

ORIGINAL ARTICLE

Electronic invoicing and its impact on tax collection in Peru's construction sector

ABSTRACT

Peru is no stranger to tax evasion. In 2021, tax evasion and avoidance reached 8% of the Gross Domestic Product (GDP), a magnitude equal to almost twice the amount of the budget allocated to the education sector. Therefore, the purpose of this research was to determine the impact on tax collection generated by electronic invoicing in the construction sector in Peru. The method used was quantitative in nature and the design was non-experimental time series, using the technique of statistical and bibliographic data collection. This research was carried out with the use of mathematical and statistical tools of the SPSS program, obtaining as a result that the use of electronic invoicing had a positive impact on tax collection in Peru between 2010 and 2021, constituting a mechanism to combat tax evasion in the construction sector. For the Shapiro-Wilk normality hypothesis test, the Pearson's rho statistical test was used, which shows a coefficient P value = 0.002, which, being less than 0.05, defines a high level of significance between the correlated variables. It is concluded that the prevalence of electronic invoicing is significantly significant in the collection of taxes in the construction sector in Peru; therefore, the prevalence could increase since electronic invoicing will be mandatory for all companies in the sector only in June 2022.

Keywords: Electronic invoicing; Tax culture; Tax collection; Construction; Tax culture; Tax collection.

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INTRODUCTION

An existing problem in Latin American and Caribbean countries that affects tax collection is tax evasion. This problem has been studied by Zurita (2021), which is why electronic invoicing has emerged as a promising mechanism to combat tax evasion and increase tax collection in developed or developing countries, accompanied by the advance of technology.

In this context, Sierra and Vargas (2016) argue that the country's development has been harmed by tax evasion, as it has directly affected the financing of public spending. On the other hand, Velazco (2016) points out that electronic invoicing has emerged as a defense mechanism and tool that has developed in a globalized world, whose importance has increased with technology (p. 4). In this sense, in almost all Latin American countries, their own tax administration has encouraged the adoption of e-invoicing.

In this regard, Luzgina (2017) states:

La talla de la corrupción y la evasión fiscal pueden diferir no solo por país, sino también por sector. Por ejemplo, la construcción es tradicionalmente un área con un riesgo muy alto de corrupción y el desarrollo de la economía sumergida. [The extent of corruption and tax evasion can vary not only from country to country, but also from sector to sector. For example, construction has traditionally been an area with a very high risk of corruption and the development of the informal economy.] (p. 2)

Likewise, Bermúdez (2018) argues that tax authorities worldwide have the challenge of raising awareness among citizens so that compliance with their obligations is voluntary, thus ensuring financial sustainability, using technological means and government policies (p. 11).

The application of e-invoicing in Latin America was born to support the fight against tax evasion. From its beginnings, it has become a major contribution to international taxation, which has evolved over the last 10 years, with Argentina as a pioneer. According to Hatfield (2021), Latin American countries such as Brazil, Mexico and Argentina are leading the fight

against fraud by implementing electronic controls in their e-commerce transactions, creating highly regulated ecosystems (para. 1). In this context, the Inter-American Development Bank (IDB) and the Inter-American Center of Tax Administrations (CIAT) (2018) point out that “existe evidencia que la facturación electrónica mejora la recaudación, en América Latina” [there is evidence that electronic invoicing improves collection in Latin America] (p.24).

Bérgolo *et al.* (2018) chose to use an event and difference-in-difference methodology, taking into account the companies with the highest invoicing in Uruguay (revenue), which had the obligation to carry out electronic invoicing, managing to capture at different times the effect of a policy whose percentage effect on revenue estimated an impact of 3.7% on the amount of payments of companies. (p.19).

In Peru, a precedent is the research of Vega (2020), whose objective was “determinar la relación entre la Facturación Electrónica y la Rentabilidad de la empresa Contadores y Emprendedores SAC” [to determine the relationship between electronic invoicing and the profitability of the company Contadores y Emprendedores SAC] (p. 10).

