Macroeconomic Environment and Persistence of Accounting Information of Companies Listed on International Stock Exchanges

Henrique Carvalho Bezerra Morais
Master in Accounting Sciences from the Federal University of Rio de Janeiro (UFRJ), Brazil.
Teacher Assistant at Universidade Federal do Pará
Rua Augusto Corrêa, 1. Guamá, Belém – PA, Brasil. CEP: 66075-110
E-mail: henriquecbm@ufpa.br
ORCID: https://orcid.org/0000-0002-8608-5740

Paulo Vitor Souza de Souza
PhD in Accounting, Universidade de Brasília
Associate Professor at Universidade Federal do Paraná
Avenida Prefeito Lothario Meissner. Jardim Botânico, Curitiba – PR, Brasil. CEP: 80210-170
E-mail: paulovsouza@ufpr.br
ORCID - https://orcid.org/0000-0001-5746-1746

Jonathas da Silva Ferreira
Bachelor's student in Accounting, Universidade Federal do Pará
Rua Augusto Corrêa, 1. Guamá, Belém – PA, Brasil. CEP: 66075-110
E-mail: jonathasferreira578@gmail.com
ORCID - https://orcid.org/0009-0004-7808-511X

Abstract
This study aims to verify the relationship between macroeconomic measures and the persistence of accounting information in companies listed on international stock exchanges. To this end, a sample with an average of 30,878 companies was composed, with data from publicly traded companies active on stock exchanges in 42 countries from 2008 to 2021, totaling 432,290 observations. To measure the earnings persistence, cash flow, and accruals, the models proposed by Sloan (1996), Dechow and Schrand (2004), and Dechow et al. (2010) were used. The following measures were used to represent the macroeconomic environment: inflation, GDP, effective interest rate, exchange rate, unemployment, and public debt, whose data were collected from The World Bank platform. The results obtained in this study showed that the persistence of accounting information is negatively related to inflation, exchange rate, and unemployment rate, and positively associated with public debt and GDP and that the effective interest rate does not impact it. It is therefore highlighted that companies' accounting information can be influenced by the macroeconomic environment in which they operate; that is, the country's economic scenario tends to significantly affect the quality of the information reported by its companies. Therefore, the findings contribute to the literature and also enable an understanding of how the quality of accounting information behaves in different macroeconomic scenarios from the perspective of persistence, a measure considered useful to users of accounting information and which represents the volatility of accounting figures over time.
Keywords: Macroeconomic Environment; Quality of Accounting Information; Persistence; Capital Markets.

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1 Introduction

Accounting is essential within an organization since it generates information used in decision-making (Beatty & Liao, 2014). However, for information to be relevant, it must to be of quality; that is, it must represent the entity's real performance (Dechow et al., 2010).

The attributes that aim to represent the quality of accounting information are extensive. However, when analyzing accounting reports, users of information often observe earnings as the main source of information (Fagundes et al., 2024). From this perspective, earnings persistence is considered one of the main attributes representing accounting information quality (Arruda et al., 2015). The persistence of accounting information is the result of operational and investment decisions made in the current period, contributing to the maintenance of future results, thus representing a low risk due to its constancy (Baginski et al., 1999).

Persistence has the power to demonstrate which components of the result have greater sustainability, being very useful for evaluating the company's financial reports (Hanlon, 2005). For Schipper and Vincent (2003), the persistence of results refers to the power to predict transience and the behavior of constancy of earnings, which supports the decision-making of investors, mainly in evaluating the performance of companies. For factors such as these, persistence becomes a construct that can increase the quality of accounting information.

Given the importance of quality accounting information, it is important to understand how the macroeconomic environment can impact the accounting information generated. After all, it is understood that macroeconomic factors (GDP, inflation, and interest rates) influence business since these are subject to the economic conditions of the regions where they are located (Pandini et al., 2018). Therefore, various users of accounting information must be aware of the macroeconomic environment to make the best decisions, especially regarding investments (Oliveira & Frascaroli, 2014).

Some researchers have investigated the relationships between earnings persistence and certain macroeconomic measures. Czajor et al. (2013) found a positive relationship between GDP growth and earnings persistence in emerging markets. In turn, Liu et al. (2018) identified a negative relationship between inflation and earnings persistence in Taiwanese companies; that is, earnings persistence tends to be lower in an environment of high inflation. Pimentel and Lima (2015) observed reductions in earnings persistence the higher the country's effective interest rate.

However, these studies did not analyze other macroeconomic measures that may impact business and, consequently, the persistence of accounting information, such as GDP per capita, current GDP, exchange rate, unemployment rate, and public debt. Therefore, it is important to deepen the understanding of how the macroeconomic environment relates to the quality of accounting information. Thus, this study aims to verify the relationship between macroeconomic measures and the persistence of companies' accounting information on international stock exchanges.

The originality of the research lies in the joint analysis of the relationship between eight macroeconomic measures and the persistence of accounting information of companies listed on stock exchanges at an international level. With a large sample, with an average of 30,878 companies belonging to 42 countries over 13 years (2008-2021), the study uses models endorsed by the literature to measure the earnings persistence, cash flow, and accruals and investigates the impact of six macroeconomic indicators. Other studies have not previously explored the Five macroeconomic indicators analyzed, confirming the research's originality.

This study offers important insights not only for academics but also for a range of stakeholders. By examining the behavior of accounting information in various global economic contexts, the study can identify risk and predictability patterns, strengthening users' confidence in capital allocation and credit granting. Given the economic context, it can also contribute to regulators' better perception of organizations' reporting quality. This refined understanding

empowers users in decision-making and enables financial institutions to mitigate risks more accurately.

The detailed analysis of the relationship between the persistence of accounting information and macroeconomic factors not only fills a gap in the literature but also provides a broad overview of the impact of the external environment on the generation of accounting information by organizations in various economies. In addition, the international scope of the sample and the inclusion of a larger number of macroeconomic variables can contribute to the final considerations of this study being applicable and relevant in a global context. Including new measures related to the macroeconomic environment can better guide investors and creditors at an international level to better allocate resources. Therefore, the study aims to contribute to various users who trade resources in international capital markets and need information to assist their decisions.

2 Literature Review

2.1 Persistence as an attribute of informational quality

Information quality can be defined as a component that faithfully represents the company's performance and is relevant for decision-making (Dechow et al., 2010). Therefore, its presence is important in the company's reported earnings, as a higher level of quality enhances the company's reputation in the market.

According to Schipper and Vincent (2003), some attributes can influence the quality of accounting information, among which is earnings persistence. Stakeholders are generally more attracted to earnings that present a certain regularity and predictability in their reports, that is, persistent earnings.

Most studies are based on research by Lev (1983), who reports that persistent earnings demonstrate non-random behavior, presenting a certain constancy. This behavior is well-received by users, who feel more secure concerning the company's performance.

Persistence can demonstrate which earnings components are more sustainable and recurrent, a power that is very useful for users when evaluating companies' financial reports (Hanlon, 2005). Earnings persistence has two components: accruals (the result of using the accrual basis, given by the difference between economic earnings and operating cash flow) and effective cash flows (Sloan, 1996; Dichev et al., 2013).

Persistence is related to operational and investment decisions made in the current period, generating earnings that will be sustained and increased in future periods (Rosita & Srimindarti, 2023). Because it is well regarded in the market, persistence brings certain advantages to companies, such as greater attractiveness to investors and increased confidence of creditors.

It is noted that persistence is a characteristic of accounting earnings with the power to increase its quality due to its ability to sustain certain patterns and trends in earnings over several periods, which helps to predict future results and generates useful information for evaluating share prices (Dechow et al., 2010).

2.2 Macroeconomic environment and research hypotheses

The macroeconomic environment is highly relevant to business, as it comprises a set of factors that impact the lives and decisions of internal and external users of accounting information (Martini et al., 2013), such as inflation, effective interest rate, gross domestic product (GDP), exchange rate, employment level, and public debt.

Inflation is one of the macroeconomic factors best known to the general population. However, its concept is rarely discussed (Croitoru, 2023). The general concept used for it is a continuous and proportional increase in the value of durable and non-durable consumer goods, capital goods, inputs, labor, and natural resources; that is, it is a persistent price increase in

general (Phelps, 1973). Thus, it becomes important to understand how the macroeconomic factor "inflation" impacts societies.

Liu et al. (2018) analyzed the impacts of inflation on persistence and concluded that persistence reduces in times of high inflation. In addition, Scholtens and Kang (2012) found that countries with low inflation rates tend to engage less in income smoothing (IR), which may be evidence of a lower need for income smoothing since companies from countries with low inflation rates tend to have more persistent earnings. In other words, if income smoothing is performed to achieve persistence (Walker, 2013) and companies from countries with low inflation have more persistent earnings (Liu et al., 2018), it makes sense to expect that companies from countries with lower inflation engage less in income smoothing, as evidenced by Scholtens and Kang (2012), that is, lower inflation is associated with higher quality accounting information. In addition, rising prices may lead to an imbalance between the entity's revenues and expenses, given that high inflation is related to lower economic growth (Olamina et al., 2022), which may make companies' earnings more volatile. It is, therefore, expected that:
H_1: The higher the inflation, the lower the persistence of accounting information.

Another macroeconomic factor is the Gross Domestic Product (GDP), which is one of the most widely used indexes for the economic analysis of certain regions (countries, states, or cities), as it can represent the sum of all final goods and services in a given period, usually a year or quarter (Passos et al., 2012). GDP plays an important role in macroeconomics; it is one of the most widely used indicators for measuring economic growth and a given territory's wealth (Trinh, 2017).

Regarding GDP and persistence, Czajor et al. (2013) showed that countries with GDP growth have more persistent earnings; that is, there is a positive relationship between the persistence of accounting earnings and GDP growth. Since GDP growth is considered the economic growth of a region in a given period (Trinh, 2017), it is expected that the greater production of goods and services by companies in a country will result in greater consistency in obtaining revenue and, consequently, earnings. Therefore, it is expected that:
H_2: The higher the GDP, the greater the persistence of accounting information.

