 2021), exchange rate (Hung & Vinh, 2023), among others.

The Russian-Ukraine war conflict has been less well documented in the literature due to its recent occurrence. Recent works shows that this conflict has had negative effects on commodity market volatility (Fang & Shao, 2022) and on the global food supply chain (Jagtap et al., 2022). (Umar, Polat, Choi, & Teplova, 2022) has shown that Russian bonds are the main transmitters of shocks to international markets during the event. These effects are mainly triggered by Russia's role in the global energy market, the European bond market and the size of its economy.

Both, the COVID-19 pandemic and the Russia-Ukraine war conflict are a challenge for global financial markets due to the connectivity that exists between regional and global markets. An important part of the literature examines the connectivity between financial markets through the Spillover Index developed by Diebold & Yilmaz (2009, 2012, 2014). For example, the study made by (Ben Amar, Bélaïd, Ben Youssef, & Guesmi, 2021) examines the connectivity of regional markets during the COVID-19 period (European, Latin American, North American, Asian, Pacific and Gulf Cooperation Council markets), identifying the reaction of markets to the uncertainty caused by the pandemic and the disconnection of Latin American markets from global financial markets. These results differ from those presented by (Muñoz & Gálvez-Gamboa, 2022) in calculating the frequency-dominated connectivity of Latin American markets with the US market, identifying the short-term spillover effect when studying returns and the long-term spillover effect when analyzing volatilities.

Regarding the war conflict, (Umar et al., 2022) use a TVP-VAR methodology to study the effect of the war conflict; so that, they calculate a measure of dynamic connectivity with the Russian financial market, European financial markets and the global commodities market. They identify that when the conflict occurs the connectivity between the markets changes and the conflict affects the connectivity of the returns (volatility) in the short term (long term). Similarly, (Fang & Shao, 2022) using a spillover measure of volatility risk identify that the war conflict increases the volatility of agricultural, metal, and energy markets, affecting them through financial and economic channels. Other studies, such as that of (Beraich, Amzile, Laamire, Zirari, & Fadali, 2022) show volatility transmission between American, European and Chinese financial markets, demonstrating that volatility increased during the war conflict, but to a lesser extent than during the COVID-19 pandemic. These results are consistent with the findings of (Babar, Ahmad, & Yousaf, 2023) when studying the connectivity between agricultural commodities and emerging stock markets.

Keywords
Regional Financial Markets, TVP-VAR, Connectedness

Palabras Clave
Mercados Financieros Regionales, TVP-VAR, Conectividad.

Palavras-chave
Mercados financeiros regionais, TVP-VAR, conetividade.

JEL Codes
C10, G15

Therefore, considering both international events and the results of different research that identify a spillover effect, we wonder if the connectedness of world markets was equally affected by Covid-19 and the subsequent Russia-Ukraine war. To answer this question, we investigated the connectedness between developed (European, North American and Pacific) and emerging (Asian, GCC, Latin American and European) regional financial markets, calculating a Connectedness Index through a TVP-VAR methodology.

Our work contributes to the literature investigating the connectedness between financial markets before and during periods of turbulence, particularly focusing on the period comprising COVID-19 and the Russia-Ukraine war. Moreover, the paper provides original results that contribute to the debate in two ways. First, by identifying high connectivity between developed and emerging regional markets and how this varies when periods of turbulence are considered. Second, by identifying those regional markets that are transmitters or receivers of connectivity at the aggregate level and at the disaggregated level considering periods of shocks.

The article is structured as follows: Section 2, presents the methodology used, Section 3, shows the estimation results considering the full sample and the sub-samples considering the events. Finally, Section 4 provides the conclusions and implications.

2. Methodology

We use the approach developed by Antonakakis, Chatziantoniou, & Gabauer (2020) as an extension to the Spillover Index proposed by Diebold & Yilmaz (2009, 2012, 2014) to study the connectedness between different markets and/or assets. The authors propose a dynamic connectivity based on time-varying parameters of an autoregressive vector (TVP-VAR). The particularity of this methodology is that it overcomes the arbitrariness of the moving windows of the base model, and thus, it avoids the loss of observations. Thus, a TVP-VAR model with a lag of order one can be defined as follows:

$$x_t = \Phi_t x_{t-1} + \epsilon_t \qquad \epsilon_t \sim N(0, S_t) \qquad (1)$$

$$vec(\Phi_t) = vec(\Phi_{t-1}) + \xi_t \qquad \xi_t \sim N(0, \Xi_t) \qquad (2)$$

Where x_t, ϵ_t and ξ_t y a vector ***(N x 1)***, and S_t, Φ_t and Ξ_t are matrixes of order ***(N x N)***.

The approach of (Diebold & Yilmaz, 2012) uses time-varying parameters of moving average vectors (TVP - VMA) as the generalized forecast error variance decomposition (GFEVD) of (Koop et al., 1996; Pesaran and Shin, 1998). Thus, using Wold's theorem representation is possible to transform the TVP-VAR into a VMA as:

$$x_t = \sum_{i=1}^{p} \Phi_t x_{t-1} + \epsilon_t = \sum_{j=1}^{\infty} A_{jt} \epsilon_{t-j} + \epsilon_t$$

Therefore, the GFEVD could be expressed as:

$$\varnothing_{ij,t}^{g}(J)=\frac{S_{ii,t}^{-1}\sum_{t=1}^{J-1}\left(\rho_i' A_t S_t \rho_j\right)^2}{\sum_{j=1}^{N}\sum_{t=1}^{J-1}\left(\rho_i A_t S_t A_t' \rho_i'\right)} \qquad \tilde{\varnothing}_{ij,t}^{g}(J)=\frac{\varnothing_{ij,t}^{g}(J)}{\sum_{j=1}^{N}\varnothing_{ij,t}^{g}(J)} \tag{3}$$

Where $\boldsymbol{\rho_t}$ is a vector with a one at position $\boldsymbol{i}$ and zeros at all others positions. By construction $\sum_{j=1}^{N}\tilde{\varnothing}_{ijt}^{N}(J)=1$ and $\sum_{i,j=1}^{N}\sum_{j=1}^{N}\tilde{\varnothing}_{ijt}^{N}(J)=N$. The parameter $\tilde{\varnothing}_{ij,t}^{g}(J)$ represents a directional connectivity loss from market $\boldsymbol{j}$ to market $\boldsymbol{i}$.

Therefore, with the GFEVD it is possible to calculate the connectivity measures proposed by (Diebold & Yılmaz, 2014).

Total Connectedness Index (TCI):

$$C_t(J)=\frac{\sum_{i,j=1,\,j\neq i}^{N}\tilde{\varnothing}_{ij,t}^{N}(J)}{\sum_{i,j=1}^{N}\tilde{\varnothing}_{ij,t}^{N}(J)}*100=\frac{\sum_{i,j=1,\,j\neq i}^{N}\tilde{\varnothing}_{ij,t}^{N}(J)}{N}*100 \tag{4}$$

Total Directional Connectedness to Others (TDCTO):

$$C_{i\rightarrow j,t}(J)=\frac{\sum_{j=1,\,j\neq i}^{N}\tilde{\varnothing}_{ij,t}^{N}(J)}{\sum_{j=1}^{N}\tilde{\varnothing}_{ij,t}^{N}(J)}*100$$

Total Directional Connectedness from Others (TDCFO):

$$C_{i\leftarrow j,t}(J)=\frac{\sum_{j=1,\,j\neq i}^{N}\tilde{\varnothing}_{ij,t}^{N}(J)}{\sum_{i=1}^{N}\tilde{\varnothing}_{ij,t}^{N}(J)}*100$$

Net Total Directional Connectedness (NTDC):

$$C_{i,t}=C_{i\rightarrow j,t}(J)-C_{i\leftarrow j,t}(J)$$

Net Pairwise Directional Connectedness (NPDC):

