

¹ Lagunda,
Patricia B.
² Oluyinka,
Solomon A.
³ Santos,
Francia R.*
⁴ Cusipag,
Maria N.
⁵ Bernabe,
Maria
Teresa, N.
⁶ Rosuello,
Marie Paul E.

Competitive Index of Municipalities in Bulacan, Philippines: A Framework Towards Sustainable Business Development



Abstract: - The strong impact of the COVID-19 pandemic created challenges for the marginalized and vulnerable sectors. This global phenomenon also brought many problems to enterprises. This study surveyed the business owners and managers whose business operations are registered in Bulacan. The study hypothesizes that the four pillars of sustainable cities and municipalities' competitive index (CMCI) which includes economic dynamism, government efficiency, infrastructure, and resilience showed significant influence on the sustainability of the businesses in Bulacan. Partial least squares structural equation modeling (PLS-SEM) was utilized in analyzing the competitive index of Bulacan Municipalities. Statistical data analysis, performed by bootstrapping of 5,000 to 10,000 samples, reveals that there exist significant relationships among the four pillars of the competitive index toward the sustainability of businesses. Among the four pillars, only government efficiency was found to have an insignificant influence on business sustainability. Implications of this study are crucial for policy making and formulating strategies for the sustainability of business firms. Furthermore, the four-year ranking competitive index of the province in the Philippines confirms the added pillar of innovation towards a model for sustainable business development. Findings of this study can be validated by other scholars involving cities and municipalities in third world countries.

Keywords: competitive index, municipalities, economic dynamism, government efficiency, infrastructure, resilience, innovation, sustainable business development.

Introduction

The unprecedented Covid-19 pandemic has devastated the world's economy and changed the lives of so many people as well as entrepreneurs. This global phenomenon negatively impacted sustainable development goals of countries, regions, and even local government units (LGUs). Recent reports claim that the governments all over the world have been caught unprepared to respond to the emergencies, health risks, and overall impact of the pandemic. World organizations were able to predict that the damaging effects of the world health pandemic would be more intense for businesses and would create more problems for the marginalized and vulnerable sectors. On the brighter side, the literature presents evidence that sustainability efforts through synergized actions of all sectors provide opportunities for enterprises to sustain their businesses and create impact on business performance.

Historically, the Philippine economy is stained by rampant corruption and ineffective regulatory institutions as emphasized in the works of scholars (Unite & Sullivan, 2000; dela Rama, 2012) cited in (Li Liao, Shi, Unite & Sullivan, 2022). Economic activities in the country, according to La Porta et al. (1999) as cited in (Li Liao et al., 2022), revolved around business groups who build and sustain business activities in an uncertain environment. The Philippine economy, albeit still recovering from the pandemic, is said to be one of the most dynamic economies in East Asia and the Pacific (Credit Agricole Group, 2021). The industry and service sectors which are contributing well to the country's gross development product (GDP) were hardly hit by Covid-19 outbreak, and these sectors have been showing gradual and steady recovery respectively. The government's policy reforms and expansionary fiscal program boosted the economic recovery (2021).

¹ School of Graduate Studies, Baliuag University - Bulacan, Philippines, patricia.lagunda@baliuagu.edu.ph

² Department of Marketing and Advertising, RVRCOB, De La Salle University-Manila, Philippines / College of Business Management and Accountancy, De La Salle Araneta University - Malabon City, Philippines, solomon.oluyinka@dlsu.edu.ph

³*Department of Marketing and Advertising, RVRCOB- De La Salle University - Manila, Philippines, francia.santos@dlsu.edu.ph

⁴Institute of Education, Baliwag Polytechnic College-Bulacan, Philippines / College of Education, De La Salle Araneta University-Malabon City, Philippines, mcusipag@btech.ph.education

⁵ College of Hospitality Management and Tourism, Baliuag University - Bulacan, Philippines, mariateresabernabe@baliuagu.edu.ph

⁶ College of Liberal Arts and Education, Baliuag University - Bulacan, Philippines, mariepaulrosuello@baliuagu.edu.ph

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Rankings for the year 2020-2021 of Bulacan's Cities and Municipalities Competitive Index (CMCI) were based on the four convergent pillars, namely: economic dynamism, government efficiency, infrastructure, and resiliency. These four pillars of CMCI are the key strategic components of sustainable cities and municipalities identified by the Department of Trade and Industry (DTI). Bulacan ranked 8th in 2020 rankings of top 10 provinces in the whole Philippines. Although, the overall CMCI score of the province showed an increasing trend from 2015 to 2020 (cmci.dti.gov), and Bulacan slid back to the 10th place in 2021 and 2022 based on the overall score on four pillars: Economic Dynamism, Government Efficiency, Infrastructure, and Resiliency.

The global phenomenon brought about by Covid-19 negatively impacted sustainable development goals of countries, regions, and even local government units (LGUs). Thus, this study aims to analyze the competitive index of LGUs or municipalities in the country. Specifically, it employs the Cities and Municipalities Competitive Index (CMCI) framework which includes economic dynamism, government efficiency, infrastructure, and resiliency of Bulacan municipalities.