The interest rate is conceptualized as a relationship between amounts paid or received at the end of a given period and the initial value of the capital, sometimes referred to as the price of money (Blanchard, 2023). The effective interest rate can influence the values and costs of all sectors of the economy, impacting everything from household expenses to stakeholder decisions (Omar, 2008). Hall et al. (1977) address the relevance of the interest rate by showing its role in influencing important investment decisions. Therefore, the effective interest rate can impact a country's economic growth, given its ability to affect investment and consumption (Dupor, 2001).

Pimentel and Lima (2015) observed that companies in countries with high effective interest rates have less persistent earnings since they can reduce the present value of future earnings. It is worth noting that the effective interest rate can influence all sectors of the economy, as it is a relevant factor impacting consumption in general (Omar, 2008), in which in times of high interest rates, the consumption of goods and services tends to fall (Dupor, 2001), that is, consumers tend to be more reclusive regarding consumption, and this can lead to instability in the revenues and results of entities, so it is expected that:
H_3: The higher the effective interest rate, the lower the persistence of accounting information.

The exchange rate is a macroeconomic indicator that represents the value of a foreign currency in the national currency, thus reflecting the cost of one currency relative to another (BACEN, 2023). The index is a fundamental variable for development. A competitive exchange rate is best for economic growth because in an appreciated exchange rate scenario, the local industry is unprotected against imports, its competitiveness is weakened, and the export of more sophisticated industrial products is hindered (Serrano, 2010).

Studies that sought to understand how the exchange rate relates to information quality attributes are scarce, and when it comes to persistence, they are nonexistent to date. The works of Chang et al. (2013) and Sari and Meliyant (2019) showed that the higher a country's exchange rate, the more companies tend to smooth their results. On another point, Kolozsvari and Macedo (2016) and Kajimoto et al. (2019) highlighted that companies that smooth their results have less persistent accounting information than those that do not, and even that some information ceases to be persistent. Thus, if the higher the exchange rate, the more entities smooth their results, then it is expected that the persistence of the information will be lower. This result is anchored in the economic premise that high exchange rates can unbalance a country's trade balance, harming sectors that must import goods or work with travel and tourism. In other words, high exchange rates can generate instability in the income and expenses of entities and, consequently, in earnings. In this sense, it is expected that:

H_4: The higher the exchange rate, the lower the persistence of accounting information.

The employment level demonstrates the employability situation of a country. It can be measured through indicators such as the unemployment rate, which represents the portion of the unemployed population that is part of the workforce in a given period (Zylberstajn & Balbinotto, 1999). According to the International Labor Organization (2011), the unemployment rate is one of the metrics most used by the economy around the world to represent the number of people in a situation of unemployment. The relevance of this index is related to its power to impact various sectors, such as the consumer sector (Sicsú, 2019).

Previous studies have not explored the relationship between the unemployment rate and the quality of accounting information. For exploratory purposes, this study considered this variable to provide new insights on the topic. The unemployment rate can be considered a macroeconomic indicator that has a significant impact on a population's ability to consume goods and services (Sicsú, 2019) since without income or with low income; the population has fewer resources to consume goods and services (Barbosa & Nogueira, 2018). This factor can generate reductions and instability in sales and, consequently, in the companies' results. In this sense, it is expected that:

H_5: The higher the unemployment rate, the lower the persistence of accounting information.

Public debt comes from financing that aims to cover a budget deficit generated because revenues are insufficient to cover government expenses (Chiappin et al., 2019). There is an implicit concern about it because, in the event of a lack of control, its consequences tend to harm economic stability by increasing public deficits through the effects of interest (Leismann & Antonovz, 2016).

Also, without evidence in the literature, this research explored how public debt can relate to the persistence of accounting information. Public debt arises from a country's need to cover a budget deficit obtained by comparing a government's revenues and expenses (Chiappin et al., 2019), which deficit can generate negative impacts on the economy in case of loss of control (Leismann & Antonovz, 2016), and which can lead to a loss of confidence on the part of investors in the financial market. Consequently, the loss of confidence can cause a flight of capital, which can harm the maintenance of companies' operational and financing activities, increasing the instability of operations. In this sense, it is expected that:

H_6: The higher the public debt, the lower the persistence of accounting information.

3 Method

Financial data from consolidated financial statements and fiscal years ending on December 31 were collected from the Thomson Reuters® database to test the study's hypotheses. Additionally, macroeconomic data from 42 countries as of December 31 were sourced from The World Bank database; this resulted in a sample averaging 30,878 companies per year from 2008 to 2021, totaling 432,290 observations. The countries and periods were

selected based on the data available in the Thomson Reuters® database at the time of collection in April 2022. Table 1 details the number of companies analyzed each year and from each country and the total observations per country, per year, and overall for the study sample.

Table 1
Study Sample

Country/Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Mean	Total
Slovak R.	4	5	7	8	8	8	8	9	10	11	11	12	11	10	9	122
Latvia	8	8	8	8	8	8	9	9	9	11	11	11	11	11	9	130
Iceland	8	11	14	16	17	18	20	21	21	23	24	25	25	26	19	269
Estonia	16	17	18	19	20	20	20	21	20	20	19	21	21	23	20	275
Lithuania	19	19	20	21	21	21	22	25	27	28	29	30	30	30	24	342
Hungary	18	17	21	24	28	29	30	32	32	32	33	33	33	33	28	395
Portugal	39	38	39	39	40	40	40	40	42	43	44	47	47	47	42	585
Argentina	72	73	72	74	75	76	78	80	82	83	85	86	87	86	79	1109
Belgium	88	88	88	90	95	102	102	107	108	111	118	123	120	120	104	1460
Netherlands	76	77	81	83	94	99	107	109	115	120	120	128	132	135	105	1476
Romania	86	91	89	88	92	101	108	111	114	124	122	124	126	126	107	1502
New Zealand	88	91	93	96	101	111	114	119	123	128	130	133	135	138	114	1600
Finland	91	92	93	98	101	114	120	122	129	135	142	152	165	172	123	1726
Mexico	95	105	109	115	119	127	136	143	143	146	148	150	151	151	131	1838
Spain	98	102	102	105	115	124	130	142	157	176	195	225	241	246	154	2158
Greece	153	154	154	158	161	163	164	166	169	173	176	178	178	179	166	2326
Chile	146	146	151	157	163	168	171	175	176	177	178	180	181	180	168	2349
Norway	118	118	123	124	133	147	152	162	174	192	214	244	263	281	175	2445
Bulgaria	162	165	168	172	173	171	176	185	183	191	194	196	194	193	180	2523
Switzerland	193	193	201	204	208	214	219	228	236	243	251	256	261	264	227	3171
Italy	155	159	165	171	180	190	197	216	249	282	309	335	358	355	237	3321
Philippines	212	216	224	228	236	244	249	253	255	259	268	274	275	277	248	3470
Brazil	207	260	266	274	275	285	291	304	307	325	355	383	389	390	308	4311
Turkey	263	286	299	311	327	342	348	352	358	369	384	412	412	418	349	4881
Pakistan	258	266	278	296	313	335	342	353	384	443	470	472	471	322	357	5003
France	398	410	422	434	451	473	491	509	520	528	542	552	567	544	489	6841
Russia	364	402	423	447	468	505	526	541	547	555	557	552	552	554	500	6993
Sweden	281	294	302	319	348	381	419	506	592	656	709	768	803	831	515	7209
Germany	437	445	463	475	483	500	509	523	537	548	570	590	606	608	521	7294
Singapore	401	414	432	458	479	487	506	536	576	603	616	631	641	646	530	7426
Indonesia	384	404	425	451	476	490	506	534	588	663	724	772	800	810	573	8027
Thailand	485	510	532	559	595	626	662	703	735	772	820	843	857	860	683	9559
Malaysia	740	762	771	790	814	832	836	862	916	937	953	993	1012	1028	875	12246
United K.	906	928	936	971	1035	1087	1138	1174	1212	1271	1330	1426	1476	1492	1170	16382
Hong Kong	961	993	1013	1047	1113	1158	1233	1329	1432	1488	1512	1531	1534	1458	1272	17802
Australia	1034	1073	1130	1205	1259	1307	1371	1448	1510	1597	1707	1788	1841	1731	1429	20001
S. Korea	1325	1359	1385	1426	1479	1596	1705	1817	1910	2063	2192	2314	2398	2449	1816	25418
Canada	1469	1595	1669	1793	1938	2024	2119	2217	2336	2445	2580	2737	2885	3025	2202	30832
India	1902	1976	2036	2206	2529	2758	2919	3032	3144	3234	3388	3503	3556	3536	2837	39719
Japan	2912	2936	2986	3046	3111	3219	3322	3412	3518	3621	3725	3855	3975	4005	3403	47643
China	2315	2596	2751	2858	3059	3372	3832	4203	4388	4739	5310	5877	6084	6081	4105	57465
USA	3281	3426	3603	3808	4067	4317	4560	4862	5204	5517	5879	6340	3801	3981	4475	62646
Total	22268	23320	24162	25272	26807	28389	30007	31692	33288	35082	37144	39302	37705	37852	**30878**	**432290**

Source: Prepared by the Authors.

This sample was composed after excluding companies that did not have financial data in the Thomson Reuters® database (earnings, operating cash flow, and total assets) and companies from countries without macroeconomic measures disclosed in The World Bank database, as these data are required for use in econometric models. It is worth noting that the sample highlighted in Table 1 is the same for all models; that is, the same 432,290 observations were used in all econometric analyses.

Table 1 highlights that the data are not in a balanced panel since the number of companies analyzed each year differs. It was decided not to balance the panel to avoid losing

many observations. Thus, the models were estimated by ordinary least squares (OLS) with stacked data. Despite this, 13-time dummies and 41 country dummies were considered to control for the particularities existing in the data to reduce heterogeneity problems. Among these particularities, the adoption period of IFRS stands out since some companies had not yet adopted the international standards in 2008. Hence, the dummies control the effects of the changes in the normative standards for these countries.