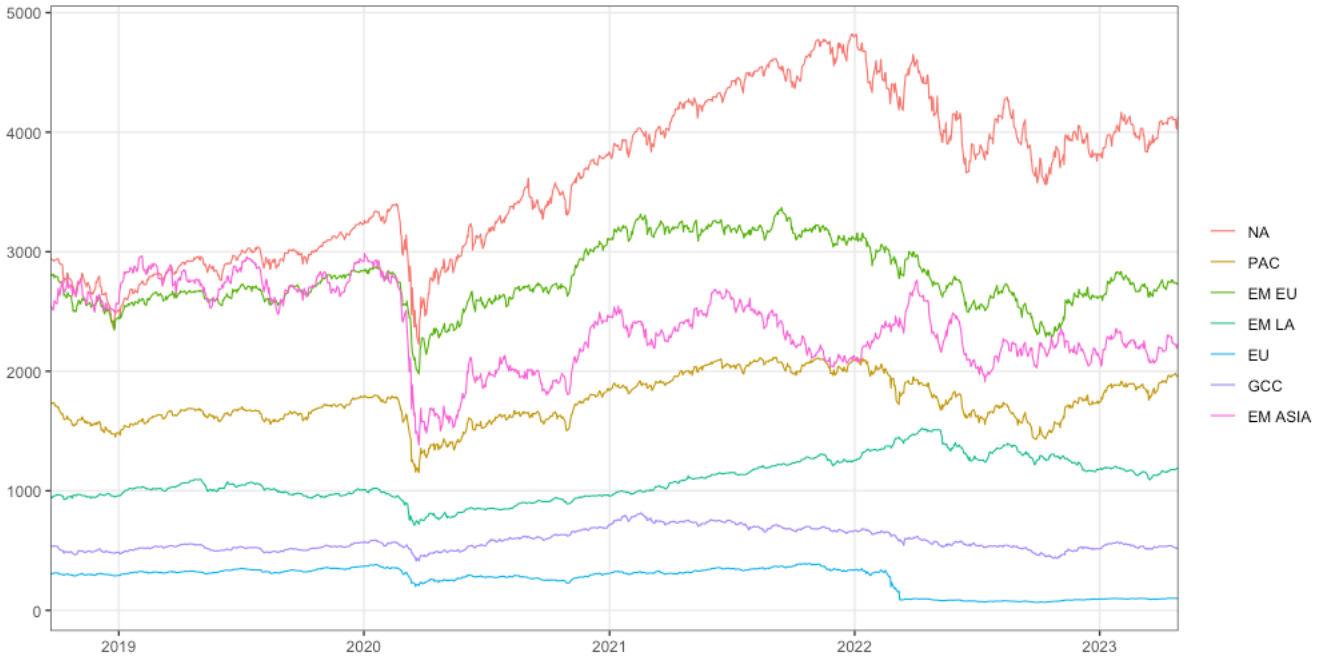
$$NPDC_{i,t}(J)=\left[\tilde{\varnothing}_{ji,t}^{N}(J)-\tilde{\varnothing}_{ij,t}^{N}(J)\right]*100$$

Whether $\boldsymbol{NPDC_{i,t}(J)>0}$ it implies that variable $\boldsymbol{i}$ dominates variable $\boldsymbol{j}$; otherwise, if $\boldsymbol{NPDC_{i,t}(J)<0}$ variable $\boldsymbol{i}$ is dominated by variable $\boldsymbol{j}$.

3. Data

In order to study the connectivity of between financial markets in different regions of the world, we have used the MSCI index developed by MSCI Inc. from 21/09/2018 to 28/04/2023 of the developed markets of Europe (EUR), North America (NA), and emerging markets of the Pacific (PAC), Gulf Cooperation Council (GCC), Latin America (EM LA), Asia (ASIA), Europe (EM EUR). **Figure 1** shows each of the MSCI index series.

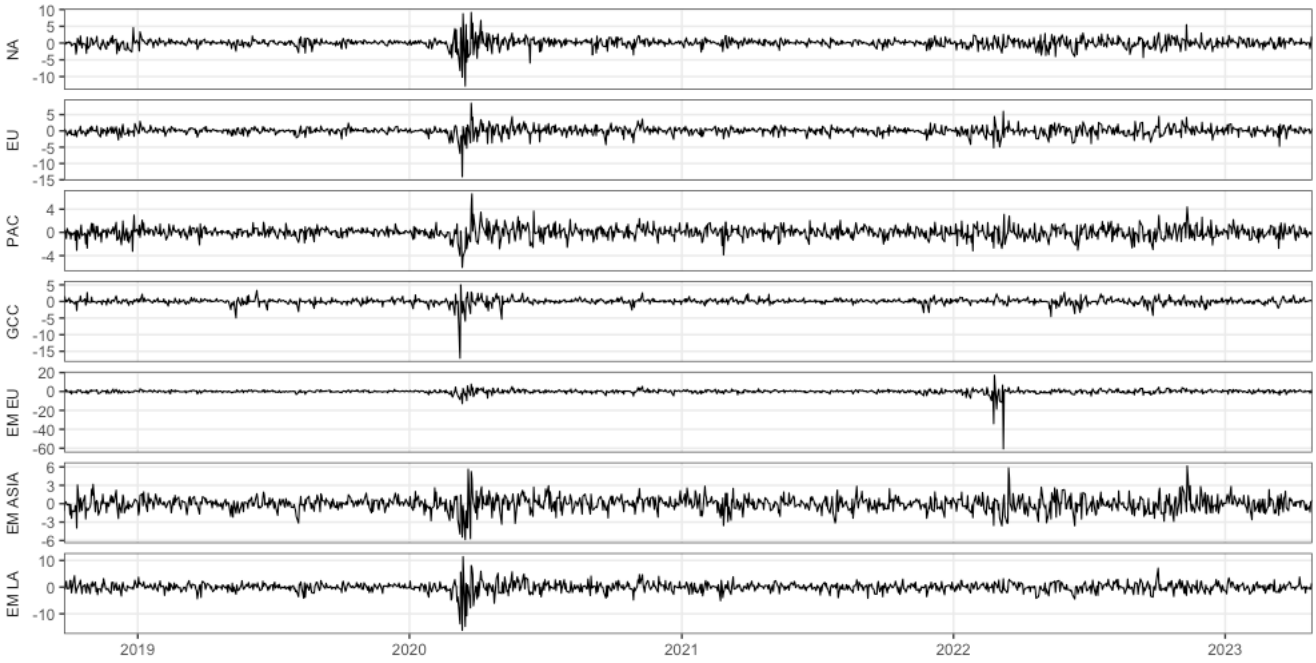
Figure 1. - MSCI Index – Regional Financial Markets



Source: Own elaboration with data obtained from MSCI.com

Considering that the indices exhibit non-stationary behavior, it is necessary to obtain the first logarithmic difference $y_t = ln(x_t) - ln(x_{t-1})$. **Figure 2** shows the returns of each regional market, where at a glance it is possible to identify two important shocks. First, during February 2020 caused by the global COVID-19 pandemic, and second, during February 2022 caused by the armed conflict between Russia and Ukraine.

Figure 2. - Returns MSCI Regional Index



Source: Own elaboration with data obtained from MSCI.COM

Table 1 presents the descriptive statistics of the returns of each regional index, where the kurtosis values and the Jarque-Bera (J-B) test demonstrate the non-normality of the returns, which is a common feature in financial series. In addition, the Phillips-Perron (P-P) test allows us to reject the null hypothesis, which implies stationary returns.

Table 1. - Descriptive Statistics

	Media	*SD*	*Min*	*Max*	*Skewness*	*Curtosis*	*J - B*	*B - P*	*P - P*
NA	0.028	1.397	-12.811	9.127	-0.825	13.164	0.001	0.001	0.01
EUR	0.011	1.299	-14.062	8.524	-1.190	14.806	0.001	0.001	0.01
PAC	-0.002	1.027	-6.031	6.637	-0.061	3.456	0.001	0.001	0.01
GCC	0.019	0.987	-17.057	5.085	-4.963	78.221	0.001	0.001	0.01
EM EUR	-0.093	2.718	-60.688	17.185	-11.191	228.116	0.001	0.001	0.01
ASIA	-0.003	1.196	-5.846	6.157	-0.133	3.180	0.001	0.001	0.01
EM LA	-0.011	1.845	-16.176	11.410	-1.279	13.279	0.001	0.001	0.01

Note: Column J-B and B-P shows the p-values of the Jarque-Bera and Box-Pierce test, respectively with 10 lags. The column P-P, shows the p values of the Phillips-Perron (P-P) test.
Source: Own elaboration with data obtained from MSCI.com

Table 2 shows the unconditional correlations of the returns of each regional index, showing a positive correlation between all markets, which it would explain a homogeneous response to a shock from one

market to the others. The highest correlations are between developed and emerging economies, for instance: NA and EUR with EM LA is 65% and 63.9% respectively. These results suggest a first approach to the possible connectivity between markets.

Table 2. - Correlation between the returns

	NA	*EUR*	*PAC*	*GCC*	*EM EUR*	*ASIA*	*EM LA*
NA	1.000						
EUR	0.608	1.000					
PAC	0.285	0.476	1.000				
GCC	0.279	0.341	0.318	1.000			
EM EUR	0.257	0.429	0.258	0.225	1.000		
ASIA	0.351	0.497	0.614	0.373	0.295	1.000	
EM LA	0.615	0.598	0.351	0.369	0.332	0.422	1.000

Source: Own elaboration with data obtained from MSCI.com

4. Empirical Results

The results of the estimation of connectivity between regional financial markets are shown below. A differentiated analysis is performed for the full period under study and subsamples that identify periods of higher volatility such as covid-19 and the start of the Russia-Ukraine war. Subsequently, a sensitivity analysis estimated through different moving windows is performed.

4.1. Full Sample Analysis

Table 3 presents the directional connectedness full sample, where the inner elements represent the estimated contribution of the variance components to the forecast error variance of the regional market return. In addition, the diagonal elements provide the indirect effects of the returns on their own variables. The results show a total connectedness index of 54.36%, suggesting a high interdependence between regional market returns, which can be interpreted as a high cross-market risk transmission. This index is higher than the findings presented by Ben Amar et al., (2021), which is close to 40%, possibly due to the inclusion of the European emerging markets in the analysis. Our finding implies that on average 54.36% of forecast error variance in these eight markets comes from spillovers and the remaining 45.64% may represent idiosyncratic shocks. However, the directional connectedness to others ( ) has a high variability, ranging from 2.36% (from GCC to PAC) to 19.94% (from NA to PAC).