Thus, the researcher Vega (2020) used “tipo de investigación No experimental de corte Transversal; porque está enfocada en una empresa y un año específico que es el 2019, además no se ha manipulado el contexto donde suceden los hechos ni las variables” [non-experimental research type of transversal cut; because it is focused on a company and a specific year, which is 2019, in addition, the context where the facts and variables occur has not been manipulated] (p. 41). After developing the research, Vega (2020) concludes that “Existe relación entre la facturación Electrónica y la Rentabilidad en la Compañía Contadores y Emprendedores SAC del distrito de San Juan de Lurigancho en el año 2019” [there is a relationship between electronic invoicing and profitability in the company Contadores y Emprendedores SAC in the district of San Juan de Lurigancho in 2019] (p. 63). For his part, Gonzales (2018) conducted an analysis of consistency between tax culture and tax collection (p. 1).

From the position of Pedro Francke, who headed the Ministerio de Economía y Finanzas (MEF) of Peru in 2021, in an interview in the official newspaper *El Peruano* (Agencia Andina, 2021), he makes it clear that the problem of tax avoidance and evasion in Peru came to represent 8% of GDP, detailing that it is equivalent to S/ 64,000 million, due to the existence of false invoices generated to reduce the payment of taxes by taxpayers who do not pay taxes and who, many times, transfer their income abroad.

It is important to emphasize that, according to the National Superintendence of Customs and Tax Administration (SUNAT, 2021), “reconoce la importancia de promover la cultura tributaria y aduanera entre todos los ciudadanos de nuestro país; especialmente, entre estudiantes y docentes de educación básica regular, estudiantes de educación superior, emprendedores y MYPES” [it is important to promote the tax and customs culture among all citizens of our country, especially among students and teachers of regular basic education, students of higher education, entrepreneurs and MYPES] (p. 38).

In this regard, Andina Agencia Peruana de Noticias (2021) reported that

La evasión y la elusión tributarias se han convertido en verdaderas trabas del desarrollo del Perú. Las cifras del Ministerio de Economía y Finanzas (MEF) hablan de un 8% del Producto Bruto Interno (PBI) anual que se deja de recaudar por estos motivos, y que dicha pérdida social podría mitigarse con la facturación electrónica. [Tax evasion and avoidance have become real obstacles to Peru's development. Figures from the Ministerio de Economía y Finanzas (MEF) indicate that 8% of the annual Gross Domestic Product (GDP) is not collected for these reasons, and that this social loss could be mitigated with electronic invoicing.] (par.1)

In essence, Bellon et al. (2022) point out that improving control over the invoicing process is beneficial because the actual tracking of transactions can be done and, in this way, the tax administration can reduce the omission of sales or over-invoicing, as well as fraudulent

transactions or errors. As the Sovos (2023) website states, “en Perú, el uso de la factura electrónica comenzó en el año 2010” [in Peru, the use of electronic invoicing began in 2010] (par.1).

Figure 1 shows the evolution of e-invoicing over time, based on the legal basis. Looking at the timeline, we can see that e-invoicing has been made mandatory by sector or turnover to date.

In Peru, construction is a strategic economic sector for the country's development. Its importance lies in the fact that it generates long-term investment assets that allow the execution of infrastructure works for the generation of means of production or livelihoods. According to Zamora and Polar (2022),