Furthermore, to remove the effect of company size on the observations, the accounting variables earnings, cash flow, and accruals were divided by current assets, except for the models with the macroeconomic variable current GDP, which represents the total GDP of a country in a given year; this would result in measurement levels that are very different concerning the accounting measures. To better understand the empirical strategy of this study, Table 2 highlights the general models estimated.

Table 2

Econometric Models

Nº	Y	β_0	$\sum_{k=1}^{13} \beta_k$	$\sum_{n=14}^{54} \beta_n$	β_{55}	β_{58}	β_{56}	β_{57}	β_{58}
Base Persistence Models									
1 and 17	NI_{it}	Const.	$\Sigma year_k$	$\Sigma country_n$	$NI_{i_{t-1}}$				
2 and 18	NI_{it}	Const.	$\Sigma year_k$	$\Sigma country_n$	$OCF_{i_{t-1}}$	$Acc_{i_{t-1}}$			
3 and 19	OCF_{it}	Const.	$\Sigma year_k$	$\Sigma country_n$	$OCF_{i_{t-1}}$				
4 and 20	Acc_{it}	Const.	$\Sigma year_k$	$\Sigma country_n$	$Acc_{i_{t-1}}$				
General Representation of Persistence Models with Macroeconomic Variables (ME)									
5 to 16; and 21 to 36	NI_{it}	Const.	$\Sigma year_k$	$\Sigma country_n$	$NI_{i_{t-1}}$	$ME_{i_{t-1}}$	$NI_{i_{t-1}}*ME_{i_{t-1}}$		
	NI_{it}	Const.	$\Sigma year_k$	$\Sigma country_n$	$OCF_{i_{t-1}}$	$Acc_{i_{t-1}}$	$ME_{i_{t-1}}$	$OCF_{i_{t-1}}*ME_{i_{t-1}}$	$Acc_{i_{t-1}}*ME_{i_{t-1}}$
	OCF_{it}	Const.	$\Sigma year_k$	$\Sigma country_n$	$OCF_{i_{t-1}}$	$ME_{i_{t-1}}$	$OCF_{i_{t-1}}$	$OCF_{i_{t-1}}*ME_{i_{t-1}}$	
	Acc_{it}	Const.	$\Sigma year_k$	$\Sigma country_n$	$Acc_{i_{t-1}}$	$ME_{i_{t-1}}$	$Acc_{i_{t-1}}$	$Acc_{i_{t-1}}*ME_{i_{t-1}}$	

Note. NI = Net Income; AT = Total Assets; OCF = Operating Cash Flow; Acc = Income Accruals, measured by the difference between net income and operating cash flow; Const. = model constant; ME = macroeconomic variable, represented by the measures indicated in Table 3; Σyear = time dummies; Σcountry = dummies by country; t = current period; t-1 = previous period; i = company. Source: Prepared by the Authors.

In this study, four basic persistence models were used without considering macroeconomic variables, which were based on the models of Sloan (1996), Dechow and Schrand (2004), and Dechow et al. (2010). The four basic models were estimated twice, four with the accounting variables divided by the total assets of the current period (models 1 to 4) and another four without this standardization to serve as a basis for the results of the current GDP (models 17 to 20). Among these basic models, models 1 and 17 measure the persistence of current earnings (NI_t) concerning the earnings of the previous period (NI_{t-1}); models 2 and 18, the persistence of NI_t as a function of the operating cash flow and accruals of income, both lagged, which are the two components of NI_{t-1}; models 3 and 19, the persistence of current cash flow concerning the cash flow of the previous period; and 4 and 20, the persistence of the current period's income accruals as a function of the lagged Acc. In these models, persistent information is with positive and significant coefficients in the lagged variables (NI_{t-1}, OCF_{t-1}, and Acc_{t-1}).

Macroeconomic measures (ME) were inserted in the other models. Eight macroeconomic proxies were used, so another 32 models were estimated (4x8). The coefficients of the variables represented by the multiplications between the accounting information and the macroeconomic measures ($NI_{t-1}*ME_{t-1}$, $OCF_{t-1}*ME_{t-1}$, and $Acc_{t-1}*ME_{t-1}$) indicate whether persistence increases, decreases, or does not change according to the country's economic situation.

Table 3 shows each macroeconomic measure used in this study, the previous studies used as a basis, directly or indirectly, and the expected sign for the relationship between the macroeconomic variables and the accounting information.

Table 3
Macroeconomic Variables

Variable	Mensuration	Previous Studies	Signal
Inflation	The consumer price index measures the inflation rate and reflects the annual percentage change in the cost to the average consumer of purchasing a basket of goods and services annually.	Scholtens and Kang (2012); Liu et al. (2018)	-
Effective Interest Rate	The effective interest rate is the interest rate on the loan adjusted for inflation as measured by the GDP deflator.	Pimentel and Lima (2015)	-
GDP Growth	Annual percentage growth rate of GDP at market prices based on constant local currency.	Czajor et al. (2013)	+
GDP per Capita	GDP per capita is obtained by dividing gross domestic product by population, taking into account the number of inhabitants in mid-year.	-	+
Current GDP	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any taxes on products and minus any subsidies not included in the value of the products.	-	+
Exchange Rate	The exchange rate is calculated as an annual average based on monthly averages (local currency units relative to the US dollar).	Chang et. al (2013); Sari and Meliyant (2019)	-
Unemployment Rate	Unemployment refers to the share of the labor force that is out of work but available and seeking work.	-	-
Public Debt	Debt is the total stock of direct fixed-term government contractual obligations to third parties outstanding on a given date.	-	-

Source: Prepared by the Authors.

To verify the robustness of the models, the assumptions of normality of residuals (Chi^2), homoscedasticity of residuals (White's test), and multicollinearity between regressors (Variance Inflation Factor - VIF) were measured. In addition, outliers were identified using the interquartile range (IQR) method, in which the lower limit was determined from the quartile one minus three times the interquartile range (Q_{1-3}*IQR), and the upper limit from quartile 3 plus 3 times the IQR (Q_{3+3}*IQR). As per standard procedure in the literature, outliers were winsorized up to a limit of 1% of the lower and 1% of the upper extremes. No data were winsorized in variables without outliers.

For all models, the p-values of the Chi^2 and White tests were small (<0.0001), indicating that the models' residuals are not normally distributed and are heteroscedastic. The assumption of normality, however, can be relaxed in samples with many observations (the study has 432,290 observations) due to the asymptotic properties of the OLS estimators, according to the Central Limit Theorem (Wooldridge, 2012). Moreover, as a consequence of the heteroscedasticity of the residuals, the results were corrected by robust White standard errors, which adjust the t and F significance tests on the regression coefficients so that the calculated statistic is determined according to the heteroscedasticity of the residuals.

Finally, Gujarati and Porter (2011) explain that a VIF greater than 10 indicates multicollinearity problems. Of the 36 models, 8 had a VIF above 10 (models 9, 10, 11, 12, 25, 26, 27 and 28), representing the unemployment rate and GDP per capita analyses. The VIFs of the unemployment rate models were approximately 11 to 12, closer to the limit of 10, while the VIFs of the GDP per capita models were 17 to 20, further away from 10. Thus, these VIFs show preliminary signs of collinearity problems.

Gujarati and Porter (2011) explain that multicollinearity problems generate models with high R^2 and few significant coefficients in the t-test since there are increases in the confidence intervals. In these models, the opposite of what collinearity problems can generate occurs since

the R^2 was less than 50%, and almost all coefficients were significant. Thus, it is possible to infer that the VIFs above ten results from the interactive variables that the models have; that is, it is possible to consider that these variables measure additional effects. One factor that corroborates this is that the results of the current GDP, whose models did not have collinearity problems, are aligned with the results of the GDP per capita.

4 Results

4.1 Statistical analysis

The results are divided into five tables, with eight models in each. It is worth noting that all variables that are not the focus of analysis were omitted[1] from the tables, as it was impossible to condense everything into a small space without compromising the visualization and understanding of the results. Additionally, information regarding statistics is presented as an appendix[2] at the end of this study.

Initially, it was observed that all models were significant in the F test. The models with variables standardized by current assets had an approximate explanatory power of 40% for the persistence of current earnings as a function of lagged earnings, 43% for the persistence of current earnings concerning its lagged components, 45% for the persistence of operating cash flow only and 27% for the persistence of income accruals. The models with variables not divided by current assets had R^2 of 77%, 70%, 75%, and 51%, respectively.

Regarding the persistence of accounting information, earnings, cash flows, and accruals were persistent in all 40 models, with positive and significant coefficients at 1%. This consistency in the coefficients reinforces the robustness of the models since many changes in signs and significance when new variables are inserted are strong indications of bias. Table 4 highlights the four base persistence models standardized by total current assets and the four models with the macroeconomic variable inflation.

Table 4
Standardized Base Models and Models with Inflation

	Base Persistence Models				ME = Inflation			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	-0,16834	-0,15877	-0,05225	-0,12271	-0,18458	-0,17307	-0,06108	-0,12927
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
NI_{t-1}	0,64957				0,66955			
P-value	<0,0001***				<0,0001***			
NI_{-1}*ME_{t-1}					-0,01187			
P-value					0,0212**			
OCF_{t-1}		1,07299	0,66310			1,13191	0,70078	
P-value		<0,0001***	<0,0001***			<0,0001***	<0,0001***	
OCF_{t-1}*ME_{t-1}						-0,03231	-0,02122	
P-value						<0,0001***	<0,0001***	
Acc_{t-1}		0,55306		0,53457		0,56474		0,57481
P-value		<0,0001***		<0,0001***		<0,0001***		<0,0001***
Acc_{t-1}*ME_{t-1}						-0,00820		-0,02259
P-value						0,2345		<0,0001***
R^2 Adjusted	0,40123	0,42875	0,44713	0,26670	0,40177	0,42932	0,44830	0,26770
R^2	0,40131	0,42883	0,44720	0,26679	0,40185	0,42940	0,44837	0,26779
N	432290	432290	432290	432290	431181	431181	431181	431181
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
Largest VIF	1,033	1,569	1,033	1,033	4,019	4,56	3,457	3,55

[1] The results that include the omitted variables (macroeconomic) are presented in full in the tables listed in Appendix A, at the end of this study.