According to these results, the largest transmitters of return spillover are the developed markets of North America (75.42 - 51.09 = 24.33%) and Europe (81.91 - 61.32 = 20.60%). On the other hand, developed

Pacific countries (39.41 - 66.55 = -27.14%) and GCC countries (18.20 - 37.86 = -19.66) are the largest recipients of return spillover. These results are consistent with those found by Ben Amar et al., (2021).

Table 3. - Directional Connectedness among regional financial markets returns

	NA	*EU*	*PAC*	*GCC*	*EM EU*	*ASIA*	*EM LA*	*FROM*
NA	48.91	17.12	4.75	2.39	8.48	6.81	11.54	51.09
EUR	16.27	38.68	7.03	2.74	16.06	8.35	10.87	61.32
PAC	19.94	15.76	33.45	2.36	9.09	10.45	8.95	66.55
GCC	7.09	6.4	4.41	62.14	7.93	6.16	5.86	37.86
EM EUR	8.59	17.78	5.68	3.77	45.35	7.55	11.29	54.65
ASIA	11.67	12.47	12.03	3.77	9.01	42.5	8.54	57.5
EM LA	11.86	12.39	5.52	3.16	12.01	6.6	48.47	51.53
TO	75.42	81.91	39.41	18.2	62.59	45.91	57.05	380.49
NET	24.33	20.6	-27.14	-19.66	7.95	-11.59	5.52	54.36
NPT	5	6	2	0	4	1	3	

Note: The variance decomposition is based on daily TVP-VAR of lag order 1 with 10-step ahead forecast, chosen according to the Schwartz information criterion.

4.2. Event Analysis

Table 4 shows the estimates considering four sub-samples, considering before and after COVID-19 and the start of the Russia-Ukraine war conflict. Pre-pandemic (24/09/2018 until 31/12/2019), during COVID-19 (01/01/2020 until 31/03/2020), pre Russia-Ukraine War (01/04/2020 until 23/02/2020) and during the armed conflict (24/02/2022 until 31/04/2023).

Prior to the period before the COVID-19 pandemic (**Table 4a**), a relatively high connectivity between regional markets is identified, 55.7%, similar results to those shown in **Table 3**, highlighting the developed North American and European markets as net transmitters of spillover and the developed Pacific and emerging Asian markets as net receivers. In the case of the Latin American market, the results are similar to those found by Ben Amar et al., (2021) where this regional market shows some disconnection with global financial markets on an aggregate basis.

During the COVID-19 period (**Table 4b**) there is greater connectivity between regional markets, reaching a total connectedness index of 76.32%, which is clearly identifiable in **Figure 3**. An important finding is the change in Latin American emerging markets, where in this period of high global uncertainty they became important transmitters of spillover to regional markets, both developed and emerging.

After COVID-19, we consider the period before the Russia-Ukraine war. **Table 4c** shows the estimates, where total connectivity drops to 54.2%, close to the values found before the pandemic. During this period, developed European markets are the main drivers of volatility, which can be attributed to the public health protection measures determined by the European authorities, generating greater uncertainty in the markets.

In the armed conflict (**Table 4d**), total connectivity drops to 48.84%, although the prominence of regional markets is affected. North American markets go from 7.66% net transmission before the armed conflict to 43.89% net spillover transmission, which can be explained by the US support to Ukraine during the war,

triggering uncertainty in international markets. However, developed and emerging markets increased their net receipt of spillover such as the Asian emerging market from -7.26% to 25.33%. An interesting result is presented in the GCC countries, where similar results are presented before and after the armed conflict.

Table 4. - Directional Connectedness among regional financial markets returns at different events

a) Pre-COVID								
	NA	*EUR*	*PAC*	*GCC*	*EM EUR*	*ASIA*	*EM LA*	*FROM*
NA	45.02	19.12	2.74	3.52	10.46	8.49	10.65	54.98
EUR	18.89	40.46	3.63	3.48	14.62	11.44	7.48	59.54
PAC	26.31	15.55	30.26	2.27	8.85	9.71	7.05	69.74
GCC	8.67	7.02	3.08	60.82	7.34	7.66	5.41	39.18
EM EUR	10.05	15.51	3	6.4	43.03	10.58	11.44	56.97
ASIA	13.25	14.55	11	5.66	10.8	37.77	6.98	62.23
EM LA	13.22	9.04	2.61	3.54	12.96	5.92	52.71	47.29
TO	90.38	80.78	26.06	24.87	65.03	53.81	49.01	389.93
NET	35.4	21.23	-43.69	-14.3	8.06	-8.43	1.72	55.7
NPT	4	6	2	0	5	1	3	
b) Covid period								
	NA	*EUR*	*PAC*	*GCC*	*EM EUR*	*ASIA*	*EM LA*	*FROM*
NA	21.75	16.59	8.64	10.45	13.21	9.69	19.68	78.25
EUR	18.84	20.3	7.48	6.62	17.11	10.33	19.32	79.7
PAC	18.59	15.42	15.03	8.28	13.51	10.63	18.55	84.97
GCC	12.6	11.79	7.88	32.73	11.32	7.58	16.1	67.27
EM EUR	17.58	16.96	6.93	5.93	21.9	9.61	21.09	78.1
ASIA	14.84	12.98	12.14	5.63	13.08	26.69	14.65	73.31
EM LA	18.2	13.86	9.58	8.23	14.04	8.72	27.37	72.63
TO	100.64	87.6	52.66	45.14	82.26	56.56	109.38	534.24
NET	22.39	7.9	-32.31	-22.13	4.16	-16.76	36.75	76.32
NPT	5	3	1	1	4	1	6	
c) Pre-Russian and Ukraine war								
	NA	*EU*	*PAC*	*GCC*	*EM EUR*	*ASIA*	*EM LA*	*FROM*
NA	49.26	15.73	5.89	2.03	8.34	7.02	11.74	50.74
EUR	13.42	36.92	8.75	3.5	17.54	7.48	12.37	63.08
PAC	13.09	15.21	38.71	2.49	10.06	11.83	8.6	61.29
GCC	4.94	6.2	4.68	64.6	9.31	5.08	5.17	35.4
EM EUR	7.41	19.41	6.94	4.36	40.96	7.61	13.3	59.04
ASIA	8.91	9.86	13.89	3.71	8.64	46.4	8.58	53.6
EM LA	10.62	14.44	6.58	3.07	14.27	7.31	43.71	56.29
TO	58.4	80.86	46.73	19.16	68.18	46.33	59.77	379.43
NET	7.66	17.78	-14.55	-16.23	9.14	-7.26	3.47	54.2
NPT	3	6	2	0	5	1	4	

d) Russian and Ukraine war period								
	NA	*EUR*	*PAC*	*GCC*	*EM EUR*	*ASIA*	*EM LA*	*FROM*
NA	55.73	18.23	6.69	1.24	3.33	3.12	11.67	44.27
EUR	19.51	42.65	8.72	1.95	11.8	4.76	10.62	57.35
PAC	24.87	18.04	31.37	1.8	5.58	9.05	9.28	68.63
GCC	8.22	4.96	4.77	67.88	4.87	5.53	3.78	32.12
EM EUR	4.1	15.28	5.87	3.79	62.3	2.77	5.9	37.7
ASIA	18.5	12.8	11.02	3.68	3.73	43.35	6.92	56.65
EM LA	12.96	11.72	7.97	2.79	3.63	6.1	54.83	45.17
TO	88.16	81.02	45.03	15.25	32.94	31.32	48.18	341.9
NET	43.89	23.67	-23.6	-16.87	-4.76	-25.33	3	48.84
NPT	6	5	3	0	2	1	4	

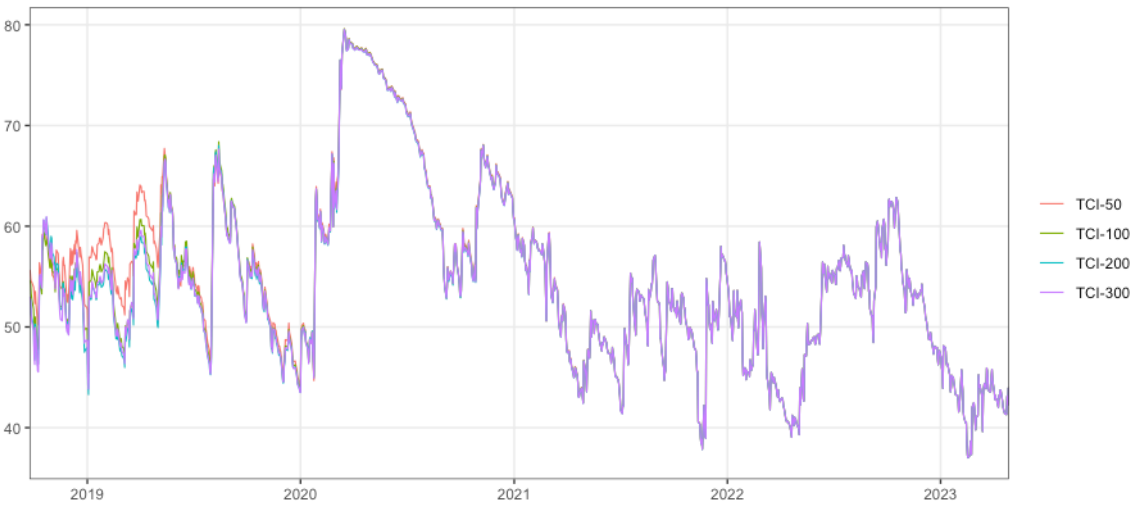
Note: The variance decomposition is based on daily TVP-VAR of lag order 1 with 10-step ahead forecast, chosen according to the Schwartz information criterion

4.3. Sensitivity Analysis

Considering the results above, the connectedness index seems to vary over time. Therefore, **Figure 3** shows the total connectedness index over time, considering different Rolling Windows to check the robustness of the results.