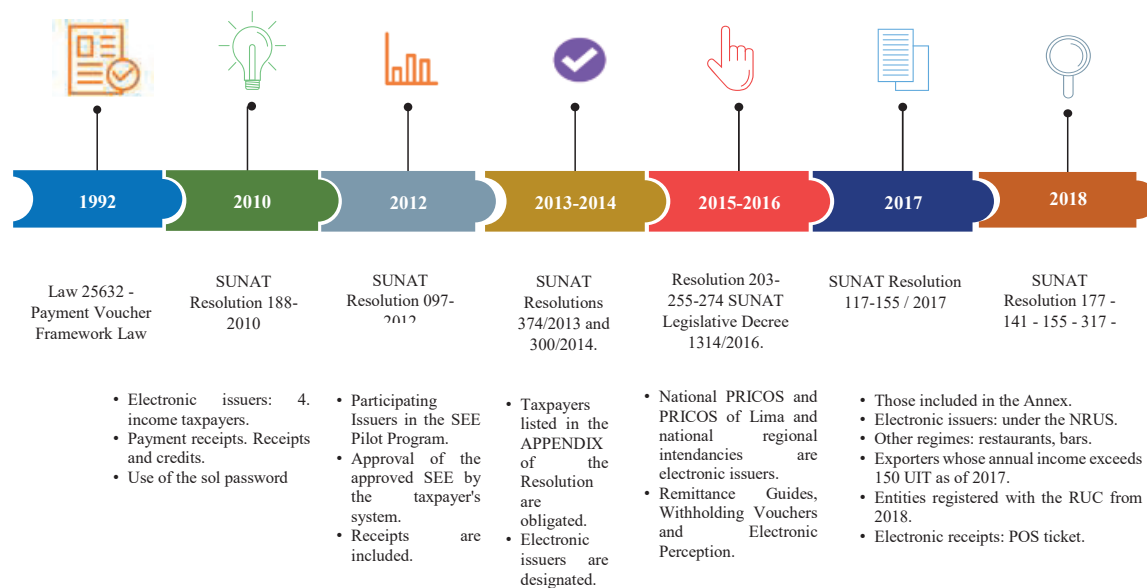
El comportamiento del PBI del sector construcción guarda estrecha correlación con el comportamiento del PBI global del país. En el 2020, por el Covid-19 el PBI del sector decreció 13.5%, mientras que el PBI nacional decreció un 11%. En el 2021, el sector construcción creció 34.9%, mientras que el PBI nacional creció un 13.3%. [The behavior of the construction sector's GDP is closely correlated with the behavior of the country's overall GDP. In 2020, according to Covid-19, the sector's GDP decreased by 13.5%, while the national GDP decreased by 11%. In 2021, the construction sector grew by 34.9%, while the national GDP grew by 13.3%.] (p. 133)

In view of the above, this paper raises the question “What is the impact of electronic invoicing on tax collection in the construction sector in Peru?” and therefore the objective was to determine the impact of electronic invoicing on tax collection in the construction sector in Peru.

METHODS

The method of study used in this paper is within the quantitative approach, that is, statistical information has been used, determined by its significance and importance, classified by the impact it has on the Peruvian economy. The instrument used was the bibliographic cards,

Figure 1
Development of e-invoicing in Peru



Note: Prepared by the authors, 2023.

which contained the bibliographic data of the documentary sources used, as well as a record of electronic pages, which allowed the digital analysis of the information stored in different electronic databases.

The design used in the research was non-experimental, since the study variables were not controlled; therefore, no experiment can be carried out, that is, they are already in the past. Regarding the techniques and instruments used for data collection, the technique of documentary and bibliographic analysis, content analysis of existing statistical and theoretical information was used.

For this research, numerical data were collected and analyzed from different sources, such as the National Superintendence of Customs and Tax Administration (SUNAT) and the National Institute of Statistics and Informatics (INEI).

This research has used mathematical tools and statistical analysis of the SPSS program to achieve the objectives and quantify the problem of this research, as well as to determine the type and degree of correlation between va-

riables, using figures from January 2010 to December 2021.

RESULTS

For the following results, the statistical information from 2010 to 2021 extracted from SUNAT and INEI was used for aspects related to the research objective. The descriptive results show that the average for the analyzed periods is 5528.0783 for the tax variable and 42464.6667 for the GDP variable. It should be noted that these results have been detailed as shown in Table 1.

Scatterplot

Figure 2 shows the scatterplot of the variables taxation and GDP in the construction sector. The data show a relationship close to the line; therefore, taxation has a normal distribution on GDP.

Normality Test

The Shapiro-Wilk test of normality hypothesis was performed. Table 2 shows a coefficient P value = 0.002, which, being less than 0.05, defines a high level of significance between the correlated variables. Likewise, the R-square of

