Liquidity and Profitability in the Colombian Oil and Natural Gas Extraction Sector: Analysis 2011 - 2021

Jorge Ducuara Parales, William Niebles-Núñez, Yahilina Silveira Perez

Universidad de Sucre, Sincelejo
Email: jorge.ducuara@unisucre.edu.co

Abstract

The dynamics brought about by the adoption of the International Financial Reporting Standards have a direct impact on the various Colombian economic sectors; highlighting the Oil and Natural Gas Extraction sector as one of the most important in terms of wealth generation and exports of the nation. For this reason, the present study was directed in order to analyze the indicators of Liquidity and Profitability in the Colombian oil sector between 2011 and 2021. For the development of the study, a quantitative investigation is proposed with a documentary base where it is carried out an analysis of secondary sources from the Superintendence of Companies from which financial data of the Oil and Natural Gas Extraction sector in Colombia is taken, on which a descriptive processing is carried out and subsequently a correlational analysis between the liquidity and profitability indicators. The results show a level of correlation between the liquidity indicators, referring to the Current Ratio and Acid Test, and those of Profitability, Return on Total Assets, and Return on Equity. It is concluded that the correlation between these variables would be explained by the rates and sales volumes of said sector; which constantly carries out transactions of high sums of money accompanied by multiple policies and methods to ensure the transaction and thus not unbalance the receipt of income by the industry.

Keywords: Liquidity, Profitability, Oil Extraction Sector, Natural Gas, IFRS.

1. Introduction

Within international markets, it is highlighted that the energy sector is one of the most outstanding and that it generates higher levels of wealth and impacts within society and the environment (Tapias, Sandoval and Sánchez, 2018; Carrasco and del Río Cortina, 2021; Niebles-Nunez, Niebles-Nunez and Babylon, 2022). More specifically, hydrocarbons stand out not only for their great representation in terms of wealth generation, but also for the volatility that exists in the behavior of their market and the factors that affect its dynamics (Lajous, 2019). In this sense, it is mentioned that for the correct functioning of the transactions of this type of market with an important base of international trade, it is essential to have a standardized and easily

comparable information system between nations (Bellandi, 2021); facilitating the understanding of the reality in each of the contexts in this type of item whose volatility makes these indicators not only have a greater weight, but could significantly affect the prices and trends present in said markets (Mushjl and Al-Gherebawy, 2019).

This standardization process arises from the so-called International Financial Reporting Standards (Hameedi, Al-Fatlawi, Ali and Almagtome, 2021); which appear in order to achieve harmonization in the way financial information is presented between countries so that the information is more understandable for the revitalization of commercial processes at the international level (Vijai, 2018; Levanti, Pitulice and Ştefănescu, 2021). In the case of Colombia, it is important to mention that this standardization process has been characterized by its lack of agility compared to other countries, which for many years have been preparing the regulatory framework and the industry itself for this new way of presenting and understanding certain elements. In this way, the formal entry into IFRS would not take place until 2015, generating a very important impact within the various sectors of the economy (Rico-Bonilla, Montoya-Ocampo, Franco-Navarrete and Laverde-Sarmiento, 2020).

When highlighting the Oil and Natural Gas Extraction market, it is key to understand that in the case of Colombia it is largely represented by mixed organizations (with public-private participation); which must report directly to the state and to many actors abroad who require a form of presentation of financial information for the development of commercial alliances (Céspedes, 2022). Certainly, the non-standardization of this information can cause conflicts within the Oil and Natural Gas Extraction sector and promote possible speculation within the market (Ibanichuka and Asukwo, 2018).

Thus, after the entry and harmonization of financial information towards IFRS in Colombia, it has also had an impact on the financial indicators of all markets (Parales and Ramírez, 2021); including in the Oil and Natural Gas Extraction sector with its highly volatile and complex characteristics. Based on this, this article is developed with the aim of analyzing the Liquidity and Profitability indicators in the Colombian Oil and Natural Gas Extraction sector between 2011 and 2021.