The Research Problem

The pandemic was viewed as an opportunity of building a more inclusive society and economy, however, global recovery must be achieved in spite of health risks and overall impact of the pandemic. With the unstoppable effects of pandemic, more marginalized and vulnerable sectors were affected. On the brighter side, the literature shows that sustainability efforts through synergized actions of all sectors provide opportunities for enterprises to sustain their businesses and create impact on business performance.

This paper hypothesizes that the four pillars of sustainable cities and municipalities' competitive index would significantly influence sustainability of business in Bulacan. In addition, this study hypothesizes that *infrastructure* is positively correlated with *economic dynamism*. Furthermore, this paper aims to generate a model of sustainable business development grounded from the SEM analysis.

The target output of this paper focuses on the synergistic sustainable business development programs intended for the sustainability of cities and municipalities across all regions of the country. The study establishes the indispensable role of local competitiveness toward achieving competitiveness at the national level. In addition, it seeks to attain the promotion of regional competitiveness which is more or less a logical consequence.

Review of Related Literature

The literature review focuses on each specific pillar of competitive cities and municipalities index: economic dynamism, government efficiency, infrastructure and resiliency. The literature gave emphasis on competitive and sustainable businesses as the dependent variable of the study. Thus, the frontier of the literature review is all about *competitive cities and municipalities and sustainable businesses*. The key indicators of sustainable cities and municipalities derived from the existing competitiveness indicator systems were used to guide the researchers in forming the framework behind the CMCI (DTI, 2019).

Competitiveness of the cities has essential building blocks *i.e.* the enabling business environments and business dynamics. A good governance system and organizational structures explicate transparent rules for business (ADB, n.d.)

Economic Dynamism

Economic dynamism measures the stable expansion of businesses, industries, and employment of the local government unit (LGU) (CPBRD, 2017). The concept of dynamic economics, the economic variables like consumption function, income, and investment in a dynamic state are being studied (Adda, Cooper, & Cooper, 2003). Boianovsky (2017) supported that economic dynamics is the study of an economy in which rates of output are changing. In the real world, economic variables like population, capital, production techniques, style, habits, and others do not change at a constant rate. The rate of change is different at different times. In a dynamic state, there is uncertainty of every change. Hence, it is not possible to make correct predictions (Kieu, Malleson, & Heppenstall, 2020).

Brock's (2018) study on nonlinearity and complex dynamics stressed *economy* as an evolving complex system in which economic dynamism serves as part of economic theory where all quantities must be dated.

Economic dynamism is linked with business activities that create business and economic production and higher employment. The local municipality serves as the center of economic activities. Thus, this is where business expansion and job creation are easily observed. Specific indicators include the following: (ECO1) Size of the local economy; (ECO2)-Growth of the local economy; (ECO3)-Structure of the local economy; (ECO4) Safety-compliant businesses; (ECO5)-Increase in employment; (ECO6)-Cost of living; (ECO7) Cost of doing business;

(ECO8) Financial deepening; (ECO9) Productivity; and (ECO10) Presence of business and professional organizations (CMCI, 2019).

Government Efficiency

Under the Cities and Municipalities Competitive Index (CMCI) of the Department of Trade and Industry (DTI), *government efficiency* is referred to as the quality and reliability of government services and government support for effective and sustainable productive expansion. At the operational level, this indicator measures the local government unit as an institution that is “generally not corrupt; able to protect and enforce contracts; applies a moderate and reasonable taxation, and is able to regulate proactively” (La Porta et al, 1999).

Government efficiency as defined in the Manual of Operations of CMCI (DTI, 2019) has the following indicators: (GOV1) compliance to national directives; (GOV2) presence of investment promotion unit; (GOV3) business registration efficiency; (GOV4) capacity to generate local resources; (GOV5) capacity of health services; (GOV6) capacity of school services; (GOV7) recognition of performance; (GOV8) compliance to business permit and licensing system standards; (GOV9) peace and order; (GOV10) social protection.

Infrastructure

Infrastructure as a key pillar of competitive and sustainable cities and municipalities makes economic development feasible, creates growth, enhances economic competitiveness, and maximizes comparative advantage when it has a satisfactory provision and administration. (Serebrisky, 2013)

Villamejor-Mendoza (2020) defines *infrastructure* as the physical component that connects, expands, and sustains a locality and its environment to enable the sufficient supply of goods and services. Basically, it involves inputs of production such as water and energy; factors that are interconnected with production such as transportation, roads networks, and communications. As suggested by Serebrisky (2014), the city’s infrastructure serves as an engine for sustainable development. Hence, it is of vital importance to the development of sustainable cities, and proper planning is crucial to the development of sustainable infrastructure such as electricity, water, transportation, and telecommunications networks that are intrinsic to urban life and offer up a powerful and dynamic way of seeing contemporary cities and urban regions (Anand et al., 2018).