[2]Information regarding measures of central tendency (mean, minimum, and maximum) and dispersion (coefficient of variation and standard deviation) is presented in Appendix B, at the end of this study.

Control Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Regarding the first macroeconomic measure, Table 4, in models 5 to 8, shows that the higher the inflation, the lower the persistence of earnings, OCF, and Accruals. In model 5, the variable NI_{t-1}*ME_{t-1} was negative and significant at 5%, highlighting the reduction in the persistence of current earnings as a function of previous earnings. The measure OCF_{t-1}*ME_{t-1}, significant at 1% in model 6, highlights that the persistence of current earnings reduces only through lagged OCF. Models 7 and 8 highlight that the persistence of cash flow and current accruals reduces as a function of inflation. Thus, hypothesis 1 of the study is not rejected, which indicates that inflation is negatively related to the persistence of accounting information.

These results on the relationship between inflation and persistence show that from a financial perspective, these findings can contribute to adjusting earnings and credit risk forecasts in periods of high inflation. From a government perspective, the results are important because they contribute to implementing anti-inflationary policies intending to stabilize the economic environment. Finally, these results can contribute to better price and cost planning in the organizational segment to maintain persistent earnings margins in inflationary periods.

Table 5 below presents the results for GDP per capita and GDP growth.

Table 5
Models with GDP per capita and GDP growth

	ME = GDP per Capita				ME = GDP Growth			
	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Constant	0,03825	0,00571	0,03587	-0,00394	-0,18547	-0,17362	-0,06327	-0,13212
P-value	<0,0001***	0,5919	<0,0001***	0,5244	<0,0001***	<0,0001***	<0,0001***	<0,0001***
NI_{t-1}	0,46511				0,64348			
P-value	<0,0001***				<0,0001***			
NI_{t-1}*ME_{t-1}	0,000003				0,00333			
P-value	<0,0001***				0,1558			
OCF_{t-1}		0,76604	0,48535			1,08173	0,66610	
P-value		<0,0001***	<0,0001***			<0,0001***	<0,0001***	
OCF_{t-1}*ME_{t-1}		0,000005	0,000003			-0,00506	-0,00223	
P-value		<0,0001***	<0,0001***			0,2971	0,2532	
Acc_{t-1}		0,41610		0,23772		0,54379		0,53930
P-value		<0,0001***		<0,0001***		<0,0001***		<0,0001***
Acc_{t-1}*ME_{t-1}		0,000002		<0,0001***		0,00480		-0,00323
P-value		0,0003***		<0,0001***		0,2448		0,2752
R^2 Ajusted	0,40591	0,43211	0,45189	0,27567	0,40144	0,42888	0,44749	0,26691
R^2	0,40599	0,43219	0,45197	0,27577	0,40152	0,42895	0,44756	0,26700
N	432290	432290	432290	432290	432290	432290	432290	432290
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
Largest VIF	20,872	19,645	17,166	16,882	1,524	2,355	1,572	1,502
Control Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

In the analysis of GDP per capita and GDP growth in Table 5, an increase in the persistence of accounting information was observed only concerning GDP per capita. Since no previous studies used GDP per capita as a variable, it is possible to have a basis for the expected result from the triangulation of other results. Chen et al. (2020) observed that companies in regions with GDP growth lower than the national average are more likely to manage their earnings. Shen and Chih (2007) showed that the higher a country's GDP per capita, the less companies intend to smooth their earnings. In another direction, Khuong et al. (2022) found that earnings management (EM) through accruals has a negative relationship with earnings

persistence, and Kolozsvari and Macedo (2016) and Kajimoto et al. (2019) highlighted reductions and loss of persistence of accounting information for companies that smoothed their earnings. Thus, if the higher the GDP, the lower the earnings management and smoothing tend to be, and if they are negatively related to earnings persistence, it makes sense to find a positive relationship between GDP per capita and persistence.

From another perspective, in an argumentative and logical way, as it is a metric that measures the value of a country's GDP divided by the number of inhabitants, GDP per capita can reflect the average income of the population of a given region. In times of growth, it symbolizes that the population may have more purchasing power, which generates greater stability in the consumption of goods and services, which in turn potentially increases the revenues and earnings of companies, which then justifies the increase in the persistence of both earnings and cash flows and accruals.

As for the GDP growth measure, the non-significance of the variables NI_{t-1}*ME_{t-1}, OCF_{t-1}*ME_{t-1}, and Acc_{t-1}*ME_{t-1} in models 13 to 16 was unexpected. These results contradict the findings of Czajor et al. (2013), who found a positive relationship between earnings persistence and GDP growth, justified by the fact that countries with economic growth have a higher sales volume, which would consequently lead to an increase in persistence.

Table 6 highlights the other four basic persistence models without dividing by total current assets to serve as a comparison for the evidence of current GDP, which represents the country's total GDP. Thus, from a third perspective, the analysis of the current GDP (according to Table 6) aligns with the expected results; that is, the higher the current GDP, the greater the earnings persistence, OCF, and accruals. Thus, after analyzing the three representative measures of GDP, it is possible to state that hypothesis 2 is confirmed since a positive and significant relationship was found between GDP, per capita and current, and the persistence of accounting information in a scenario that is independent of the country's economic growth. In other words, the results indicate that companies from countries with high economic power have more persistent information, even if the economy is in decline, and companies from countries with low economic power have less persistent information, even if the economy is growing.

Table 6
Base Models without Standardization by Total Assets and Models with Current GDP

	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22	Model 23	Model 24
Constant	<0,0001	<0,0001	<0,0001	<-0,0001	<0,0001	<0,0001	<0,0001	<-0,0001
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
NI_{t-1}	0,79969				0,82455			
P-value	<0,0001***				<0,0001***			
NI_{t-1}*ME_{t-1}					<0,0001			
P-value					<0,0001***			
OCF_{t-1}		0,60726	0,80109			0,60618	0,80062	
P-value		<0,0001***	<0,0001***			<0,0001***	<0,0001***	
OCF_{t-1}*ME_{t-1}						< 0,0001	0,000003	
P-value						0,9324	0,0142**	
Acc_{t-1}		0,46064		0,60607		0,50131		0,55535
P-value		<0,0001***		<0,0001***		<0,0001***		<0,0001***
Acc_{t-1}*ME_{t-1}						< 0,0001		< 0,0001
P-value						< 0,0001***		< 0,0001***
R^2 Ajusted	0,77093	0,69920	0,75671	0,50961	0,77043	0,70105	0,75679	0,51185
R^2	0,77096	0,69923	0,75674	0,50967	0,77046	0,70109	0,75682	0,51192
N	432290	432290	432290	432290	432290	432290	432290	432290
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
Largest VIF	2,242	4,667	1,750	1,378	1,714	4,734	1,753	2,501
Control Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

It is worth noting that the results in Table 6 for current GDP are important to corroborate the explanation that the high VIF found for GDP per capita measures does not represent multicollinearity problems in the models.

Another point to highlight is the signs and significance of the coefficients of the persistence base models 17 to 20, in which the accounting information was not divided by the total current assets and which were generated for comparison purposes with models 21 to 24. It is possible to observe that even when disregarding the effect of the companies' size on the accounting information, they continue to be persistent, with significance at 1% in all situations.

From a financial perspective, these results on the relationship between GDP and persistence can contribute to users' assessment of the attractiveness of investments in countries with high GDP per capita. From a government perspective, the results are important because they encourage the development of policies that promote growth in GDP per capita. Finally, in the organizational segment, these results can contribute to expanding operations in regions with economic growth.

Table 7 shows the results with the effective interest rate and exchange rate variables.

Table 7
Models with the Effective Interest Rate and Exchange Rate

	ME = Effective Interest Rate				ME = Exchange Rate			
	Model 25	Model 26	Model 27	Model 28	Model 29	Model 30	Model 31	Model 32
Constant	-0,17559	-0,16253	-0,05590	-0,12617	-0,16760	-0,15795	-0,05186	-0,12240
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
NI_{t-1}	0,65740				0,65026			
P-value	<0,0001***				<0,0001***			
NI_{-1}*ME_{t-1}	-0,00392				-0,00004			
P-value	0,2360				<0,0001***			
OCF_{t-1}		1,0756	0,66795			1,07457	0,66361	
P-value		<0,0001***	<0,0001***			<0,0001***	<0,0001***	
OCF_{t-1}*ME_{t-1}		-0,00185	-0,00254			-0,00007	-0,00002	
P-value		0,7473	0,3164			<0,0001***	0,0003***	
Acc_{t-1}		0,56613		0,54182		0,55308		0,53536
P-value		<0,0001***		<0,0001***		<0,0001***		<0,0001***
Acc_{t-1}*ME_{t-1}		-0,00601		-0,00348		-0,00002		-0,00002
P-value		0,2586		0,2974		0,0002***		0,0001***
R^2 Ajusted	0,40135	0,42882	0,44725	0,26681	0,40152	0,42899	0,44729	0,26692
R^2	0,40143	0,42889	0,44732	0,26690	0,40160	0,42907	0,44736	0,26701
N	363578	363578	363578	363578	432290	432290	432290	432290
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
Largest VIF	2,599	3,450	2,342	2,562	1,187	1,579	1,239	1,201
Control Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

In Table 7, models 13 to 16 highlight that a country's effective interest rate is unrelated to earnings persistence, cash flows, and accruals. None of the interactive variables had significant coefficients. Thus, the prediction that the effective interest rate could be negatively related to the persistence of accounting information is not confirmed, i.e., hypothesis 3 is rejected.

The results contradict the findings of Pimentel and Lima (2015), who reported that high effective interest rates decrease earnings persistence since they can decrease the present value of future earnings. Thus, expectations about future earnings have less impact on current earnings innovation.