Table 1

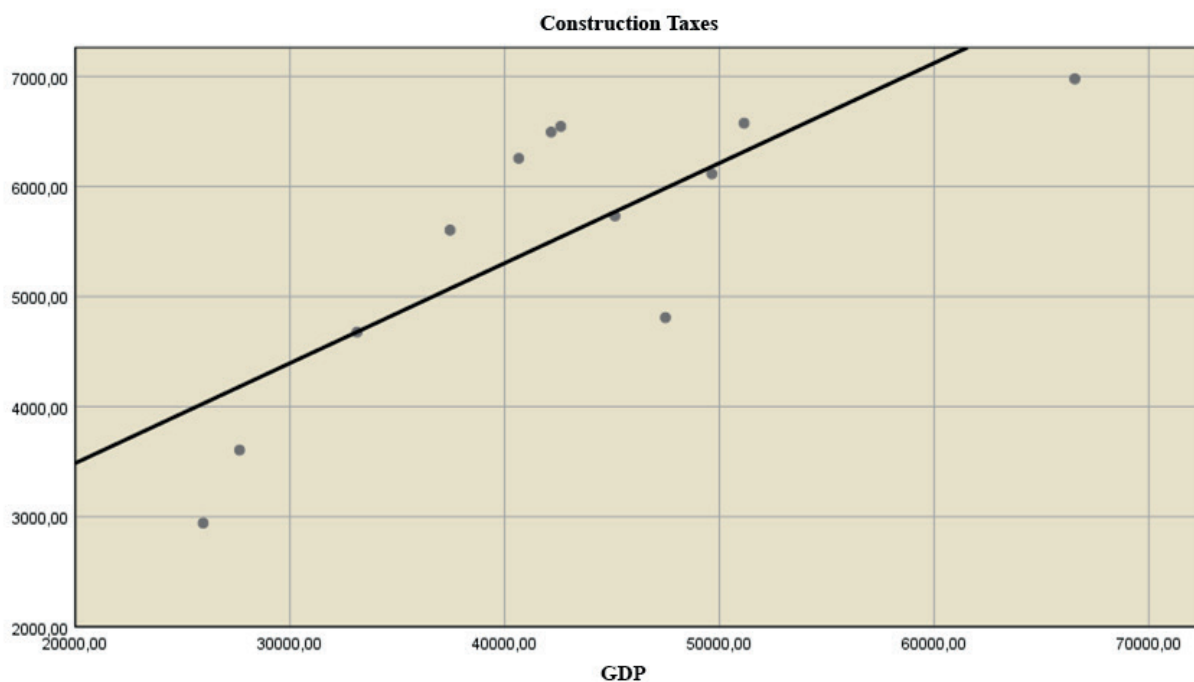
Results (millions of soles)

	N	Range	Minimum	Maximum	Average	Standard deviation.	Variance
Tax	12	4036.32	2941.96	6978.28	5528.0783	1269.27901	1611069.212
GDP	12	40595	25958	66553	42464.6667	11067.58911	122491528.8

Note. Prepared by the authors, 2023.

Figure 2

Correlation Chart between Taxation and Construction Sector GDP (millions of soles)



Note: Prepared by the authors, 2023.

Table 2

Correlation between Taxation and GDP in the Construction Sector

	R	R ²	R ² adjusted	Standard error	Change statistics				
					Change in R ²	Change in F	gl1	gl2	Next Change in F
1	,793 ^a	0.628	0.591	811.80855	0.628	16.891	1	10	0.002

Note: Prepared by the authors, 2023.

0.6281 shows a high degree of concentration of the values of taxation and GDP of the construction sector during the study period.

Based on the above, the percentage indicator of the construction sector (taxation) has been taken from this information to show that the tax collection will increase from 2010 to 2021, a period in which electronic invoicing has developed and consolidated; therefore, the tax collection resulting from this economic sector

has a greater share in the percentage of GDP, as well as a positive impact on tax evasion.

Hypotheses testing

The general hypothesis will be tested: Electronic invoicing has an impact on tax collection in the construction sector in Peru. To validate or reject the hypothesis, the Pearson's rho statistical test was used, the results of which are presented in Table 3.

Table 3*Correlation according to Pearson's coefficient*

		Construction Tax	GDP
Construction Tax	Pearson's Corr.	1	0.793
	Sig. (bilateral)		0.002
	N	12	12
GDP	Pearson's Corr.	,793**	1
	Sig. (bilateral)	0.002	
	N	12	12

Note: Prepared by the authors, 2023.

DISCUSSION

According to the analysis carried out on the impact of electronic invoicing on tax collection in Peru, it has been observed that there is a positive contribution during these last years in an ascending manner from 2010 to 2021; however, it has not achieved that taxpayers voluntarily comply with their tax obligations in full, this is due to the distrust that exists in the misuse of public resources.