The literature confirms positive correlation between growth and investment in infrastructure (Agenor, 2013). For Bennett (2019), investments in infrastructure provide an enabling function which stimulate new business establishments that will cater to visitors and transients. Investment in infrastructure promotes economic growth. This pillar of the municipality's competitive index makes it possible for business and economic productivity to be sustainable over time. It is a physical building block which connects, expands, and sustains the locality and its social environment to provide goods and services to its people. Furthermore, it includes basic inputs for production (energy, water); interconnection of production (transportation, roads, and communications); sustenance of production (wastes, disaster preparedness, environmental sustainability, and human capital formation infrastructure). There are 10 indicators of *sustainable infrastructure* (dti.gov): (INFRA1) Existing Road Distance From City/Municipality Center to Major Ports; (INFRA2) DOT-Accredited Accommodations; (INFRA3) Availability of Basic Utilities; (INFRA4) Annual Investments in Infrastructure; (INFRA5) Connection of ICT; (INFRA6) Number of Public Transportation Vehicles; (INFRA7) Health Infrastructure; (INFRA8) Education Infrastructure; and (INFRA9) Number of Automated Teller Machines.

Resiliency

In 2017, resiliency was added as a new pillar of CMCI which used to have only three indicators of competitiveness index (economic dynamism, government efficiency, and infrastructure). As one of the key pillars of CMCI, resiliency measures the capacity of municipalities in facilitating business and industries’ activities that are essential in the creation of jobs, raising productivity and increasing incomes of people over time amidst shocks and disasters it may encounter (BPCBRD, 2017).

Resiliency is regarded as an essential principle of sustainable design. Adaptation of communities to climate change requires building resilient infrastructures. City/local governments need to consider the adverse effects of climate change for it has implications on disaster risks. Effective transportation system is also needed for adaptive measures. Furthermore, to be adaptive, there should be more resilient design standards and regular maintenance of all infrastructures (Otto-Zimmermann, 2011).

The core elements of resiliency have been linked consistently with its application to disaster risks, local governance and leadership, resources or financing, communication or report, economic investment such as infrastructures, resilience of system or preparedness (Pattel et al., 2017; DTI, 2019). Local communities can build collective resilience through a network of adaptive capacities or resources with dynamic attributes (Norris et al., 2008).

To ensure all of these responsibilities, the local government must be resilient in terms of the four indicators of competitive index (infrastructure, governance, social and environmental systems (cmci.dti.gov). The following resiliency indicators have been utilized in this study: (RES1) Organization and Coordination: Land Use Plan;

(RES2) Organization and Coordination: Disaster Risk Reduction Plan; (RES3) Organization and Coordination: Annual Disaster Drill; (RES4) Organization and Coordination: Early Warning System; (RES5) Resiliency Financing: Budget for DRRMP; (RES 6) Resiliency Reports: Local Risk Assessments; (RES7) Resiliency Infrastructure: Emergency Infrastructure; (RES8) Resiliency Infrastructure: Utilities; (RES9) Resilience of System: Employed Population; and (RES10) Resilience of System: Sanitary System.

The Research Problem and Objectives of the Study

The literature broadly explains competitive index and sustainability in the cities and municipalities across all regions. In the CPBRD’s discussion paper, Asuncion (2017, p. 17) asserts that for *economic growth* to be inclusive, it is crucial to “focus on increasing employment and labor productivity.” The following scholars, Nosratabadi, S., Mosavi, A., Shamshirband, S., Kazimieras Zavadskas, E., Rakotonirainy, A., & Chau, KW. (2019) assert that the progress of business models in different domains are not yet clear. Albeit, sustainability efforts clearly result in a positive impact on business performance (Whelan & Fink, 2016), this study justifies the critical role of businesses and their need for competitiveness and sustainability in their operations in their locality. Conflicting claims on the pillars of municipalities’ competitive index caught the interest of the researchers; however, the literature provided limited information on the effects of the four pillars of CMCI on the sustainability of businesses. In addressing research gaps found in the literature, the researchers examined the satisfaction levels of business owners and or managers on competitive index of the local municipalities in Bulacan. Furthermore, this study analyzes the influence of all the four pillars of competitive index towards sustainability of businesses. Finally, the study aims to propose a business sustainability model incorporating policy implications and relevant findings on key pillars of CMCI.

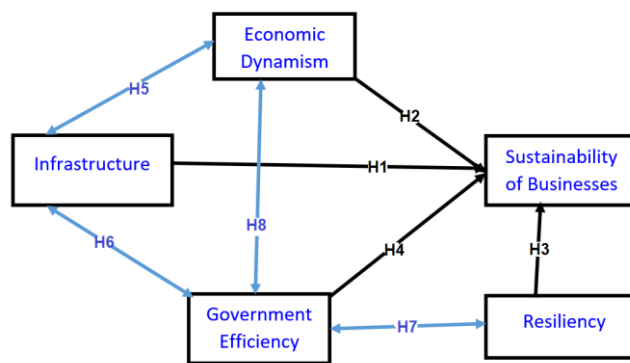


Figure 1: The Research Framework

Figure 1 presents the framework of the study. It shows how the four pillars create an impact on the sustainability of businesses in Bulacan province. It illustrates the relationships between and among infrastructure and economic dynamism; government efficiency and infrastructure; government efficiency and economic dynamism; and lastly, government efficiency and resiliency. The framework is consistent with that of CMCI-DTI (cmci.dti.gov) where all of the key pillars of competitive cities and municipalities contribute to the sustainability of businesses in Bulacan.