Among the factors that may contribute to the lack of a relationship between the effective interest rate and persistence, the following stand out: companies in the 42 countries used in this study may, on average, be less sensitive to effective interest rates since some sectors may have more stability in their demand and supply of products and services, which may result in greater financial stability and, consequently, lower debt and financial expenses; another point to be considered is the possibility that the effective interest rate of all the countries studied is, on average, balanced, which does not generate significant effects on the operations and finances of the companies. The study by Pimentel and Lima (2015) was carried out only in Brazil, in a period in which the effective interest rate went from approximately 50% in 1996 to 8% in 2013, which reflects a high variation in the effective interest rate, that is, the relationship found by Pimentel and Lima (2015) may be due to this high variation.

Table 7 also shows that the higher a country's exchange rate, the less persistent its earnings, cash flows, and accruals are since the coefficients of the variables NI_{t-1}*ME_{t-1}, OCF_{t-1}*ME_{t-1} and Acc_{t-1}*ME_{t-1} were all negative and significant at 1%; this indicates that current earnings persists less and less, the higher the exchange rate, and that operating cash flows and lagged accruals explain this lower persistence. The results also highlight that the higher the exchange rate, the less the current OCF persists as a function of the OCF of t-1, and the less the current Acct persists concerning the Acct of the previous period. Thus, the results align with the exchange rate predictions, according to hypothesis 4.

This evidence corroborates the arguments that accounting information would be less persistent in countries with a higher exchange rate. Chang et al. (2013) and Sari and Meliyant (2019) highlighted that companies tend to engage in earnings smoothing in high exchange rate scenarios. Kolozsvari and Macedo (2016) and Kajimoto et al. (2019) showed that smooth companies have less persistent accounting information than those that do not smooth.

One explanation for this negative relationship between the exchange rate and the persistence of earnings, cash flow, and accruals is that the exchange rate is an index that represents the value of a national currency concerning a foreign currency (BACEN, 2023). Therefore, an increase in this rate may mean a devaluation of the national currency (Rodrik, 2008). In this scenario, countries with high exchange rates have more difficulties importing products and offering tourist packages, which would cause an increase in costs for many entities and may affect the stability of earnings, cash flow, and accruals.

The results on the relationship between the exchange rate and persistence show that findings can contribute to the development of hedging strategies by companies, with a view to greater protection against exchange rate fluctuations, and contribute to the government by providing insights for the implementation of exchange rate policies to maintain the competitiveness of exports in an economy.

Finally, Table 8 shows the unemployment rate and public debt results.

Table 8

Models with the Unemployment Rate and Public Debt

	ME = Unemployment Rate				ME = Public Debt			
	Model 33	Model 34	Model 35	Model 36	Model 37	Model 38	Model 39	Model 40
Constant	-0,08718	-0,09271	-0,01804	-0,07778	-0,43376	-0,37005	-0,16297	-0,29773
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
NI_{t-1}	0,67640				0,50214			
P-value	<0,0001***				<0,0001***			
NI_{t-1}*ME_{t-1}	-0,00487				0,00188			
P-value	0,0945*				<0,0001***			
OCF_{t-1}		1,01696	0,62158			0,95818	0,58290	
P-value		<0,0001***	<0,0001***			<0,0001***	<0,0001***	
OCF_{t-1}*ME_{t-1}		0,00868	0,00633			0,00137	0,00102	
P-value		0,1543	0,0081***			0,0001***	<0,0001***	
Acc_{t-1}		0,61930		0,53953		0,34729		0,29370

P-value		<0,0001***		<0,0001***		<0,0001***		<0,0001***
Acc_{t-1}*ME_{t-1}		-0,01131		-0,00125		0,00270		0,00314
P-value		0,0337**		0,6796		<0,0001***		<0,0001***
R^2 Ajusted	0,40225	0,42941	0,44837	0,26778	0,40542	0,43239	0,44927	0,27726
R^2	0,40233	0,42949	0,44844	0,26788	0,40550	0,43246	0,44934	0,27736
N	394871	394871	394871	394871	312175	312175	312175	312175
P-value	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***	<0,0001***
Largest VIF	12,129	15,400	11,161	11,474	8,17	8,69	8,203	8,158
Control Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Regarding the unemployment rate, it was observed that the higher a country's unemployment rate, the lower the persistence of current earnings relative to the earnings of the previous period since the coefficient of the variable NI_{t-1}*ME_{t-1} was negative and significant at 10% in model 33. Caution is needed when analyzing this result since the p-value was 0.0945 and is almost insignificant.

When observing the results of model 34, which regresses current earnings as a function of their lagged components, it is observed that the variable Acc_{t-1}*ME_{t-1} was negative and significant at 5%, with a p-value of 0.0337, which provides more confidence in stating that earnings persistence reduces through accruals, the higher the unemployment rate. It is also noteworthy, in model 34, that the variable OCF_{t-1}*ME_{t-1} was not significant; that is, earnings persistence as a function of the lagged OCF does not change; this justifies the p-value of 0.0945 in model 9 since only one of the two components of earnings (accruals) changed as a function of the unemployment rate. Another result that reinforces the loss of earnings persistence as a function of accruals is the loss of persistence of current accruals, as indicated in model 36 (Acc_{t-1}*ME_{t-1}).

Model 35, however, highlights an unexpected result: the increase in the persistence of companies' current operating cash flow when a country's unemployment rate increases; this result was not predicted in the study since the proposed argument indicated that the higher the unemployment, the lower the persistence of accounting information. Therefore, the prediction that the unemployment rate could be negatively related to the persistence of accounting information is not confirmed; hypothesis 5 is rejected.

This evidence indicates a trade-off between the OCF and accruals depending on a country's unemployment level. Perhaps this result represents a possible change in a population's consumption pattern due to unemployment since income tends to decrease as unemployment increases, impacting consumption (Barbosa & Nogueira, 2018). It is known that financial institutions use people's scores to decide whether to grant credit. Thus, logically, the more unemployed a country has, the lower people's scores and the less credit they have available for consumption. For example, Freitas et al. (2017) found that in Brazil, the higher the unemployment rate, the lower the volume of credit generated by financial institutions; this, therefore, generates less consumption in credit, which justifies the reduction in the persistence of earnings through accruals and the decrease in the persistence of accruals themselves. Thus, the increase in the persistence of cash flows may be a consequence of this reduction in installment purchases since there is less credit in the market, which leads people to consume more in cash, or at least consume in the short term, the values of which are converted into cash flow in the same period of purchase.

As for public debt, the results were different from what was expected. The expected result predicted that the persistence of accounting information decreases with the increase in public debt; however, the results of models 37 to 40 indicate that the persistence of earnings, OCFs, and accruals increases (NI_{t-1}*ME_{t-1}, NI_{t-1}*ME_{t-1}, and NI_{t-1}*ME_{t-1} positive and significant at 1%). This result may suggest that in governments with high public debt, companies are

encouraged to adopt more rigorous and transparent accounting practices to maintain the confidence of investors and creditors, which may result in greater persistence of accounting information. It may also reflect greater pressure from creditors and the financial market, which may lead to more efficient management by companies, reflected in greater consistency and persistence in earnings, OCFs, and accruals.

After a more in-depth analysis of the survey data, a correlation of 47.4% was observed between public debt and GDP per capita and 20% between public debt and current GDP (Pearson correlation), both significant at 1%, that is, the higher the GDP of a country in the sample, the higher its public debt. In this case, it seems that the largest countries, in terms of GDP, have more freedom to acquire debt to cover public spending without harming their economy. Reis (2022) highlights that it is important to measure GDP since government spending must align with the size of its economy. Thus, this acquired public debt may be boosting the economy in a kind of public financial leverage, as highlighted by DIEESE (2006), which reports that, when used appropriately, public debt can be used to leverage growth, in addition to financing government investments and spending, which justifies the increased persistence of accounting information.

4.2 Additional analysis

A sectoral analysis was carried out based on ten distinct segments classified in the Thomson Reuters database to provide a broader picture of the relationship between macroeconomic measures and the persistence of accounting information worldwide. The following sectors are analyzed: industry, cyclical consumption, basic materials, technology, financial, healthcare, non-cyclical consumption, real estate, energy, and utilities. Analyzing the quality of information by sector becomes important due to the distinct effects of accounting standards in different sectors (Souza et al., 2022).

Due to the number of sectors and persistence models, it was not feasible to demonstrate all the models. Therefore, it was decided to analyze the persistence of the current earnings (NI_t) concerning the earnings of the previous period (NI_{t-1}). The persistence model analyzed by sector will follow the same configuration as the models that analyze NI_t concerning NI_{t-1} through the interaction of NI_{t-1} with macroeconomic measures. Table 9 summarizes the results.