It is possible to identify which prior to the COVID-19 period the use of different Rolling Windows, considering 50, 100, 200 and 300 days in each estimate. Prior to the second quarter of 2019, the use of different Rolling Windows delivered different, although similar, results. On the contrary, since mid-2019, the results are robust independent of the rolling window considered in the analysis.

Figure 3. - Total Connectedness Index (TCI) using different rolling windows



Note: Estimations of the TCI were made using 50,100,200 and 300 days for the Rolling Windows and 10 days ahead for the forecast horizon.

5. Conclusions

This paper investigates the connectivity of regional financial markets (Europe, North America, Pacific countries, Gulf Cooperation Council, Emerging Latin America, Emerging Asia and Emerging Europe) focusing on two recent international events, the COVID-19 pandemic and the Russia-Ukraine war. For this purpose, we use the model developed by (Antonakakis et al., 2020) based on the model of Diebold & Yilmaz (2009, 2012, 2014)

The results show a 54.36% high connectivity between regional financial markets. These results are similar to those found by Ben Amar et al. (2021), which these findings are according with the literature mentioned, where in crisis market connectedness increases.

Then, the sample is divided into four sub-samples, identifying the periods before and after the event (COVID-19 and the Russia-Ukraine war). Prior to the beginning of the pandemic, regional markets presented a connectivity of 55.7%, which increases during COVID-19 to 76.32%, identifying a greater interrelation of markets in this period of high volatility.

Results are different when it comes to analyzing the Russia-Ukraine war, with higher pre-conflict connectivity (54.2%) than during the war (48.84%). This last result seems to be contradictory to what is known in the literature during periods of crisis, but can be attributed to the aggregate data used in the study, as the greatest impact of armed conflict has been documented in the commodity and food markets.

Our findings show that during periods of turbulence, it is necessary to differentiate the extent of the shock. Events such as COVID-19, which wreaked economic, financial and public health havoc worldwide, generate widespread uncertainty in all markets, increasing connectivity and exposing them to greater spillover from global markets. The opposite is the case with armed conflicts where connectivity is relatively unaffected, as it is an event that directly affects some nations and specific markets in which these countries are important.

The results of this study provide important information for policy makers to be cautious about international events and their implications for domestic financial markets. Understanding the dynamic connectedness between international economies allows policy makers to implement actions that ensure the stability of financial systems. For example, by knowing the relationship and impact of an external shock and its determinants, it will be possible for policy makers or regulators to apply corrective or stabilizing actions more effectively.

Other important uses of the results are for investors and portfolio management, re-evaluating investment strategies according to the type of market and international shock. For example, knowing the connectivity between regions will allow investors to pay attention to shocks and their impact on portfolio diversification and hedging strategies, optimizing risk in regions with lower volatility.

A feature of this study is the general analysis at regional level, which is possibly a limitation, but it provides an overview of the behavior of the markets, being possible in future lines of research to extend the results to particular markets and even incorporate proximity or georeferenced variables, particularly because of the results associated with the Russia-Ukraine war.

References

Antonakakis, N., Chatziantoniou, I., & Gabauer, D. (2020). Refined Measures of Dynamic Connectedness based on Time-Varying Parameter Vector Autoregressions. Journal of Risk and Financial Management, 13(4), 84. doi: 10.3390/jrfm13040084

Babar, M., Ahmad, H., & Yousaf, I. (2023). Returns and volatility spillover between agricultural commodities and emerging stock markets: New evidence from COVID-19 and Russian-Ukrainian war. International Journal of Emerging Markets, ahead-of-print(ahead-of-print). doi: 10.1108/IJOEM-02-2022-0226

Ben Amar, A., Bélaïd, F., Ben Youssef, A., & Guesmi, K. (2021). Connectedness among regional financial markets in the context of the COVID-19. Applied Economics Letters, 28(20), 1789-1796. doi: 10.1080/13504851.2020.1854434

Beraich, M., Amzile, K., Laamire, J., Zirari, O., & Fadali, M. A. (2022). Volatility Spillover Effects of the US, European and Chinese Financial Markets in the Context of the Russia–Ukraine Conflict. International Journal of Financial Studies, 10(4), 95. doi: 10.3390/ijfs10040095

Chatziantoniou, I., Gabauer, D., & Perez de Gracia, F. (2022). Tail risk connectedness in the refined petroleum market: A first look at the impact of the COVID-19 pandemic. Energy Economics, 111, 106051. doi: 10.1016/j.eneco.2022.106051

Diebold, F. X., & Yilmaz, K. (2009). Measuring Financial Asset Return and Volatility Spillovers, with Application to Global Equity Markets. The Economic Journal, 119(534), 158-171. doi: 10.1111/j.1468-0297.2008.02208.x

Diebold, F. X., & Yilmaz, K. (2012). Better to give than to receive: Predictive directional measurement of volatility spillovers. International Journal of Forecasting, 28(1), 57-66. doi: 10.1016/j.ijforecast.2011.02.006

Diebold, F. X., & Yılmaz, K. (2014). On the network topology of variance decompositions: Measuring the connectedness of financial firms. Journal of Econometrics, 182(1), 119-134. doi: 10.1016/j.jeconom.2014.04.012

Fang, Y., & Shao, Z. (2022). The Russia-Ukraine conflict and volatility risk of commodity markets. Finance Research Letters, 50, 103264. doi: 10.1016/j.frl.2022.103264

Hung, N. T., & Vinh, V. X. (2023). Asymmetric impact of the COVID-19 pandemic on foreign exchange markets: Evidence from an extreme quantile approach. Economics and Business Letters, 12(1), 20-32. doi: 10.17811/ebl.12.1.2023.20-32

Jagtap, S., Trollman, H., Trollman, F., Garcia-Garcia, G., Parra-López, C., Duong, L., … Afy-Shararah, M. (2022). The Russia-Ukraine Conflict: Its Implications for the Global Food Supply Chains. Foods, 11(14), 2098. doi: 10.3390/foods11142098

Muñoz, E. M., & Gálvez-Gamboa, F. A. (2022). CONECTIVIDAD DE LOS MERCADOS FINANCIEROS LATINOAMERICANOS Y ESTADOUNIDENSE: UN ENFOQUE DE DOMINIO DE FRECUENCIA. Journal of Globalization, Competitiveness and Governability, 16(2). doi: 10.3232/GCG.2022.V16.N2.01

Muñoz-Henríquez, E. M., & Gálvez-Gamboa, F. A. (2021). Efecto contagio del mercado estadounidense a los mercados financieros latinoamericanos durante la pandemia por COVID-19. Cuadernos de Economía, 40(85). doi: 10.15446/cuad.econ.v40n85.93352

Umar, Z., Polat, O., Choi, S.-Y., & Teplova, T. (2022). The impact of the Russia-Ukraine conflict on the connectedness of financial markets. Finance Research Letters, 48, 102976. doi: 10.1016/j.frl.2022.102976

Yıldırım, D. Ç., Esen, Ö., & Ertuğrul, H. M. (2022). Impact of the COVID-19 pandemic on return and risk transmission between oil and precious metals: Evidence from DCC-GARCH model. Resources Policy, 79, 102939. doi: 10.1016/j.resourpol.2022.102939

GCG
The Journal *of* Globalization, Competitiveness, and Governability

AREA: 6
TYPE: Application

Board Diversity and Compliance Practices

Diversidad del Consejo de Administración y Prácticas de Compliance
Diversidade do Conselho de Administração e Práticas de Compliance

AUTHORS

Felipe Arenas-Torres[1]
Centro de Investigación y Estudios Contables
Faculty of Business and Economics
Universidad de Talca, Chile
farenas@utalca.cl

Paz Cabrera-Vargas
Centro de Investigación y Estudios Contables
Faculty of Business and Economics
Universidad de Talca, Chile
pazignaciacabreravargas@gmail.com

Michel Zamorano-Labra
Centro de Investigación y Estudios Contables
Faculty of Business and Economics
Universidad de Talca, Chile
michel.zamoranol@hotmail.com

1. Corresponding author: Universidad de Talca, Faculty of Business and Economics, Centro de Investigación y Estudios Contables. Avenida Lircay s/n, Talca, Región del Maule, Chile. Código Postal: 3460000

This study aimed to determine the incidence of diversity the board of directors in implementing compliance practices in Chilean companies. The research considers 1,322 reports on Social Responsibility and Corporate Governance. The results indicate that the degree of compliance practice adoption is partially explained by the diversity in the composition of the boards of directors of Chilean companies. Likewise, it was demonstrated that in Chile, there needs to be more concern on the part of the authorities in implementing practice for the composition of boards and that compliance is a mechanism that is increasingly present in the governance of companies.