The research framework presented in Figure 1 illustrates the different hypotheses (H1-H8) in relation to the four pillars and their relationships that may sustain the businesses in Bulacan province.

Methodology

This section includes the research design, instrument development, method, statistical tests, and parameters that were used by the researchers.

Research Design. This study adopts the quantitative research method. Respondents from the different municipalities in Bulacan evaluated their local city or municipality in terms of their satisfaction on the four pillars such as economic dynamism, government efficiency, infrastructure and resiliency. In addition, competitiveness and sustainability of businesses were also assessed as the dependent variable of the study. A variety of methods were used to create a research instrument that assesses the competitive index of Bulacan municipalities with the aim of generating a model of sustainable business development. A questionnaire was used as a research instrument in this study.

A set of related questions focusing on the pillars of sustainable business development was utilized to create a consistent and valid version of the research instrument. The recommended instrument was developed utilizing tools found in the literature. A 4-point likert scale ranging from 1 (unsatisfactory) to 4 (highly satisfactory) was

used. This was made accessible as a survey questionnaire online. However, due to the constraints imposed by the Covid 19 crisis, face-to-face interviews were excluded.

As a result, the proposed items were tested in relation to the theoretical framework in order to confirm their validity and reliability. The validity of the measuring scale was assessed using the PLS-Algorithm quality standards, which comprised construct dependability and discriminants.

Instruments of the Study

The questionnaire developed was anchored on *CMCI-DTI Manual of Operations (2019)*.

The elements pertaining to economic dynamism, government efficiency, infrastructure, and resilience (DTI, 2019) were revised in this study to evaluate the level of satisfaction of registered businesses in Bulacan in terms of sustainable business development.

A set of related questions was developed based on the pillars and sustainability of businesses was used after a series of validations were done by experts. A 4-point Likert scale ranging from 1 (**unsatisfactory**) to 4 (highly satisfactory) was used.

Analysis methods

This study is a quantitative study using SmartPLS 3.0 version in order to get the desired results. SmartPLS3.0 makes simple group analysis easier to execute than other frequently used packages (e.g., IBM SPSS AMOS). To describe the observed data, the aforementioned statistical program was used to perform factor analysis based on maximum likelihood estimates (Ringle, Sarstedt, Mitchell, & Gudergan, 2018). Furthermore, component analysis was used to assess the dimension's reliability and validity (Hair, Risher, Sarstedt, & Ringle, 2019). Quality criteria for algorithms were adopted (Memon, et al., 2019).

Cronbach's alpha, rho-A, and CR were all greater than 0.7, while AVE was greater than 0.5. The degree of connectivity between latent components impacted the discriminant validity of the variables at 0.85 values (Memon et al., 2019; Hair, Risher, Sarstedt, & Ringle, 2019).

The validity of the measuring scale was assessed using the PLS-Algorithm quality criteria. Constructability, dependability, and discrimination were among the variables examined. T-statistics (1.96), p-value (0.05), factor (0.70), path analysis, and structural equation modeling were used to investigate the connections between the variables. The same multivariate analysis was used to assess the replication applicability of the measurement scale.

Research Hypotheses

H1: Infrastructure significantly affects sustainability of businesses in Bulacan

H2: Economic dynamism significantly affects sustainability of businesses in Bulacan

H3: Resiliency significantly affects sustainability of businesses in Bulacan

H4: Government efficiency significantly affects sustainability of businesses in Bulacan

H5: There is a relationship between infrastructure and economic dynamism towards sustainability of businesses

H6: There is a relationship between government efficiency and infrastructure

H7: There is a relationship between government efficiency and economic dynamism towards sustainability of businesses.

H8: There is a relationship between government efficiency and resiliency towards sustainability of businesses.

Analytical Results and Discussion

Participants' demographic information

A total of 108 *business* participants provided the data for the study. They are business owners and managers whose businesses are located in the different cities and municipalities in Bulacan; i.e., Baliwag, Bustos, Guiguinto, Marilao, Malolos, Plaridel, Pulilan, San Ildefonso, San Rafael, and Sta. Maria.