Table 9
Earnings Persistence Models vs. Macroeconomic Measures by Sector

Macro Environment (ME)		**INF**	**GPC**	**GGR**	**CGD**	**EIR**	**ER**	**UR**	**PD**
Sector	**Variables**	**NI_t**	**NI_t**	**NI_t**	**NI_t**	**NI_t**	**NI_t**	**NI_t**	**NI_t**
Industrials	NI_{t-1}	0,6716***	0,5218***	0,6416***	0,7898***	0,6546***	0,6438***	0,7006***	0,4998***
	NI_{t-1}*ME_{t-1}	-0,0178	0,2182**	-0,0005	0,0001***	-0,0063	-0,0001***	-0,0106	0,0019***
Consumer Cyclicals	NI_{t-1}	0,7035***	0,5002***	0,6401***	0,8145***	0,6304***	0,6527***	0,6933***	0,5825***
	NI_{t-1}*ME_{t-1}	-0,0290**	0,2773**	0,0057	<0,0001*	0,0108	-0,0001***	-0,0077	0,0009**
Basic Materials	NI_{t-1}	0,6450***	0,5451***	0,6340***	0,8361***	0,6249***	0,6540***	0,6410***	0,5569***
	NI_{t-1}*ME_{t-1}	0,0038	0,0001*	0,0137**	<0,0001	0,0126	-0,0003***	0,0017	0,0012***
Technology	NI_{t-1}	0,6584***	0,3093***	0,6581***	0,7936***	0,7202***	0,6717***	0,7849***	0,4334***
	NI_{t-1}*ME_{t-1}	0,0067	0,0001***	0,0084	0,0001***	-0,0219**	-0,0005**	-0,0192**	0,0030***
Financials	NI_{t-1}	0,6592***	0,348***	0,6375***	0,7504***	0,6443***	0,6418***	0,6323***	0,4534***
	NI_{t-1}*ME_{t-1}	-0,0102	0,0001***	0,0022	0,0001***	-0,0021	-0,0003	0,0008	0,0023***
Healthcare	NI_{t-1}	0,6421***	0,5059***	0,6488***	0,7740***	0,7076***	0,6727***	0,7735***	0,5760***
	NI_{t-1}*ME_{t-1}	0,0185	0,0001*	0,0143**	<0,0001	-0,0155	-0,0002	-0,0173**	0,0011*
Consumer Non-Cyclicals	NI_{t-1}	0,6958***	0,3878***	0,3828***	0,8265***	0,6307***	0,5905***	0,4812***	0,4128***
	NI_{t-1}*ME_{t-1}	-0,0573***	0,0001**	0,0001**	<0,0001	-0,0193**	-0,0003	0,0182	0,0024***
Real Estate	NI_{t-1}	0,6907***	0,4290***	0,6562***	0,7864***	0,7030***	0,6282***	0,5862***	0,4283***
	NI_{t-1}*ME_{t-1}	-0,0367**	0,0001**	-0,0199**	<0,0001	-0,0369**	-0,0005***	0,0061	0,0025***
Energy	NI_{t-1}	0,6603***	0,4239***	0,6479***	0,7797***	0,6527***	0,6617***	0,6833***	0,4198***
	NI_{t-1}*ME_{t-1}	0,0005	0,0001**	0,01142	<0,0001*	0,0042	0,0001	−0,0036	0,0029***

Utilities	NI_{t-1}	0,7081***	0,8176***	0,6047***	0,7707***	0,5691***	0,5974***	0,6163***	0,5550***
	NI_{t-1}*ME_{t-1}	−0,0569	−0,0001	−0,0037	<0,0001	0,0128	−0,0001	−0,0036	0,0005

INF = Inflation; GPC = GDP per Capita; GGR = GDP Growth; CGD = Current GDP; EIR = Effective Interest Rate; ER = Exchange Rate; UR = Unemployment Rate; PD = Public Debt.

Note: Numerical values represent the coefficients of the variables; * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Yellow, blue, and green represent the considerable interactions at the 10%, 5%, and 1% levels, respectively. Source: Survey Data, 2024.

The results shown in Table 9 demonstrate that earnings are persistent in all sectors, at a significance level of 1%, corroborating the overall results in all models previously analyzed. Therefore, when analyzing specific sectors, the findings corroborate the study by Rosita and Srimindarti (2023), highlighting that operational and investment decisions taken in the current period can contribute to earnings sustained in future periods.

Regarding sectoral analyses, it is observed that Inflation (INF) negatively affects the persistence of earnings only in the sectors of cyclical consumption, basic materials, non-cyclical consumption, and real estate. The GDP per Capita (GPC) variable positively affects all sectors except utilities. Current GDP (CGD) has a positive relationship with the persistence of earnings in industry sectors, such as cyclical consumption, technology, finance, and energy.

The Effective Interest Rate (EIR) measure negatively affects the persistence of earnings in companies in the technology and real estate sectors only. The Exchange Rate (ER) has this negative relationship in the industry, consumer goods, basic materials, technology, and healthcare sectors. Conversely, the unemployment rate negatively affects earnings persistence only in the technology and healthcare sectors.

Finally, Public Debt (PD) positively affects the persistence of companies' earnings in all sectors, distinguishing itself only in terms of significance in two. Additionally, it is worth noting that GDP Growth (GGR) represents a measure that has a positive relationship with the persistence of the basic materials, healthcare, and non-cyclical consumption sectors. However, the real estate segment was the only one that presented a negative relationship with GDP, thus demonstrating that this sector, in particular, presents aspects that are distinct from the other sectors by reacting negatively to GDP growth in an economy.

The results presented are specific to this study and exploratory based on the global results presented and discussed in the previous section. These findings are expected to contribute to further discussions of the macroeconomic effects on global information quality and specific sectors.

5 Final Considerations

This study aimed to verify the relationship between macroeconomic measures and the persistence of accounting information in companies listed on international stock exchanges. The macroeconomic environment was represented by inflation, GDP, effective interest rate, exchange rate, unemployment level, and public debt. Data was collected to analyze the relationship between the macroeconomic environment and the persistence of accounting information, constituting a sample with 432,290 observations, referring to 42 countries, with data from 2008 to 2021.

The results found through regressions showed that the persistence of accounting information is negatively related to inflation, exchange rate, and unemployment rate (except cash flow persistence for the latter), that it is positively associated with public debt and GDP (except when measured by GDP growth, which was not significant), and that the effective interest rate does not impact it.

The results obtained in this study are relevant to the various information users since they provide a specific analysis of the quality of accounting information of companies listed on international stock exchanges in different economic scenarios. Through this research, it is

possible to understand how such information behaves and adapts within different economic contexts, contributing significantly to the general understanding of financial markets and their dynamics.

For investors, the study becomes important as it contributes to understanding this relationship since when allocating capital to a given company, it is expected that this investment will generate future returns. Therefore, it is valid to state that analyzing information quality from the persistence perspective in the most diverse economic scenarios makes investors feel more confident and secure in their decisions. Understanding how earnings behave in different economic scenarios can help investors optimize strategies and reduce potential risks.

Regarding creditors, this is another group of information users that this study can help with since understanding how the persistence of accounting earnings occurs in the most diverse economic scenarios is important information for granting credit. It is necessary to know whether the debtor can pay, a capacity that can be impacted differently depending on the economic scenario. Thus, this study can help creditors make the best credit decisions, reducing the chances of default and encouraging credit granting to companies that can honor their financial obligations.

For auditors, the results regarding the relationship between earnings persistence and the macroeconomic environment are useful because they provide a more comprehensive analysis of information quality in different economic contexts, which allows auditors to have more precise guidance regarding which scenarios would require more attention at the time of an audit, in addition to allowing them to adopt more careful approaches in the audit processes in certain scenarios, to identify possible manipulations and irregularities. It is, therefore, clear that this study can help auditors improve the efficiency and effectiveness of their audit processes, which ensures greater reliability and integrity of the financial statements of the companies under their responsibility.

A broader perception regarding the quality of accounting information in certain economic scenarios would make this work useful to regulators. This analysis lets regulators understand how managers use accounting standards to prepare financial statements in specific economic scenarios. Therefore, it allows regulators to know which scenarios may require greater attention regarding the effective use of accounting practices, which would prepare them to identify possible fraud and irregularities.

This study is of great importance to the government, as it provides a comprehensive assessment of the effectiveness of its economic policies in maintaining a favorable economic environment for companies operating in its territory through the analysis of earnings persistence in different economic contexts, which allows the government to understand whether its policies contribute to an opportune environment for the growth and profitability of companies. Furthermore, given how economic scenarios impact earnings persistence, the study also provides the perception that more precise monitoring is necessary for specific economic scenarios, which may lead the government to allocate resources and reinforcements in its supervision and control activities, which in turn would reduce the risk of irregularities and increase transparency and integrity in companies' operations.

In general, these are practical implications for users of accounting information: for investors, the study can provide information that improves investment decisions, optimizing strategies and reducing risks; creditors can benefit from better-assessing credit risk, promoting safer concessions; auditors can improve accuracy in detecting irregularities in different economic scenarios; regulators can have a clearer view of the best application of standards according to the economic scenario; finally, for the government, the study allows them to evaluate the effectiveness of economic policies and allocate inspection resources more accurately, due to variations in the economic scenario.

The limitation found in this study was the lack of literature that aims to analyze and

understand how the quality of accounting information (with a greater focus on persistence) behaves in the face of the most diverse macroeconomic scenarios. It is also worth highlighting the absence of financial information from some companies in specific periods, which led to decreased observations. In addition, the study is limited to analyzing the relationship between the macroeconomic environment and only one attribute of informational quality, persistence.

As a suggestion for future research, it is proposed that work be carried out that seeks to analyze the relationship between the macroeconomic environment and other proxies of the quality of accounting information, such as management in its different methods and conservatism so that other analyses can be obtained of how the quality of accounting information behaves in different economic contexts.

References

Arruda, M. P., Vieira, C. A. M., Paulo, E. & Lucena, W. G. L. (2015). Análise do Conservadorismo e Persistência dos Resultados Contábeis das Instituições Financeiras Brasileiras. *Sociedade, Contabilidade e Gestão*, *10*(2). https://doi.org/10.21446/scg_ufrj.v10i2.13348

Banco Central do Brasil – BACEN. (2023). *Câmbio*. Recuperado em 27 de fevereiro de 2023, de https://www.bcb.gov.br/meubc/faqs/p/o-que-e-taxa-de-cambio

Baginski, S. P., Lorek, K. S., Willinger, G. L. & Branson, B. C. (1999). The Relationship Between Economic Characteristics and Alternative Annual Earnings Persistence Measures. *The Accounting Review*, *74*(1), 105–120. https://www.jstor.org/stable/248607

Barbosa, I. B., & Nogueira, D. R. (2018). Impacto dos indicadores macroeconômicos nos índices de rentabilidade das empresas brasileiras: Uma análise no setor alimentício de 2010 a 2016. *Revista de Administração, Contabilidade e Economia da FUNDACE,* 9(1), 31-46. https://doi.org/10.13059/racef.v9i1.502

Beatty, A., & Liao, S. Financial (2014). Accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics*, *58*(1), 339-383. https://doi.org/10.2139/ssrn.2346752

Blanchard, O. (2023). *Fiscal policy under low interest rates*. MIT press.