For his part, Paredes (2019), in his research, stated that “mediante la facturación electrónica se reducen costos y tiempo para emitir un comprobante de pago, lo cual beneficia al contribuyente y al recaudador a realizar un mejor control sobre los importes declarados mediante los Libros Electrónicos (PLE)” [through electronic invoicing, the cost and time to issue a payment voucher are reduced, which benefits the taxpayer and the tax collector to perform a better control over the amounts declared through the electronic books (PLE)] (p. 119).

In essence, the Bellon et al. (2022) study shows that

Ha encontrado efectos positivos en el caso del Perú, donde la facturación electrónica ha contribuido a que las ventas, las compras y el valor agregado declarado por las empresas aumenten en más del 5% durante el primer año después de la adopción. Dicho impacto se concentra en las empresas más pequeñas y los sectores que presentan mayores tasas de evasión. Lo anterior da a entender que esta herramienta contribuye a reducir los costos de cumplimiento y fortalece

los mecanismos disuasivos de fiscalización y control, por lo que representa un complemento importante en lo que se refiere al tratamiento tributario de los pequeños contribuyentes en los países de la región. [It found positive effects in the case of Peru, where electronic invoicing contributed to an increase of more than 5% in sales, purchases and value added declared by companies in the first year after its introduction. This impact is concentrated in the smallest companies and in the sectors with the highest tax evasion rates. The above suggests that this tool contributes to reducing compliance costs and reinforcing the deterrent mechanisms of control and monitoring, and therefore represents an important complement to the tax treatment of small taxpayers in the countries of the region.] (p. 3)

Zamora and Polar (2022) conclude that the GDP of the construction sector in Peru is closely correlated with the behavior of the global GDP, since this sector is one of the most important in our economy.

On the other hand, Reyes (2023) in his research revealed that electronic invoicing was a very effective way to increase the tax collection of construction companies in the district of Sullana, showing a coefficient of 0.863 and an asymptotic significance value of $p < 0.01$, which represents the correlation between electronic invoicing and tax collection. (p.31).

There are several modalities to promote tax culture, which serve as a mechanism to reduce tax evasion, among the predominant modalities in civic tax education.

Based on the above, it can be seen that the development of electronic invoicing has had a positive impact on tax collection, since tax collection has been higher, and GDP has increased.

In this context, it has been demonstrated that the development of electronic invoicing has had an impact on tax collection in Peru; however, it is still not possible to create a tax culture on the importance of using electronic invoicing, so it is proposed to include in the school curriculum a course on tax culture through electronic tools, in addition to having access to consult on the SUNAT website which companies do not implement electronic invoicing and access to consult on companies that do not comply with the minimum requirements for electronic invoicing, although they are obliged to do so.

Finally, after observing the results, it is important to consider the following questions for future research: How will the tax compliance gap be related to the mandatory use of electronic invoicing as of 2022, how will tax collection in the construction sector of the Peruvian economy evolve after the mandatory use of electronic invoicing as of July 2022, and how will tax collection in the construction sector of the Peruvian economy evolve after the mandatory use of electronic invoicing as of July 2022?

CONCLUSIONS

As a result of the research, it can be concluded that there is a positive impact of electronic invoicing on tax collection in the construction sector (2010-2021). It is noted that this could increase due to the fact that as of June 2022, electronic invoicing will be mandatory for all taxpaying companies, according to the Superintendency Resolution N°000128-2021/SUNAT of 2021.

According to Zamora (2022), the GDP of the construction sector is closely related to the behavior of the country's overall GDP, which was one of the variables considered in this research. Thus, the statistical analysis by means of Pearson's coefficient indicates a correlation of 0.002 between the fiscal variables and the GDP of the construction sector; in other words, a high level of significance is defined between the correlated variables.

It is recommended that the State implement control and formalization measures in the construction sector, for which it should provide facilities through training and social programs for the implementation of electronic invoicing. Likewise, it is suggested that a comprehensive register be created for the formalization of construction companies so that this sector can increase its contribution to tax collection and, consequently, support the sustainable development of the country.

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Conflicts of interest

The authors have no conflicts of interest to declare.

Author contributions

Jenny Yovana Ancco Vasquez (lead author): conceptualization, data curation, formal analysis, writing (original draft, review, and editing).

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Víctor Fernando Jesús Burgos Zavaleta (coauthor): conceptualization, formal analysis, supervision, validation, writing (original draft)