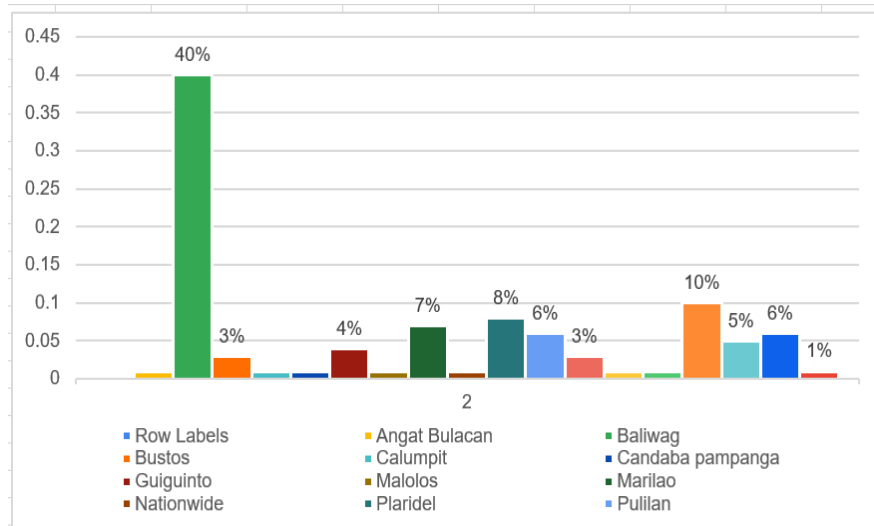


Figure 2: Business-Owner-Manager Respondents in Bulacan

The above figure illustrates the distribution of respondents. Majority of respondents or 40% have their businesses located in the Municipality of Baliwag. Other participants come from the different municipalities in Bulacan. Those identified places outside of Bulacan area were not included in the analysis, thereby, making the data reduced to 94.

Reliability and validity of analysis

A total of 44 items were retained for structural equation modelling. The measurements for reliability and validity examinations detected less than 0.7 factor loading in ECO1, ECO2, ECO3, ECO7, and ECO8 in economic dynamism. Only GOV6 was found low among the indicators of the government efficiency pillar. Furthermore, INFRA3, INFRA9, and INFRA10 are indicators for infrastructure pillar, while three indicators, namely, RES2, RES8 and RES10, were detected with low factor loading below 0.7 recommended (Hair et al., 2019; Sarstedt et al., 2019). Nonetheless, under the Smartpls3 subsample option, an initial sample of 94 evaluated for modeling was bootstrapped to 10,000 samples. The Cronbach alpha ranges from 0.848 to 0.910; the composite reliability (CR) ranges from 0.898 to 0.926, and the average variance explained (AVEs) ranges from 0.513 to 0.688. All the indicators were utilized in this study since the *t*-statistics of 1.96 is considered to rank the external indicators of the four pillars of business sustainability. A *p*-value of less than 0.05 was used to justify regression paths; factor loading values on each internal variable were used to rank the indicators, and variance explained was used to forecast the model's good fit (Oluyinka et al., 2018). Measurement items were consistent with appropriate internal consistency values across the factor loading items. Furthermore, the SmartPLS 3 algorithm analysis found that all of the model's dimensions have appropriate discriminant validity and are suitable for bootstrapping towards the final structural equation modeling in this research.

Structural model output

Following the establishment of a good fit of the measurement model, the structural variance tests were carried out in this study. A structural equation modeling (SEM) technique was utilized to analyze the four pillars of sustainable cities and the municipalities' competitive index towards business sustainability in Bulacan. Also considered is the role of government efficiency on the relationship between the sustainability pillars. The path diagram's structure depicts the relationships between the dimensions based on the tested assumptions. This allows visualization of both the direct and indirect effects of output among the four pillars.

Table 1: Hypothetical Path Coefficients

Dimension of the model analyzed	Sample Mean	Standard Deviation	T-Statistics	P-Values	Descriptive Results
Economic Dynamism --> Sustainability of businesses	0.342	0.096	3.598	0.000	Supported

Government Efficiency --> Economic Dynamism	0.540	0.115	4.761	0.000	Supported
Government Efficiency-->Infrastructure:	0.799	0.034	23.712	0.000	Supported
Government Efficiency-->Resiliency:	0.846	0.029	29.323	0.000	Supported
Government Efficiency-->Sustainability of businesses	-0.042	0.127	0.287	0.774	Not supported
Infrastructure -->Economic Dynamism	0.232	0.116	1.901	0.057	Moderately Supported
Infrastructure --> Sustainability of businesses	0.394	0.138	2.853	0.004	Supported
Resiliency --> Sustainability of businesses	0.287	0.098	2.858	0.004	Supported

The significance of the hypotheses is justified by *t*-statistics (usually $\leq \pm 1.96$) and the computed *p*-value is less than 0.05. The results showed that all fit indexes examined in the case of the hypothesized structural model were significant according to quality index values (Ringle et al., 2018; Memon et al., 2019). Demonstrated the sustainable cities and the municipalities' competitive index towards the business sustainability structure model achieved through bootstrapping analysis in the context of Bulacan, Philippines.

Infrastructures and economic dynamism have path coefficients=0.395 and 0.344 respectively indicated medium effects (Suhr, n.d) on sustainability of businesses. However, government efficiency showed a negative effect with path coefficient =-0.036, while resiliency has a coefficient value of 0.280 which signifies medium effect as well.

Meanwhile, Table 1 illustrates the hypothetical and path coefficients of the significance of the hypotheses is justified by *t*-statistics (usually $\leq \pm 1.96$) and the computed *p*-value is less than 0.05 (usually ≤ 0.05) as shown in Figure 3.

For H1: Infrastructure significantly affects the sustainability of businesses; this is supported at $t = 2.853$; $p < 0.004$. This indicates that the infrastructure in Bulacan regressed on sustainability of businesses investigated and revealed that those indicators index related to infrastructure will affect business owners.