Chang, F. Y., Hsin, C. W. & Hou, S. R. S. (2013). A re-examination of exposure to exchange rate risk: The impact of earnings management and currency derivative usage. *Journal of Banking & Finance*, *37*(8), 3243-3257. https://doi.org/10.1016/j.jbankfin.2013.03.007

Chen, X., Cheng, Q., Hao, Y., & Liu, Q. (2020). GDP growth incentives and earnings management: evidence from China. *Review of Accounting Studies*, 25, 1002-1039. https://doi.org/10.1007/s11142-020-09547-8

Chiappin, J. R., Leister, C., & Junior, A. C. (2019). Da Gestão da Dívida pública e sua Engenharia Jurídica: Uma Introdução. In *Dívida Pública*, 15-44, Blucher.

Croitoru, L. (2023). How Inflation is a Policy Nowadays. *Transylvanian Review of Administrative Sciences*, 19(68), 5-19. https://doi.org/10.24193/tras.68E.1

Czajor, P., Michalak, J. & Michalak, H. W. (2013). Influence of Economy Growth on Earnings Quality of Listed Companies in Poland. *Social Sciences*, *4*(82). https://doi.org/10.5755/j01.ss.82.4.6602

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50(2–3), 344–401. https://doi.org/10.1016/j.jacceco.2010.09.001

Dechow, P. M., & Schrand, C. M. (2004). *Earnings quality.* The Research Foundation of CFA Institute. https://alitsaki.ir/wp-content/uploads/2019/08/Earnings-Quality.pdf

Departamento Intersindical de Estatística e Estudos Socioeconômicos – DIEESE. (2006). *Dez perguntas e respostas para entender a dívida pública brasileira*. http://www.dieese.org.br/notatecnica/notatecDividapublica.pdf

Dichev, I. D., Graham, J. R., Harvey, C. R. & Rajgopal, S. (2013). Earnings quality: Evidence from the field. *Journal of Accounting and Economics*, *56*(2–3), 1-33. https://doi.org/10.1016/j.jacceco.2013.05.004

Dupor, B. (2001). Investment and Interest Rate. *Policy. Journal of Economic Theory*, *98*(1), 85-113. https://doi.org/10.1006/jeth.2000.2765

Fagundes, F. M., Brugni, T. V., & Nossa, S. N. (2024). Habilidade gerencial e qualidade da informação contábil no Brasil. *Revista Catarinense da Ciência Contábil*, *23*, e3421-e3421. https://doi.org/10.16930/2237-766220243421

Frankel, R., & Litov, L. (2009). Earnings persistence. *Journal of Accounting and Economics*, *47*(1–2), 182-190. https://doi.org/10.1016/j.jacceco.2008.11.008

Freitas, R. R., Bernardo, R., Jr & Seydi, L. (2017). Efeitos do crédito como variável da inadimplência, inflação e *desemprego na economia brasileira. Revista Brasileira de Administração Científica*, *8*(1). https://doi.org/10.6008/SPC2179-684X.2017.001.0003

Gujarati, D. N., & Porter, D. C. (2011). *Econometria Básica*. 5. ed.

Hall, R. E., Sims, C. A., Modigliani, F., & Brainard, W. (1977). Investment, Interest Rates, and the Effects of Stabilization Policies. *Brookings Papers on Economic Activity***,** 1977(1), 61–121. https://doi.org/10.2307/2534257

Hanlon M. (2005). The Persistence and Pricing of Earnings, Accruals, and Cash Flows When Firms Have Large Book-Tax Differences. *The Accounting Review***,** *80*(1), 137–166. https://doi.org/10.2308/accr.2005.80.1.137

Kajimoto, C. G. K., Nakao, S. H., & da Costa Moraes, M. B. (2019). A suavização do lucro líquido e a persistência das contas de resultado nas empresas brasileiras de capital aberto. *Revista de Contabilidade e Organizações*, 13. https://doi.org/10.11606/issn.1982-6486.rco.2019.154173

Khuong, N. V., Abdul Rahman, A. A., Thuan, P. Q., Liem, N. T., Anh, L. H. T., Thuy, C. T. M., & Ly, H. T. N. (2022). Earnings Management, Board Composition and Earnings Persistence in Emerging Market. *Sustainability*, *14*(3), 1061. https://doi.org/10.3390/su14031061

Kolozsvari, A. C., & Macedo, M. A. D. S. (2016). Análise da influência da presença da suavização de resultados sobre a persistência dos lucros no mercado brasileiro. *Revista Contabilidade & Finanças*, 27, 306-319. https://doi.org/10.1590/1808-057x201602610

Leismann, E. L., & Antonovz, T. (2016). Dívida Pública Bruta e Líquida e os Repasses da União ao BNDES. *Revista Competitividade e Sustentabilidade*, *2*(2), 1–11. https://doi.org/10.48075/comsus.v2i2.13373

Lev, B. (1983). Some economic determinants of time-series properties of earnings. *Journal of accounting and economics*, 5, 31-48. https://doi.org/10.1016/0165-4101(83)90004-6

Liu, S. Y., Wu, P. C., & Huang, C. W. (2019) The threshold effect of monetary policy on earnings persistence. *Spanish Journal of Finance and Accounting*, 48(1), 68-86. https://doi.org/10.1080/02102412.2018.1461462

Martini, R. A., Jayme Junior, F. G., & Oliveira, A. M. H. C. de. (2013). O ambiente macroeconômico e o bem-estar social: uma revisão bibliográfica sobre relações e controvérsias. *Revista De Economia Contemporânea*, 17(2), 324–351. https://doi.org/10.1590/S1415-98482013000200006

Olamide, E., Ogujiuba, K., & Maredza, A. (2022). Exchange rate volatility, inflation and economic growth in developing countries: Panel data approach for SADC. *Economies*, 10(3), 67. https://doi.org/10.3390/economies10030067

Oliveira, J. C. T., & Frascaroli, B. F. (2014). Impactos do Fatores Macroeconômicos na Emissão de Ações na Bolsa de Valores. *Revista de Gestão, Finanças e Contabilidade*, 4(1), 30-51. http://atena.org.br/revista/ojs-2.2.3-08/index.php/RGFC/article/viewFile/2176/1915

Omar, J. H. D. (2008). Taxa de Juros: Comportamento, Determinação e Implicações para a

Economia Brasileira. *Revista de Economia Contemporânea*, 12(3), 463-490. https://doi.org/10.1590/S1415-98482008000300003

Organização Internacional do Trabalho (2011). *Beyond the measurement of unemployment and undererемployment:* The case for extending and amending labour market statistics. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_166604.pdf

Pandini, J., Stüpp, D. R., & Fabre, V. V. (2018). Análise do impacto das variáveis macroeconômicas no desempenho econômico-financeiro das empresas dos setores de Consumo Cíclico e Não Cíclico da BM&FBovespa. *Revista Catarinense Da Ciência Contábil, 17*(51). https://doi.org/10.16930/2237-7662/rccc.v17n51.2606

Passos, A. G., Maciel, M. A. C., Doria, M. R., Oliveira, R. B. & Russo, S. L. (2012) Análise estatística da evolução do produto interno bruto da indústria da construção civil brasileira utilizando regressão linear simples. *Revista GEINTEC, 2*(5), 505- 514. https://doi.org/10.7198/S2237-0722201200050007

Phelps, E. S. (1973). Inflation in the Theory of Public Finance. *The Swedish Journal of Economics*, *75*(1), 67–82. https://doi.org/10.2307/3439275

Pimentel, R. C., & Lima, I. S. (2015). Market reaction to annual earnings innovations and alternative time-series assumptions: evidence of the Brazilian market. *Revista De Contabilidade e Organizações*, *9*(25), 56-72. https://doi.org/10.11606/rco.v9i25.89534

Reis, R. (2022). Debt Revenue and the Sustainability of Public Debt. *Journal of Economic Perspectives*, *36*(4), 103-24. https://doi.org/10.1257/jep.36.4.103

Rosita, V. A., & Srimindarti, C. (2023). The effect of sales volatility, operating cash flow volatility and debt level on earnings persistence. *Jurnal Ekonomi*, *12*(01), 1565-1571.

Rodrik, D. (2008). The Real Exchange Rate and Economic Growth. *Brookings Papers on Economic Activity,* 2008(2), 365-412. https://doi.org/10.1353/eca.0.0020.

Sari, M. R., & Meliyanti, M. (2019). Exchanges Rates, Stock Prices and Earning Management: Empirical Evidence of Blue-Chip Companies in Southeast Asia. *Journal of Management and Business Review*, *16*(2), 208-222. https://doi.org/10.34149/jmbr.v16i2.164

Schipper, K., & Vincent, L. (2003). Earnings quality. *Accounting Horizons*, 17, 97-110. https://doi.org/10.2308/acch.2003.17.s-1.97

Scholtens, B., & Kang, F. C. (2012). Corporate Social Responsibility and Earnings Management: Evidence from Asian Economies. *Wiley Online Library*, *20*(2), 95-112. https://doi.org/10.1002/csr.1286

Serrano, F. (2010). Juros, câmbio e o sistema de metas de inflação no Brasil. *Brazilian Journal of Political Economy, 30*(1), 63–72. https://doi.org/10.1590/S0101-31572010000100004

Shen, C. H., & Chih, H. L. (2007). Earnings management and corporate governance in Asia's emerging markets. *Corporate Governance: An International Review*, 15(5), 999-1021. https://doi.org/10.1111/j.1467-8683.2007.00624.x

Sicsú, J. (2019). Governos Lula: a era do consumo? *Brazilian Journal of Political Economy*, *39*(1), 128–151. https://doi.org/10.1590/0101-35172019-2870

Sloan, R. G. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *Accounting Review,* 289-315. https://www.jstor.org/stable/248290

Souza, P. V. S. D., Gonçalves, R. D. S., & Silva, C. A. T. (2022). Impact of IFRS 15 on the quality of accruals and earnings management of Brazilian publicly held companies. *Revista Brasileira de Gestão de Negócios*, *24*, 675-691. https://doi.org/10.7819/rbgn.v24i4.4197