2. Methodology

For the methodological approach of the study, a quantitative study is developed, since financial data is taken and processed using financial and statistical methods to determine the behavior of liquidity and profitability indicators in the sector under study. It should be mentioned that the research is of a documentary nature since secondary sources represented by the databases provided by the Superintendency of Companies (2022) are taken as bases for the process of collecting information for subsequent processing. The elements taken into consideration are made up of the financial statements of income statements and current condition status and Liquidity Indicators. In this sense, a correlational analysis between the variables of profitability and liquidity indicators is established through the SPSS software; where a Normality Test is applied and two hypotheses are taken as reference:

- Hypothesis: H0: There is no relationship.
- H1: There is a relationship.

In this sense, for the development of the analysis the following phases are shown:

- Phase 1. Consolidation of the Financial Statements of the Companies
- Phase 2. Analysis of Liquidity and Indebtedness indicators
- Phase 3. Relationship between liquidity with indebtedness and soundness

Below is a table to show the size of the sample considered in the investigation.

Table I: Sample size

Clasificación Industrial Internacional Uniforme Versión 4 A.C	2011	2.012	2.013	2.014	2.015	2016	2.017	2.018	2.019	2.020	TOTAL
Extracción de Petróleo y Gas Natural	117	117	112	89	43	68	62	62	54	74	798

Source: Own (2022)

3. Results

Phase 1. Consolidation of the Financial Statements of the Companies

Within phase one of the results analysis process, the statements of financial position of the Oil and Natural Gas Extraction sector between 2011 and 2020 are shown in the first instance:

Table II: Statement of Financial Situation

Activity	Accounts	2.011	2.012	2.013	2.014	2.015
Oil and Natural Gas Extraction	Debtors Clients	1.936.126.581	1.310.149.377	2.102.082.800	1.442.626.230	88.683.091
	Inventories	551.933.991	405.082.742	578.909.073	354.752.909	61.299.026
	Total Current Assets	6.356.959.966	4.902.780.028	6.719.389.718	7.028.045.405	1.155.045.104
	Total active	17.392.179.954	19.556.082.053	25.692.060.092	25.130.750.943	4.465.974.653
	Providers	1.976.253.041	2.023.011.206	2.157.535.436	2.394.546.065	143.211.850
	Current Liabilities	6.176.864.954	5.525.540.917	6.900.221.405	7.323.407.999	1.046.128.502
	Long Term Liabilities	1.069.632.133	1.698.653.703	2.232.757.135	2.720.893.364	164.179.064
	Total Liabilities	7.246.497.087	7.224.194.620	9.132.978.540	10.044.301.363	1.210.307.566
	Current financial obligations	177.487.144	233.322.573	145.571.106	371.217.808	7.188.161
	Long-term financial obligations	73.779.254	299.571.774	690.055.365	893.051.872	522.466
	Total Equity	10.145.682.867	12.331.887.433	16.559.081.552	15.086.449.580	3.255.667.087
	Capital	6.657.119.276	9.530.916.037	11.089.979.232	13.156.043.867	5.122.700.997
Activity	Accounts	2.016	2.017	2.018	2.019	2.020
Oil and Natural	Debtors Clients	389.985.651	274.302.719	350.139.497	411.729.445	426.079.735
	Inventories	34.032.319	15.626.007	146.116.502	6.692.599	14.983.977
	Total Current Assets	775.375.200	467.821.576	895.183.580	613.519.871	677.016.572