For H2: Economic dynamism significantly affects the sustainability of businesses in Bulacan. It is supported at $t = 3.598$; $p < 0.000$.

For H3: Resiliency significantly affects the sustainability of businesses in Bulacan; it is partially supported at $t = 2.858$; $p < 0.04$.

For H4: Government efficiency significantly affects sustainability of businesses in Bulacan. This hypothesis is not supported as the *t*-value indicated 0.287; *p*-value achieved is 0.774. Hypothesis is rejected with *p*-values greater than 0.5.

For H5: There is a relationship between infrastructure and economic dynamism towards sustainability of businesses. Hypothesis is not fully supported at $t = 1.901$; *p*-value= 0.057 is slightly greater than 0.05.

For H6: There is a relationship between government efficiency and infrastructure towards sustainability of businesses. This hypothesis is supported with *t*-value achieved = 23.712; $p < 0.000$.

For H7: There is a relationship between government efficiency and economic dynamism towards sustainability of businesses. With *t*-value= 4.761, $p < 0.000$, this hypothesis is supported.

For H8: There is a relationship between government efficiency and resiliency towards sustainability of businesses. This hypothesis is supported as *t*-value achieved is 29.323; *p*-value= 0.000 which is lower than 0.05.

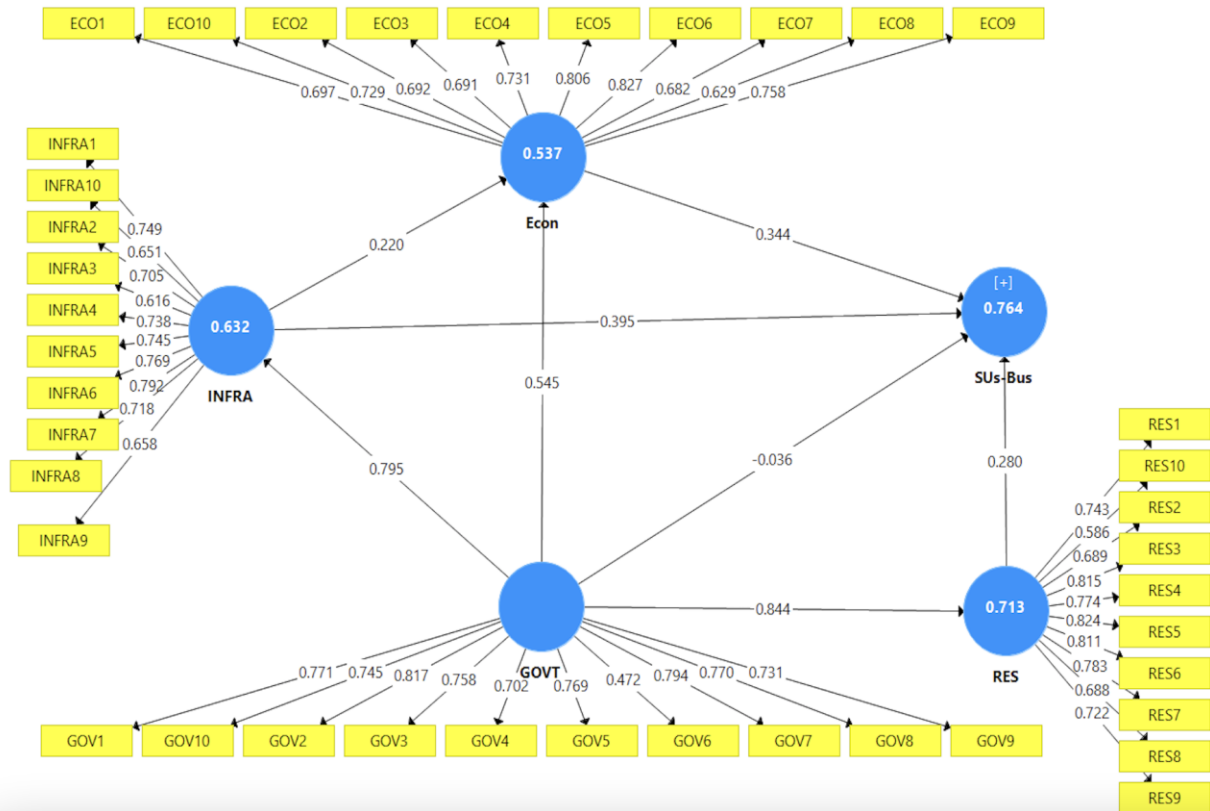


Figure 3: Structural Model Output (Algorithm model)

Significant results have been found in this study. The three pillars, namely: economic dynamism, resiliency, and infrastructure indicated p -values $< .05$ which indicate significant influences on the sustainability of businesses in the province of Bulacan. Interestingly, *government efficiency* (p -values $> .05$) did not present significant results for the sustainability of businesses, but this pillar significantly influenced the infrastructure, economy, and resiliency in the province. Infrastructure revealed a moderately insignificant influence on economic dynamism. This can be attributed to the responsibilities attached to the national government which is not directly in connection with projects of the LGUs.