Trinh. T. H. (2017). A Primer on GDP and Economic Growth. *International Journal of Economic Research. 14*(5). https://serialsjournals.com/abstract/12983_2.pdf

Walker, M. (2013). How far can we trust earnings numbers? What research tells us about earnings management. *Accounting and Business Research*, 43(4), 445–481. https://doi.org/10.1080/00014788.2013.785823

Wooldridge, J. M. *lntroductory econometrics: a modem approach*. 5. ed.
Zylberstajn, H., & Balbinotto Neto, G. (1999). As teorias de desemprego e as políticas públicas de emprego. *Estudos Economicos*, *29*(1). https://www.revistas.usp.br/ee/article/view/117216

Appendix A – Complete Results with Macroeconomic Variables Omitted

Table 10

Complete Results – Macroeconomic Variable Inflation

Models	**Model 5**		**Model 6**		**Model 7**		**Model 8**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
Constant	-0,184589	<0,0001***	-0,173077	<0,0001***	-0,061081	<0,0001***	-0,129278	<0,0001***
Inflation $_{t-1}$	0,012927	<0,0001***	0,011056	<0,0001***	0,006882	<0,0001***	0,005954	<0,0001***
NI $_{t-1}$	0,669550	<0,0001***						
NI $_{t-1}$*Inflation$_{t-1}$	-0,011870	0,0212**						
OCF $_{t-1}$			1,131910	<0,0001***	0,700782	<0,0001***		
OCF $_{t-1}$*Inflation $_{t-1}$			-0,032316	<0,0001***	-0,021227	<0,0001***		
Acc $_{t-1}$			0,564745	<0,0001***			0,574812	<0,0001***
Acc$_{t-1}$*Inflation $_{t-1}$			-0,008208	0,2345			-0,022593	<0,0001***

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Table 11

Complete Results – Macroeconomic Variable GDP per Capita (GPC)

Models	**Model 9**		**Model 10**		**Model 11**		**Model 12**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
Constant	0,038259	0,0004***	0,005717	0,5919	0,035872	<0,0001***	-0,003942	0,5244
GPC$_{t-1}$	-0,000005	<0,0001***	-0,000004	<0,0001***	-0,000002	<0,0001***	-0,000003	<0,0001***
NI $_{t-1}$	0,465111	<0,0001***						
NI $_{t-1}$*GPC $_{t-1}$	0,000003	<0,0001***						
OCF $_{t-1}$			0,766048	<0,0001***	0,485353	<0,0001***		
OCF $_{t-1}$*GPC $_{t-1}$			0,000006	<0,0001***	0,000003	<0,0001***		
ACC $_{t-1}$			0,416106	<0,0001***			0,237726	<0,0001***
ACC $_{t-1}$*GPC $_{t-1}$			0,000002	0,0003***			0,000006	<0,0001***

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Table 12

Complete Results – Macroeconomic Variable GDP Growth (GGR)

Models	**Modelo 13**		**Modelo 14**		**Modelo 15**		**Modelo 16**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
Constant	-0,18547	<0,0001***	-0,17362	<0,0001***	-0,06327	<0,0001***	-0,13212	<0,0001***
GGR$_{t-1}$	0,006394	<0,0001***	0,005136	<0,0001***	0,003634	<0,0001***	0,002935	<0,0001***
NI $_{t-1}$	0,643480	<0,0001***						
NI1 $_{t-1}$*GGR $_{t-1}$	0,003332	0,1558						
OCF $_{t-1}$			1,081730	<0,0001***	0,666108	<0,0001***		
OCF $_{t-1}$*GGR $_{t-1}$			-0,005063	0,2971	-0,002233	0,2532		
Acc $_{t-1}$			0,543791	<0,0001			0,539305	<0,0001***
Acc $_{t-1}$*GGR $_{t-1}$			0,004806	0,2448***			-0,003235	0,1765

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Tabela 13

Complete Result – Macroeconomic Variable Current GDP (CGD)

Models	**Model 21**		**Model 22**		**Model 23**		**Model 24**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
Constant	0,000001	<0,0001***	0,000001	<0,0001***	0,000001	<0,0001***	-0,000001	<0,0001***
CGD$_{t-1}$	0,000000	0,2114	0,000000	<0,0001***	0,000001	<0,0001***	0,000000	<0,0001***
NI $_{t-1}$	0,824550	<0,0001***						
NI $_{t-1}$*CGD $_{t-1}$	0,000000	<0,0001***						
OCF $_{t-1}$			0,606187	<0,0001***	0,800620	<0,0001***		
OCF $_{t-1}$*CGD $_{t-1}$			0,000000	0,9324	0,000003	0,0142**		
Acc $_{t-1}$			0,501314	<0,0001***			0,555350	<0,0001***
Acc $_{t-1}$*CGD $_{t-1}$			0,000000	<0,0001***			0,000000	<0,0001***

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Appendix A – Complete Results with Macroeconomic Variables Omitted

Table 14

Complete Result – Macroeconomic Variable Effective Interest Rate (EIR)

Models	**Model 25**		**Model 26**		**Model 27**		**Model 28**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
Constant	-0,175597	<0,0001***	-0,162533	<0,0001***	-0,055907	<0,0001***	-0,126171	<0,0001***
EIR_{t-1}	0,004884	<0,0001***	0,002824	<0,0001***	0,002297	<0,0001***	0,002376	<0,0001***
NI_{t-1}	0,657403	<0,0001***						
$NI_{t-1}*EIR_{t-1}$	-0,003924	0,2360						
OCF_{t-1}			1,075600	<0,0001***	0,667957	<0,0001***		
$OCF_{t-1}*EIR_{t-1}$			-0,001853	0,7473	-0,002546	0,3164		
Acc_{t-1}			0,566132	<0,0001***			0,541820	<0,0001***
$Acc_{t-1}*EIR_{t-1}$			-0,006010	0,2586			-0,003487	0,2974

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Tabela 15

Complete Result – Macroeconomic Variable Exchange Rate (ER)

Models	**Modelo 29**		**Modelo 30**		**Modelo 31**		**Modelo 32**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
Constant	-0,167607	<0,0001***	-0,157954	<0,0001***	-0,051861	<0,0001***	-0,122401	<0,0001***
ER_{t-1}	0,000006	<0,0001***	0,000007	<0,0001***	0,000004	<0,0001***	0,000003	<0,0001***
NI_{t-1}	0,650260	<0,0001***						
$NI_{t-1}*ER_{t-1}$	-0,000041	<0,0001***						
OCF_{t-1}			1,074570	<0,0001***	0,663612	<0,0001***		
$OCF_{t-1}*ER_{t-1}$			-0,000078	<0,0001***	-0,000027	<0,0001***		
Acc_{t-1}			0,553080	<0,0001***			0,535365	<0,0001***
$Acc_{t-1}*ER_{t-1}$			-0,000026	0,0002***			-0,000026	0,0001***

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Table 16

Complete Result – Macroeconomic Variable Unemployment Rate (UR)

Models	**Model 33**		**Model 34**		**Model 35**		**Model 36**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
Constant	-0,087180	<0,0001***	-0,092718	<0,0001***	-0,018047	<0,0001***	-0,077786	<0,0001***
UR_{t-1}	-0,019318	<0,0001***	-0,015542	<0,0001***	-0,008403	<0,0001***	-0,010835	<0,0001***
NI_{t-1}	0,676405	<0,0001***						
$NI_{t-1}*UR_{t-1}$	-0,004876	0,0945*						
OCF_{t-1}			1,016960	<0,0001***	0,621581	<0,0001***		
$OCF_{t-1}*UR_{t-1}$			0,008685	0,1543	0,006335	0,0081***		
Acc_{t-1}			0,619304	<0,0001***			0,539531	<0,0001***
$Acc_{t-1}*UR_{t-1}$			-0,011317	0,0337**			-0,001252	0,6796

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Table 17

Complete Result – Macroeconomic Variable Public Debt (PD)

Models	**Model 37**		**Model 38**		**Model 39**		**Model 40**	
Variables	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
Constant	-0,433762	<0,0001***	-0,370054	<0,0001***	-0,162971	<0,0001***	-0,297737	<0,0001***
PD_{-1}	0,002266	<0,0001***	0,001859	<0,0001***	0,000897	<0,0001***	0,001574	<0,0001***
NI_{t-1}	0,502144	<0,0001***						
$NI_{t-1}*PD_{t-1}$	0,001886	<0,0001***						
OCF_{t-1}			0,958180	<0,0001***	0,582906	<0,0001***		
$OCF_{t-1}*PD_{t-1}$			0,001376	0,0001***	0,001029	<0,0001***		
Acc_{t-1}			0,347295	<0,0001***			0,293702	<0,0001***
$Acc_{t-1}*PD_{t-1}$			0,002702	<0,0001***			0,003147	<0,0001***

Note: * = significant at 10%; ** = significant at 5%; *** = significant at 1%. Source: Survey Data, 2024.

Appendix B – Descriptive Results of Variables

Table 18

Descriptive Statistics of the Study's Dependent and Independent Variables

Variables	Mean	Minimum	Maximum	CV	SD	N
NI_{at}	-0,2621	-12,3814	0,327	2,1701	1,4731	432290
OCF_{at}	-0,0804	-4,821	0,3734	0,3746	0,6121	432290
Acc_{at}	-0,1559	-6,7062	0,4598	0,6173	0,7857	432290
GDP per Capita	31341,28	837,63	102913,5	4,68	21625,66	432290
GDP Growth	2,7504	-9,5182	14,5197	13,2697	3,6427	432290
Inflation	2,5455	-1,7358	11,9893	6,2966	2,5093	431181
Effective Interest Rate	2,829	-11,6006	14,3364	7,5351	2,745	363578
Exchange Rate	295,4301	0,4808	11865,21	2251353	1500,45	432290
Unemployment Rate	5,3092	0,25	14,39	5,7011	2,3876	394871
Public Debt	84,9179	4,2295	252,5228	2889,0653	53,75	312175

Source: Survey Data, 2024.