Este estudio tuvo como objetivo determinar la incidencia de la diversidad del consejo de administración en la implementación de prácticas de cumplimiento en las empresas chilenas. La investigación consideró 1.322 informes sobre Responsabilidad Social y Gobierno Corporativo. Los resultados indican que el grado de adopción de prácticas de cumplimiento se explica parcialmente por la diversidad en la composición de los directorios de las empresas chilenas. Asimismo, se demostró que en Chile es necesario que haya mayor preocupación por parte de las autoridades en la implementación de prácticas para la composición de los directorios, y que el cumplimiento es un mecanismo cada vez más presente en el gobierno de las empresas.

Este estudo teve como objetivo determinar o impacto da diversidade do Conselho de Administração na implementação de práticas de conformidade em empresas chilenas. A pesquisa considerou 1.322 relatórios sobre Responsabilidade Social Corporativa e Governança Corporativa. Os resultados indicam que o grau de adoção de práticas de conformidade é parcialmente explicado pela diversidade na composição dos conselhos de administração das empresas chilenas. Mostraram também que no Chile há necessidade de maior preocupação por parte das autoridades na implementação de práticas para a composição dos conselhos, e que a conformidade é um mecanismo cada vez mais presente na governança corporativa.

DOI
10.58416/GCG.2024.V18.N1.06

Received
01.08.2023

Accepted
04.09.2023

GCG
The Journal *of* Globalization, Competitiveness, and Governability

1. Introduction

Compliance has been a term with a clear definition of the obligations and procedures companies must carry out (Pascueli & Alcande, 2019). Gaudemet (2016) refers to it as a set of processes to ensure compliance with legal and ethical standards by companies, their leaders, and their employees. Additionally, studies on corporate governance compliance offer a wide range of qualitative and quantitative analyses that reveal the degree, scope, and dynamics of compliance (Okhmatovskiy, 2016; Shrives & Brennan, 2015), which brings with it benefits for those companies that contemplate these policies within their organization, because it implies better institutional performance, better service provision, and a higher standard of security and trust, which in turn generates greater prestige (Bedoya, 2017).

Practices related to compliance are incredibly beneficial, considering that adopting this type of policy positively influences the internal and external perspectives of public or private entities (Bedoya, 2017). For this reason, some describe it as a new global regulatory trend (Requena & Cárdenas, 2016; Michaelis et al., 2023) in the fight against regulatory non-compliance and prevention of criminal offenses.

Another concept that has been little explored in academic research is diversity, which goes beyond gender diversity and includes differences in age, ethnicity, sexuality, religious beliefs, and physical disabilities (Ghauri et al., 2021). Because, in those homogeneous councils, groupthink can be more limited; On the other hand, if there is gender diversity, the debates will be more intense, more profound, and interesting, and with a greater exchange of pluralist ideas (European Commission, 2012).

Studies related to diversity in the board regarding members of the female gender and foreign nationality indicate that these positively impact the organization's socially responsible behavior (Cuadrado et al., 2015). Likewise, Arenas et al. (2021b) point out that gender and nationality diversity encourages the adoption of good corporate governance practices within companies.

Relating this concept to Chilean companies, Arenas et al. (2021a) mention that the incorporation of the concept of gender, nationality, and age diversity on the boards of Chilean companies is insufficient because of the high homogeneity of its members, allowing the creation of a profile of the average Chilean director, which is mainly male, of Chilean nationality and reaches a high age range.
Based on the above, regarding the diversity and compliance variables, this research focuses on answering the following question: What is the incidence of board composition in the implementation of compliance practices in Chilean corporations?.

This situation becomes relevant given that companies with diverse boards of directors are more profitable than companies with non-diverse boards (Al-Rahahleh, 2017). In addition, they must recognize that the existence of diverse perspectives and values that reflect various experiences, skills, and characteristics is a strength that supports sustainable growth (Al-Rahahleh, 2017). Conversely, compliance also leads to better company reputation, better performance, higher return on investment, and higher market valuation (Kaspereit et al., 2015; Pothisarn et al., 2023).

Keywords
Diversity; board; compliance; fraud; corporate governance; crime prevention model.

Palabras clave
Diversidad; consejo de administración; compliance; fraude, gobierno corporativo, modelo de prevención de delito.

Palavras-chave
Diversidade; conselho de administração; conformidade; fraude, governo corporativo, modelo de prevenção de crime.

JEL Codes
G34; G38; L25; M14

However, the objective of this study is to determine the diversity of the administrative council in the implementation of compliance practices in the issuers of publicly offered securities in the Chilean stock market in 2015 - 2021.

2. Compliance and diversity in the board

2.1. What is and what does compliance involve?

Compliance is the set of procedures and good practices organizations adopt to identify and classify the operational and legal risks they face, establishing internal prevention, management, control, and reaction mechanisms against them. Likewise, according to ISO 19,600, "Compliance" results from an organization fulfilling its obligations and becoming sustainable over time, integrating itself into the organization's culture in the behavior and attitude of the people who work for it (International Organization for Standardization, 2014).

Similarly, authors such as Solis (2007) define it as an independent function that, through appropriate policies and procedures, detects and manages the risk of non-compliance with external and internal regulatory obligations of an organization. Therefore, the term "Compliance" can refer, as its name indicates, to the regulatory, internal, and external compliance of companies, where, through the management of corporate strategies, they will allow, among other things, to prevent and avoid conducts criminal activities of organizations.

Compliance programs are a handy preventive tool for companies that want to protect themselves from fraud or other actions that could damage their integrity. In the same way, the Spanish doctrine mentions that although the cost of compliance is high for companies, the cost of non-compliance is even higher (Garat, 2018).

It is worth mentioning that the adoption of codes of good practice has been one of the most influential trends in corporate governance over the last 20 years (Cuomo et al., 2015; Aguilera & Cuervo, 2004) in developed and emerging economies. It brings with it benefits that will have an impact on the positive development of the organization once they are implemented, some of which are: the external image of the company is favored, greater confidence is generated for shareholders, the control environment in the company is collaborating, and legal and ethical practices are promoted in the market (Castagnino, 2019).

Additionally, it should be noted that compliance does not focus solely on financial regulations (Jackman, 2015), but instead focuses on four regulatory areas, namely, anti-corruption, organized crime, competition law (such as information management and data protection), and lobbying. The latter refers to the intervention of an "agent" to manage the interests of its contracting party and is related to compliance because, depending on the legislation of each country and its regulation, it can constitute an illegal and non-transparent act (Bedoya, 2017).

Compliance is currently one of the most innovative and incipient concepts to incorporate into the management strategies and vision of any organization since the obligation that falls on companies to contribute is increasingly clear to the fight against corruption through the adoption of internal mechanisms aimed at preventing or detecting the conduct of its members or linked third parties. For this reason, compliance has ceased to be a voluntary option for many organizations and has become a requirement to be integrated into their strategy and internal structures to comply with legal precepts or to be able to protect themselves in situations that would put the stability and continuity of the organization's activity in serious trouble.

As for Chile, in the corporate sphere, many companies and organizations, given the evolution of the market and its complexity, have seen the need to reinvent themselves or protect themselves against operational and legal risks. The preceding step is to safeguard the responsibility and image of the company, giving rise to a context of trust and stability for current and future investors.

Finally, it is essential to remember that today's corporate compliance standards provide a viable model to limit defamation and protect entities from wrongdoing (Christina & Fort, 2020). Likewise, consider that an effective compliance system throughout the organization allows an entity to demonstrate its commitment to compliance with relevant laws, including legislative requirements, industry codes, organizational standards, good governance standards, corporate best practices, ethics, and community expectations; thus, the opportunity for an organization to be successful and sustainable over time (International Organization for Standardization, 2014).

2.2. Diversity of the board, how is Chile doing?

Diversity is not only correct, but also essential (Servaes et al., 2022); it refers to the human characteristics that distinguish individuals. Therefore, it can be understood as a heterogeneous group of members of various groups with different identities (Gama & Ramos 2020). Diversity has been progressively studied in administrative councils, particularly in terms of gender diversity (Mendoza et al. 2018). However, board heterogeneity should not be limited to gender (Nisiyama & Nakamura 2018). However, it must incorporate multiple diverse characteristics, such as directors' nationality, occupation, age, and ethnicity (Hillman 2015).

However, it must be taken into account that one of the issues most addressed by good governance codes at the international level is the composition and structure of the boards of directors. Different authors affirm that diversity motivates higher profits (Gordini & Rancati, 2017) and improves board independence and efficiency (Terjesen et al., 2016). Similarly, Rodríguez & Venegas (2018) mention that gender diversity leads to more robust business results and reduces risks by assuming better corporate behavior. In parallel, Abdullah (2014) points out that the spirit of diversity contributes to reducing the risk of groupthink by limiting managerial actions.

Regarding the incorporation of gender, nationality, and age diversity in the directories of Chilean companies, it should be noted that this is insufficient because of the high homogeneity of its members (Arenas et al., 2021b). However, the composition of companies' upper management levels is a relevant topic and is highly promoted by international organizations (Ben-Amar et al., 2017; Wang et al., 2016).