The impacts of infrastructure on business sustainability in the province of Bulacan is explained by the value of R-square = 0.632 or 63.2% of variance which is explained by *government efficiency*. On the other hand, economic dynamism has an R-square which is 0.537 or 53.7% of the variance in business sustainability. It is explained by *infrastructure* and *government efficiency*. Meanwhile, impact of resiliency has an R-square of 0.713 or 71.3% of the variance which explains business sustainability in terms of government efficiency. Sustainability of businesses obtained an R-square of 0.764 or 76.4% of the variance which is explained by the three pillars of CMCI: economic dynamism, infrastructure, and resiliency. However, the achieved R-squared value in this study was found consistent in several studies related to structural equation modeling (Hair, Matthews, & Sarstedt, 2017; Solomon, 2017; Oluwatayo, 2012).

Factor loadings obtained lower than 0.7 (Memon et al., 2017, Memon et al., 2019) for the key pillar economic dynamism ECO1-size of the local economy; ECO2-growth of the local economy; ECO7-cost of doing business; and ECO8-Financial deepening.

Indicators of *economic dynamism* imply that the local economy should improve on accommodating new businesses; raising the needed capital for a desired enterprise; and attaining the desired revenue. This pillar is supported by measures of business registrations, capital, revenues and permits. The cost of doing business in Bulacan, probably, may not be affordable as perceived by the business owners and managers (Caldera et al., 2019; Ganyam & Ivungu, 2019). Somehow, the services of financial intermediaries such as banks and other financial institutions are accessible for aspiring entrepreneurs. Moreover, municipalities that collect higher revenues from tax collection or funding from the national government have the ability to manage resources more efficiently (Ribeiro et al., 2020).

Resiliency indicators which got lower factor loadings include RES10-Resilience of system and sanitary system; RES8-Resiliency infrastructure/utilities. Respondents are not that confident in terms availability of natural water

source and electricity in times of disaster. This is consistent with the findings of Komives et al. (2005) which emphasize that basic utilities and sanitation are vital for resilience and sustainable development.

Infrastructure indicators also obtained factor loadings below 0.7 such as INFRA9-Information technology; INFRA 10-Availability and accessibility of ATMs; and INFRA3-Availability of basic utilities. INFRA9 indicates that ICT service quality and rates provided by the Local Government Unit (LGU) and broadband penetration are closely associated with cities and municipalities competitive index (McKinsey Global Institute, 2011). The results suggest that the local government needs to improve on telecom coverage, availability of more advanced technologies, and may need to boost broadband penetration and coverage.

Based on CMCI Manual of Operations (DTI, 2019), business environments need consistency of and regularity of water and electricity services. The provision of adequate and reliable infrastructure is indeed important to economies, to households, and to poor households in particular. Improved water supply, sanitation, and electricity services are associated with raising productivity and living standards (Komives et.al., 2005).

There is only one indicator of government efficiency obtained from factor loadings lower than 0.7 (GOV6=0.472). This pertains to the capacity of school services which is supported by Asuncion (2017) whose work stresses that the government needs to invest in something valuable for growth and distribution particularly education.

The impacts of *government efficiency* regressed on infrastructure towards business sustainability in the province of Bulacan. This is explained by the value R-square = 0.632 or 63.2% of variance which is explained GOOD.

Nevertheless, the impact of resiliency, economic dynamism, government efficiency, and infrastructure regressed on *business sustainability*. These are indicated as R-square of 0.764 or 76.4% of the variance, which explains the structured model. The final structured model for business sustainability suggests that the four (4) pillars are very good indicators. Albeit, key findings from the latest literature (Bokolo, 2023) and CMCI report from DTI (2023) revealed another pillar for competitive index i.e. innovation.

Conclusions

The study supports the creation of sustainable value by having the direct contributions of the three pillars (economic dynamism, infrastructure and resiliency). Albeit, government efficiency was not found to be significant in the sustainability of businesses; this pillar is the prime mover and provider of the three significant pillars of CMCI for sustainable businesses. Government is both a provider and enabler of economic dynamism, infrastructure and resiliency (Palgan, Mont & Zvolaska, 2019; Giezen, 2018).

Results of the study show indicators of economic dynamism which suggests that the local economy should improve on accommodating new businesses; raise the needed capital for a desired enterprise; and attain the desired revenue. This pillar is supported by measures of business registrations, capital, revenues, and permits.

Business owner manager respondents are dependent on government's efficiency in terms of availability of natural water source and electricity particularly in times of disaster. This is consistent with the findings of Komives et al. (2005) which emphasize that basic utilities and sanitation are vital for resilience and sustainable development.

Improvements in municipalities emanate from innovations in technology and new infrastructures such as e-mobility of businesses (Bokolo, 2023; DTI, 2023).

Recommendations

This paper recommends to the local government that their policies and programs be integrated since these are essential for a strategic framework for sustainable development. Considering the limitations of the study, scholars may explore conducting a similar study with a bigger sample size covering different regions. Another avenue for research is to test the proposed model in this study.