For example, studies related to female participation rates in the labor market indicate that, in Chile, between 2018 and 2021, there was a decrease of 3.2%, which can be explained by the health crisis

caused by the coronavirus and the economic recession. However, if we focus more generally on OECD countries, this decrease will only occur by 0.4% (Organization for Economic Cooperation and Development, 2022). On the other hand, Chile has a 14% female presence on its boards. Although it is above the 9% that Mexico showed in 2020, it is well below other developed countries such as the United States (28 %), Spain (29%), the United Kingdom (35%), and especially France (45%). It should be noted that the boards of companies listed on the Chilean stock market have low diversity (Arenas et al., 2021a) in more developed countries, so there is still a long way to go.

Having said the above, diversity in senior positions is always an exciting topic (Kristanti & Iswandi, 2019), because better results can be achieved with a diverse board. However, not only should the gender variable be considered, but the topics of age and nationality should also be evaluated to discuss a diverse board.

In short, diversity within boards of directors is undeniable and offers clear benefits (De Leon, 2008). Therefore, this issue becomes relevant to implementing compliance practices in Chilean companies, considering that diversity is one of the dimensions of social responsibility on which the company is evaluated by its stakeholders (Sila et al., 2016, Kabara et al., 2023). Moreover, compliance also contributes to the socially responsible behavior of organizations (International Organization for Standardization, 2014), a vital resource for attracting investors and boosting economic growth.

3. Methodology

The research was conducted through a mixed approach, which consisted of collecting and analyzing quantitative and qualitative (Hernández et al., 2014). The type of research was descriptive-correlational (Hernández et al., 2014) and to evaluate the relationship between these variables, where the variation in one factor will not necessarily directly influence the other (Bernal, 2010). Regarding the research design, it should be noted that it was longitudinal (Hernández et al., 2014).

The universe of the study was extracted from the issuers of publicly offered securities that the Commission regulates for the Financial Market. Regarding the population, this corresponds to 1339 annual reports, of which, through a non-statistical probabilistic sampling for convenience, a sample of 1322 annual reports from entities that report the level of diversity of their boards of directors and their degree of trust was obtained from the adoption of compliance practices, according to General Regulation No. 386 on Social Responsibility, and No. 385 on Corporate Governance.

The analysis was carried out through multiple linear regressions, where incidence coefficients of the variables were determined: diversity of gender, nationality, and age, and their relationship with the degree of adoption of compliance practices, covering the periods 2015-2021.

Additionally, to more precisely identify the relationship between the variables under study, the economic sector and the Selective Stock Price Index (IPSA) were used as control variables, which allows for measuring the price variations of the largest and most liquid Chilean issuers listed on the Santiago Stock Exchange.

Table 1 presents the variables for the investigation, differentiating between the dependent, independent, and control variables. In addition, the criteria, description of the variables, type of measurement used in each, and references supporting the model are indicated.

Table 1. - Description of variables included in the regression model

Dependent variables			
Variable	*Description*	*Measurement*	*Reference*
Degree of adoption of compliance practices in companies: - Excellent - Well - Acceptable - Scarce - Deficient	Evaluation of the effect of implementing compliance practices.	The results obtained are assigned one of the defined quintiles to create a multinomial variable.	- Bedoya (2017) - Gaudemet (2016) - SVS (2015a)
Independent variables			
Variable	*Description*	*Measurement*	*Reference*
Gender diversity: - Proportion of women in the board	Measurement of the degree of gender diversity in the boards of organizations	$\frac{\text{Number of women on the board}}{\text{Total board members}}$	- Kahloul et al. (2022) - Al-Rahahleh (2017) - Mateos de Cabo (2017)
Nationality diversity: - Proportion of foreign in the board	Measurement of the degree of nationality diversity in the directory of organizations	$\frac{\text{Number of foreigners in the directory}}{\text{Total board members}}$	- Arenas et al. (2021a) - Kristanti and Iswandi (2019) - Ghauri et al. (2021)
Age diversity: - Proportion under 40 years in the board - Proportion older tan 70 years in the board	Measurement of the degree of age diversity in the directory of organizations.	$\frac{(\text{Number directors} \leq 40 \text{ years} + \text{Number directors} > 70 \text{ years})}{\text{Total board members}}$	- Kahloul et al. (2022) - Hillman (2015) - SVS (2015b)
Control variables			
IPSA	Recognize if the company is within the Selective Price Index of Chilean Shares (IPSA)	If it corresponds to a company IPSA = 0; otherwise No IPSA =1	- Grover et al., (2019) - Mendoza et al. (2018).
Economic Sector	Identify to which economic sector the analyzed companies belong	Primary Sector (Extraction); Secondary Sector (Industrial); Tertiary Sector (Services) = 1	- Arenas et al. (2022) - Fernández and Sarria, (2018)

On the other hand, in order to carry out the study, the data of the dependent and independent variables were transformed into a Likert scale. The data was extracted from the corporate governance and social responsibility reports reported to the Chilean regulator, considering practices closely related to compliance and the diversity of the board of directors. Below, in order to determine the incidence of the diversity of the board of directors in the implementation of compliance practices, the following

hypotheses to be evidenced are detailed:

H_1. Gender diversity has a positive and significant impact on the degree of adoption of Compliance practices.

H_2. Nationality diversity has a positive and significant impact on the degree of adoption of Compliance practices.

H_3. Age diversity has a positive and significant impact on the degree of adoption of Compliance practices.

Finally, below is the model with the study variables described in **Table 1**.

$$G° \text{ Adop. Compliance}_{it} = \beta_0 + \beta_1 \text{ Gender Diversity}_{it} + \beta_2 \text{ Nationality Diversity}_{it} + \beta_3 \text{ Age Diversity}_{it} + \beta_4 \text{ IPSA}_{it} + \beta_5 \text{ Economic sector}_{it} + €_{it}$$

Where the hypotheses are validated with the coefficients:

H_1: Gender Diversity; H_2: Nationality Diversity; H_3: Age Diversity

4. Results

The results obtained from the analyses conducted in this study are discussed in the next section.

4.1. Diversity and Compliance: A descriptive analysis

Table 2 presents the descriptive statistics referring to the degree of adoption of compliance practices and the variables of gender, nationality, and age diversity of Chilean public-offering securities issuers. When analyzing the data obtained, it was possible to observe that the adhesion by these companies concerning the practices established in NCG Nº385 related to compliance was, on average, 46.8%, which means that the companies adopted between three to four practices related to the said topic within its corporate governance. At the same time, the above was analyzed on a Likert scale, yielding an average of 2.9, indicating that Chilean societies have an acceptable degree of practice adoption.

Regarding the gender diversity variable, it can be noted that its average was 8.3%, demonstrating that Chilean boards of directors are homogeneous, since the number of men within them reaches an average of 7.1, and that of women is 0.6. Therefore, it is impossible to find a woman within an administrative council. In addition, taking it on a Likert scale resulted in an average of 1.6, which indicates a scarcity of deficient gender diversity within the boards.

Regarding the diversity of nationality, an average of 10.7% was obtained, which reflects a homogeneous composition of the boards since, in general, if there are 6.9 Chilean directors, only 0.8 foreigners will be found, which shows that there is little to poor concern about integrating foreigners into their boards. Finally, on the topic of age diversity, an average of 25.9% was reached, which indicates that in Chilean boards of directors, there is no equity in the distribution of the ages of its members, since out of 5.8 directors who are between 41 and 70 years old, there are only 1.95 who are over 70 or under 40 years of age.

Table 2. - Descriptive Statistics Degree of Adoption of Compliance Practices

Variable N= 1.322	*Mean*	*Min.*	*Max.*
Dependent variables			
Degree of adoption of compliance practices	46.8%	0.0%	100.0%
Independent variables			
Gender			
Degree of gender diversity	8.3%	0.0%	80.0%
No. of male directors	7.1	1.0	39.0
No. of female directors	0.6	0.0	8.0
Nationality			
Degree of nationality diversity	10.7%	0.0%	100.0%
No. of chilean directors	6.9	0.0	38.0
No. of foreign directors	0.8	0.0	9.0
Age			
Degree of age diversity	25.9%	0.0%	100.0%
No. of directors under 30 years of age	0.1	0.0	7.0
No. of directors between 30 and 40 years old	0.5	0.0	6.0
No. of directors between 41 and 50 years old	1.1	0.0	18.0
No. of directors between 51 and 60 years old	2.3	0.0	21.0
No. of directors between 61 and 70 years old	2.4	0.0	11.0
No. of directors over 70 years of age	1.4	0.0	11.0
Likert analysis			
Degree of adoption of compliance practices	2.9	1.0	5.0
Degree of gender diversity	1.6	1.0	5.0
Degree of nationality diversity	1.6	1.0	5.0
Degree of age diversity	2.7	1.0	5.0

4.2. Multiple Regression Analysis

In this section, correlation and multivariate regression analyses were carried out, where the incidence of the independent variables concerning the degree of compliance practice adoption can be identified. **Table 3** shows the correlations between the variables under study. It is worth mentioning that only those statistically significant relationships were considered; that is, those that reached a level of security between 95% (0.05*) and 99% (0.01**).