On the note that government efficiency indicates an insignificant influence on the competitiveness and sustainability of businesses, it is crucial to have transformative policies of decentralizing the process in government services as emphasized in the study of Mira & Gutierrez (2017).

The proposed model for sustainable businesses is based on the model achieved from Structural Equation Modelling which can be adopted by the cities and municipalities across all regions. The crucial role of the government, being the enabler of the three pillars: economic dynamism, infrastructure, and resiliency leading to

the sustainability of businesses. The competitiveness and sustainability of businesses within LGU showed evidence of government demonstrating efficiencies through infrastructure, resiliency, and economic dynamism. However, in the latest report of DTI (2023), the province climbed to rank no. 8 again in 2023 based on the overall score on five pillars which already includes the new pillar, *innovation*.

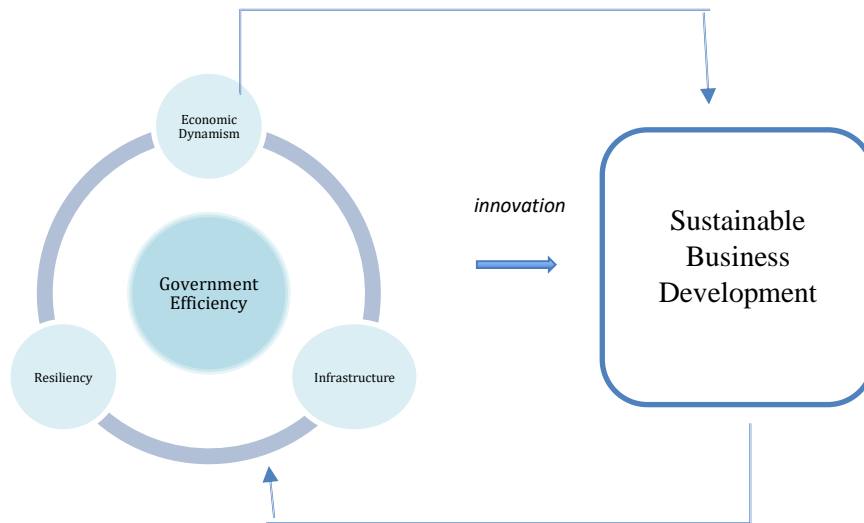


Figure 4: The proposed model for sustainable business development

For adaptive capacities in the new normal, both national and local governments should focus on improving performance in terms of economic dynamism, particularly in improving economic growth and financial performance. Ribeiro et al. (2020) confirm revenues from taxes of business can best determine the municipalities' financial growth and economic efficiency.

The proposed model is supported by previous studies (Serebrisky 2014; Villamejor-Mendoza, 2020) highlighting infrastructure to be well-planned, built, and maintained. Regional development in the Philippines can be attributed to the availability and accessibility of basic infrastructure services such as roads, water supply, electricity, and including technology infrastructure (Mira & Gutierrez, 2017; Distor & Khaltar, 2022). The proposed model is crucial for the adaptive capacity development of competitive cities and municipalities providing adequate quality services to promote sustainability of businesses.

Areas of Future Research

Limitations of this study were mainly on the small sample size of respondents, business managers and business owners. For future research, findings of this study can be further validated involving business enterprises in the cities and municipalities of third world countries.

Policy Implications

Implications of this study are vital for designing strategy policies for implementation by the national and local government applicable in the context of developing countries. Important findings of the study will help decision makers in promoting inclusive, holistic, and innovative sustainable business development. Hence, it's considerably noted that some indicators of CMCI need to be addressed, established or enhanced across LGU types as recommended by Rayel (2021). Thus, policymakers and local government executives need to contextualize their policies, efforts, and resources based on the type of LGU to improve its competitiveness thereby addressing sustainability issues of businesses in the subject province or even across all regions in the country.

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Statements and Declarations of Conflicting Interests

The authors hereby declare that there are no conflicting interests in terms of financial concerns, authorship, and publication of this research article.

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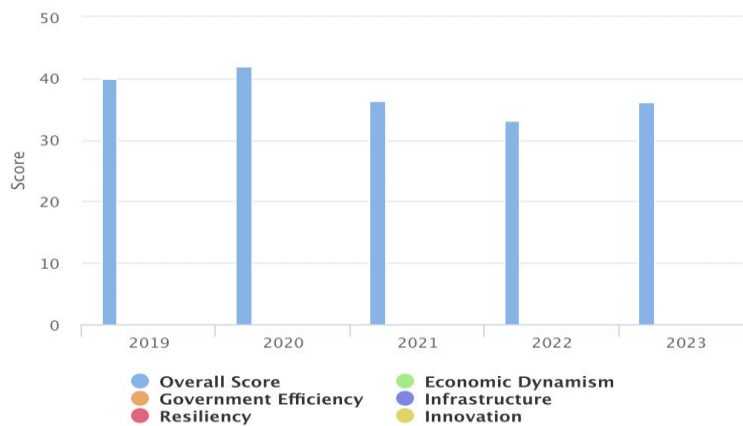
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Appendices

Appendix 1



Bulacan Province Overall Competitive Index Score (DTI, 2023)