Table 3. - Correlations Analysis

Variable N= 1.322	*Compliance practices*	*Gender diversity*	*Nationality diversity*	*Age diversity*
Compliance practices	1.000			
Gender diversity	0.116***	1.000		
Nationality diversity	0.079***	0.098***	1.000	
Age diversity	0.260	-0.056**	-0.139***	1.000

Note. Bivariate correlations are significant at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

However, according to what is stated in **Table 4**, it was possible to observe that when applying Fisher's "F" global significance test, a $p \leq 0.05$ was obtained, which means that the variables under study are significant statistics. Regarding the adjusted definition coefficient (R^2 fitted), corresponding to 0.052, it can be noted that the degree of explanation of the model is low and limited since only 5.2% of the degree of adoption of compliance practices can be explained by the variable's diversity of gender, nationality, and age.

Regarding the incidence coefficients, it can be noted that both gender and age diversity were relevant factors that should be considered in the model since they present a level of significance $p \leq 0.05$, exerting an influence of 14.8%, and 6.2%, respectively in the degree of adoption of Compliance practices in Chilean public limited companies. Therefore, H_1 and H_3 are accepted. Regarding H_2, this hypothesis is rejected because the results are inconclusive.

Likewise, when analyzing the control variables, it can be noted that only the effective stock price index (IPSA) is a relevant factor because it is the only one that presents statistical significance. The standard error was 0.327, which was the margin of error in the model equation.

Once the incidence of each variable concerning the degree of adoption of compliance practices was identified, considering the significant control variables and their standard errors, the model equation was created, as shown in **Table 4**.

Table 4. - Multiple Regression Analysis

Variable N= 1.322	*Coefficient*	*Standard error*	*R^2 Fitted*	*Global significance*
(Constant)	2.796***	0.225	0.052	0.000
Gender diversity	0.148***	0.040		
Nationality diversity	0.014	0.035		
Age diversity	0.062**	0.027		
IPSA CV	Yes			
Economic sector CV	No			

Note. The variables are significant at the 0.1 (*), 0.05 (**) and 0.01 (***) levels.

5. Discussion of Results

Based on the results obtained, Chilean companies have little gender diversity on their boards of directors. This is confirmed by Arenas et al. (2022), who point out that stagnation is observed in Chile in terms of the diversity of the board of directors. According to Terjesen et al. (2015), government and political institutions are essential for developing norms to promote gender equality. Furthermore, Al-Rahahleh (2017) notes that one of the reasons for low gender diversity on boards is a lack of awareness of its potential benefits.

Likewise, regarding the nationality variable, a situation similar to the previous topic is presented since, on average, it is not possible to find a foreigner in Chilean companies, thus reflecting the homogenization of the directories, which can be detrimental to the entity. According to Abuhijleh et al. (2020), a greater diversity of nationality in the members of the board of directors has a positive impact on the company's commitment to social responsibility activities.

Concerning the age topic, the boards of Chilean securities issuers are mainly composed of members between the ages of 41 and 70, so there is limited age heterogeneity within the executive committee. According to Arenas et al. (2022), the diversity of Chilean boards is concentrated in the age range 50–70 years. However, this topic is yet to be explored in different investigations of diversity. Therefore, it was not possible to determine trends in this subject.

Now, regarding the level of adoption of compliance practices, this is acceptable among Chilean securities issuers, as pointed out by Pascueli & Alcande (2019), who affirm that compliance functions within companies are of moderate relevance in Chile because it is necessary to strengthen this field according to international trends, where the objective is not only the formal control of legal obligations but also allows the development of operations, decision-making, business management, and the prevention of risks. In addition, compliance programs in Chile have evolved in their treatment and importance, mainly since the enactment of Law No. 20,393 establishes the responsibility of legal persons and their subsequent modifications.

In contrast, Severino & Acuña (2019) mention that low compliance is the cause companies do not have better knowledge of the new actions they must carry out internally, which does not allow the generation of the necessary conditions for compliance with the actions declared in the standard. Bedoya (2017) states that only these preventive mechanisms currently allow companies to position themselves better and guaran-tee transparency in the services provided.

Finally, the variables studied explain only 5.2% of the model. Therefore, the remaining 94.8% is explained by variables that are not considered, which positively and significantly influence gender and age diversity, accepting H_1 and H_3 based on the coefficient of determination (adjusted R^2). The results are inconclusive regarding the diversity of nationality; thus, H_2 is rejected. In this context, Liang et al. (2023) point out that in specific markets, there could be a positive association between compliance and governance, clearly defining the market and industry to be analyzed.

6. Conclusion

According to the results obtained, the degree of compliance practice adoption is acceptable, while the degree of diversity on the board of directors is still insufficient. Additionally, gender and age diversity have a positive and significant impact on the adoption of compliance practices, exerting an influence of 14.8% and 6.2%, thus accepting H1 and H3. Regarding the diversity of the nationality variable, the results were not conclusive; therefore, H2 was rejected.

Additionally, through this research, the need for related regulations to promote diversity in decision-making bodies and strengthen standards of compliance and prevention of economic crimes was evidenced in Chile.

Finally, regarding diversity, future researchs should consider related issues such as ethnicity, religion, or sexual orientation. Similarly, more quantitative research is expected regarding the impact of compliance on different financial variables, such as accountability.

References

Abdullah, S. (2014). "The causes of gender diversity in Malaysian large firms", Journal of Management and Governance, Vol. 18, pp. 1137–1159. doi:10.1007/s10997-013-9279-0.

Abuhijleh, S.; Adib, M.; Sahyouni, A.; Wang, M. & Zaid, M. (2020). "Boardroom nationality and gender diversity: Implications for corporate sustainability performance", Journal of Cleaner Production, Vol. 251, Num. 119652, pp. 1-14. doi:10.1016/J.JCLEPRO.2019.119652.

Aguilera, R. & Cuervo-Cazurra, A. (2004). "Codes of Good Governance Worldwide: What is the Trigger?", Organization Studies, Vol. 25, Num. 3, pp. 415-443. doi:10.1177/0170840604040669.

Al-Rahahleh, A. (2017). "Corporate Governance Quality, Board Gender Diversity and Corporate Dividend Policy: Evidence from Jordan", Australasian Accounting, Business and Finance Journal. Vol. 11, Num. 2, pp. 86–104. doi:10.14453/aabfj.v11i2.6.

Arenas, F.; Bustamante, M.; Santander, V & Severino, P. (2022). "Diversity and Governance: Is There Really Progress?", Sustainability, Vol. 14, Num. 9 pp. 1-14. Doi:10.3390/su14095158.

Arenas, F.; Bustamante, M. & Campos, R. (2021a). "The incidence of the adoption of corporate governance practices in the returns of chilean corporations", The Journal of Globalization, Competitiveness, and Governability, Vol. 15, Num. 3. Doi:10.3232/GCG.2021.V15.N3.04.

Arenas, F.; Bustamante, M. & Campos, R. (2021b). "The influence of board diversity on the adoption of corporate governance practices". Información Tecnológica, Vol. 32, Num. 5, pp. 181–190. Doi:10.4067/S0718-07642021000500181.

Bedoya, B. (2017). "Compliance: its evolution and challenges in Ecuador, where to go?", USFQ Law Review, Vol. 4, Num. 1, pp. 159–183. doi:10.18272/LR.V4I1.993.

Ben-Amar, W.; Chang, M., & McIlkenny, P. (2017). "Board Gender Diversity and Corporate Response to Sustainability Initiatives: Evidence from the Carbon Disclosure Project", Journal of Business Ethics, Vol. 142, Num. 2, pp. 369–383. doi:10.1007/s10551-015-2759-1.

Bernal, C. (2010). "Metodología de la investigación", 3rd ed., Pearson Education, Bogota, Colombia.

Castagnino, D. (2019). "Una aproximación al concepto de Corporate Compliance", Revista Venezolana de Derecho Mercantil, Vol. 3, pp. 97-131. Available online: http://www.ulpiano.org.ve/revistas/bases/artic/texto/RVDM/3/RVDM_2019_3_97-130.pdf.

Christina, A. & Fort, T. (2020). "Finding the fit: Why compliance and ethics programs should seek to match individual and corporate values", Business Horizons, Vol. 63, Num. 4, pp. 451–462. doi:10.1016/J.BUSHOR.2020.03.002.

Cuadrado, B.; García, R. & Martínez, J. (2015). "Effect of the composition of the board of directors on corporate social responsibility". Spanish Accounting Review, Vol. 18, Num. 1, pp. 20–31. doi:10.1016/J.RCSAR.2014.02.003.

Cuomo, F.; Mallin, C. & Zattoni, A. (2015). "Corporate Governance Codes: A Review and Research Agenda". Corporate Governance: An International Review, Vol. 24, Num. 3, pp. 222–241. doi.10.1111/CORG.12148.

De Leon, M. (2008). "Leading Change in Diversity and Cultural Competence", Journal of Professional Nursing, Vol. 24, Num. 3, pp. 167–171. doi:10.1016/j.profnurs.2008.01.005.

European Comission (2012). "Women on Boards: Commission proposes 40% objective". European Comission. Available online: https://ec.europa.eu/commission/presscorner/detail/en/IP_12_1205

Fernández, J. & Sarria, J. (2018). "Impact of corporate social responsibility on value creation from a stakeholder perspective". Sustainability, Vol. 10, Num. 6, pp. 1-10. doi:10.3390/su10062062.

Gama, K. & Ramos, N. (2020). "Diversity and Inclusion: Culture and Perception in Information Technology Companies". Revista Iberoamericana de Tecnologías del Aprendizaje, Vol. 15, Num. 4, pp. 352–361. doi:10.1109/RITA.2020.3033254.

Garat, M. (2018). "The companies compliance: an instrument for the normative fulfillment and a guarantee for the fundamental rights". Revista de la Facultad de Derecho de México, Vol. 68, Num. 271, pp. 555-576. doi:10.22201/FDER.24488933E.2018.271.65375.

Gaudemet, A. (2016). "La compliance: un monde nouveau?: aspects d'une mutation du droit", 1st ed., Editions Panthéon-Assas, Paris, France.

Ghauri, E.; Mansi, M. & Pandey, R. (2021). "Diversity in totality: A study of diversity disclosures by New Zealand stock exchange listed companies". International Journal of Human Resource Management, Vol. 32, Num. 7, pp. 1419–1459. doi.10.1080/09585192.2018.1539862.

Gordini, N. & Rancati, E. (2017). "Gender diversity in the Italian boardroom and firm financial performance". Management Research Review, Vol. 40, Num. 1, pp. 75–94. doi:10.1108/MRR-02-2016-0039.

Grover, P.; Kar, A. & Ilavarasan, V. (2019). "Impact of corporate social responsibility on reputation - insights from tweets on sustainable development goals by CEOs", International Journal of Information Management, Vol. 48, pp. 39-52. doi:10.1016/j.ijinfomgt.2019.01.009.

Hernández, R.; Fernández, C. & Baptista, M. (2014). "Metodología de la Investigación", 6th ed., McGraw-Hill Interamericana, New York, USA.

Hillman, A. (2015). "Board Diversity: Beginning to Unpeel the Onion", Corporate Governance: An International Review, Vol. 23, Num. 2, pp. 104–107. doi.10.1111/CORG.12090.

International Organization for Standardization (2014). "ISO 19600:2014 Compliance management systems — Guidelines". International Organization for Standardization. Available online: https://www.iso.org/obp/ui#iso:std:iso:19600:ed-1:v1:en (accessed on 22 July 2022).

Jackman, D. (2015). "The Compliance Revolution: How Compliance Needs to Change to Survive", 1st ed., Wiley Finance Series.

Kabara, A.; Abdullah, D.; Khatib, S.; Bazhair, A. & Al Amosh, H. (2023). "Moderating Role of Governance Regulatory Compliance on Board Diversity and Voluntary Disclosure of Non-Financial Firms in a Developing Country", Vol. 15, Num. 5, pp. 1-19. doi: 10.3390/su15054527.

Kahloul, I.; Sbai, H. & Grira, J. (2022). "Does Corporate Social Responsibility reporting improve financial performance? The moderating role of board diversity and gender composition", The Quarterly Review of Economics and Finance, Vol. 84, pp. 305–314. doi:10.1016/J.QREF.2022.03.001.

Kaspereit, T.; Lopatta, K. & Onnen, D. (2015). "Shareholder Value Implications of Compliance with the German Corporate Governance Code", Managerial and Decision Economics, Vol. 38, Num. 2, pp. 166–177. doi.10.1002/MDE.2750.

Kristanti, F. & Iswandi, I. (2019). "The Differences of Company's Performance from CEO Diversity", Polish Journal of Management Studies, Vol. 19, Num. 2, pp. 240–249, doi:10.17512/PJMS.2019.19.2.20.

Liang, S.; Lin, H. & Hsiao, H. (2023). "Compliance and governance: evidence from financial institutions in Taiwan", Journal of Financial Regulation and Compliance, Vol. 31, Num. 3, pp. 298-315. doi.10.1108/JFRC-03-2022-0038.

Mateos de Cabo, R. (2017). "Women and corporate leadership: exploring the gender gap at the top", Femeris: Revista Multidisciplinar de Estudios de Género, Vol. 2, Num. 2, pp. 53-80, doi:10.20318/femeris.2017.3758.

Mendoza, D.; Guadalupe, B. & Saavedra, M. (2018). "Gender Diversity on Strategic Positions and the Level of Indebtedness: Evidence from Mexican Listed Companies", Revista Mexicana de Economía y Finanzas Nueva Época, Vol. 13, Num. 4, pp. 631–654, doi:10.21919/remef.v13i4.343.

Michaelis, M.; Mercuri, F.; Schoch, N. & Ollivier, A. (2023). "Compliance Standards in Continental Europe – Same, Same but Different!?", European Journal of Comparative Law and Governance, Vol. 10, Num. 2, pp. 206-222. doi:10.1163/22134514-bja10052.

Nisiyama, E. & Nakamura, W. (2018). "Diversity of the board and capital structure", Revista de Administração de Empresas, Vol. 58, Num. 6, pp. 551–563. doi:10.1590/S0034-759020180604.

Okhmatovskiy, I. (2016). "Self-regulation of corporate governance in Russian firms: translating the national standard into internal policies", Journal of Management & Governance, Vol. 21, Num. 2, pp. 499–532. doi:10.1007/S10997-016-9352-6.

Organization for Economic Cooperation and Development (2022), "Employment : Employment/population ratio, by sex and age group". Available online: https://stats.oecd.org/index.aspx?queryid=54742 (accessed on 22 July 2022).

Pascueli, M. & Alcande, C. (2019). "Estudio: Compliance en las empresas chilenas: conociendo la situación del Compliance en el mercado empresarial chileno", Centro de Derecho Regulatorio y Empresa, Universidad del Desarrollo, Santiago, Chile.

Pothisarn, T.; Chatjuthamard, P.; Jiraporn, P. & Papangkorn, S. (2023). "Sustainability, asset redeployability, and board gender diversity", Corporate Social Responsibility and Environmental Management, Vol. 30, Num. 4, pp. 1738-1752. doi: 10.1002/csr.2450.

Requena, C. & Cárdenas, S. (2016). "Compliance Legal De La Empresa: Una Tendencia Regulatoria Mundial", 1st ed, Thomson Reuters, Benito Juárez, México.

Rodríguez, A. & Venegas, F. (2018). "Liquidity and leverage of commercial banks in Mexico", Análisis Económico, Vol. 27, Num. 66, pp. 73–96. http://analisiseconomico.azc.uam.mx/index.php/rae/article/view/181.

Servaes, S.; Choudhury, P. & Parikh, A. (2022). "What is diversity?", Pediatr Radiology, Vol. 52, Num. 9, pp 1708-1710. doi:10.1007/S00247-022-05356-0.

Severino, P. & Acuña, O. (2019). "Corporate governance: Ranking of chilean companies with greater transaction in the stock exchange", Revista Lasallista de Investigación, Vol. 16, Num. 1, pp. 103–114. doi:10.22507/RLI.V16N1A3.

Shrives, P. & Brennan, N. (2015). "A typology for exploring the quality of explanations for non-compliance with UK corporate governance regulations", The British Accounting Review, Vol. 47, Num. 1, pp. 85–99. doi:10.1016/J.BAR.2014.08.002.

Sila, V.; Gonzalez, A. & Hagendorff, J. (2016). "Women on board: Does boardroom gender diversity affect firm risk?", Journal of Corporate Finance, Vol. 36, pp. 26–53, doi:10.1016/J.JCORPFIN.2015.10.003.

Solis, J. (2007). Compliance o Cumplimiento Normativo, Partida Doble, Vol. 191, pp. 76-83. ISSN 1133-7869.

SVS (June 08, 2015a). "Norma de Carácter General N° 385: Establece normas para la difusión de información respecto de las prácticas de gobierno corporativo adoptados por las sociedades anónimas abiertas". Available online: https://www.cmfchile.cl/normativa/ncg_385_2015.pdf (accessed on 20 July 2022).

SVS (June 08, 2015b). "Norma de Carácter General N° 386: Modifica Norma de Carácter General N°30 de 1989". Available online: https://www.cmfchile.cl/normativa/ncg_386_2015.pdf (accessed on 20 July 2022).

Terjesen, S.; Aguilera, R. & Lorenz, R. 2015. "Legislating a Woman's Seat on the Board: Institutional Factors Driving Gender Quotas for Boards of Directors", Journal of Business Ethics, Vol. 128, Num. 2, pp. 233–251. doi:10.1007/S10551-014-2083-1.

Terjesen, S.; Couto, E. & Francisco, P. (2016). "Does the presence of independent and female directors impact firm performance? A multi-country study of board diversity", Journal of Management and Governance, Vol. 20, pp. 447–483. doi:10.1007/S10997-014-9307-8.

Wang, Q.; Dou, J. & Jia, S. (2016). "A Meta-Analytic Review of Corporate Social Responsibility and Corporate Financial Performance: The Moderating Effect of Contextual Factors". Business & Society, Vol. 55, Num. 8, pp. 1083–1121. doi:10.1177/0007650315584317.