Gas Extraction	Total active	4.448.343.581	4.223.582.382	4.731.621.349	3.808.960.322	3.490.060.182
	Providers	467.460.148	328.131.123	430.841.592	381.339.732	416.568.119
	Current Liabilities	844.603.623	533.268.643	1.047.588.734	753.113.341	819.413.006
	Long Term Liabilities	695.645.444	611.278.435	1.038.761.472	1.032.483.631	945.043.203
	Total Liabilities	1.540.249.067	1.144.547.078	2.086.350.206	1.785.596.972	1.764.456.209
	Current financial obligations	10.069.999	10.258.881	29.419.700	12.616.465	40.748.282
	Long-term financial obligations	372.988.772	5.475.742	225.559.017	234.786.747	270.595.091
	Total Equity	2.908.094.514	3.079.035.304	2.645.271.143	2.023.363.350	1.725.603.973
	Capital	32.616.269	28.242.493	87.655.979	89.156.102	119.270.268

Source: Own (2022)

Looking at the table above, it is possible to understand how between 2011 and 2020 there is a decrease in current assets, going from 6,356,959,966 in 2011 to 677,016,572 in 2020; in turn, customer debtors also show a decrease in the period of time analyzed. Total liabilities, in turn, also show a decrease from 7,246,497,087 in 2011 to 1,764,456,209 in 2020. In the same way, equity also shows a significant decrease. In the same way, the results of the studied timeline are presented below:

Table III: Statement of income

	Activity	Accounts	2.011	2.012	2.013	2.014	2.015
Oil and Natural Gas Extraction		Operating Income	17.862.642.936	16.379.721.605	19.549.596.032	18.732.405.770	1.291.290.059
	Plus:	Sales cost	13.167.509.922	11.857.123.355	13.775.907.164	15.504.813.098	1.364.238.137
	Equal:	Gross Profit on Sales	4.695.133.014	4.522.598.250	5.773.688.868	3.227.592.672	-72.948.078
	Minus:	Administration Operating Expenses	1.270.013.213	1.513.585.730	1.742.772.770	2.202.422.915	373.701.257
	Minuss:	Sales Operating Expenses	95.741.265	24.042.579	122.506.971	58.754.365	1.650.167
	Equal:	Operational utility	3.329.378.536	2.984.969.941	3.908.409.127	966.415.392	-448.299.502
		Depreciation	785.385.322	922.709.929	1.408.202.804	1.607.041.938	30.340.874
		Amortization	1.250.599.201	1.738.123.063	2.175.319.796	2.719.214.888	184.304.939
		EBITDA	5.365.363.059	5.645.802.933	7.491.931.727	5.292.672.218	-233.653.689
	Plus:	Non-Operating Income	1.754.056.307	5.374.500.283	2.296.729.009	4.126.215.660	2.610.196.197
	Minus:	Non-operating expenses	1.859.244.744	5.298.597.919	2.382.951.802	4.293.735.619	2.554.727.252
	Equal:	Income Before Taxes	3.224.190.099	3.060.872.305	3.822.186.334	798.895.433	-392.830.557
	Minus:	Income Tax and Complementary	1.283.027.034	1.289.698.825	1.763.994.134	927.414.692	156.806.306
	Equal:	Profit or (Net Loss)	1.941.163.065	1.771.173.480	2.058.192.200	-128.519.259	-549.636.863
	Activity	Accounts	2.016	2.017	2.018	2.019	2.020
		Operating Income	620.341.437	752.065.346	1.642.426.073	1.260.257.078	1.002.380.761

	Minus:	Sales cost	371.885.246	817.434.102	2.050.762.057	1.415.413.845	962.654.369
	Equal:	Gross Profit on Sales	248.456.191	-65.368.756	-408.335.984	-155.156.767	39.726.392
	Minus:	Administration Operating Expenses	164.761.464	188.409.948	187.578.615	169.453.138	126.374.117
	Minus:	Sales Operating Expenses	1.870.535	606.799	0	0	465.016
	Equal:	Operational utility	81.824.192	-254.385.503	-595.914.599	-324.609.905	-87.112.741
		Depreciation	92.950.418	134.278.778	505.141.513	144.998.523	95.152.280
		Amortization	174.774.610	-120.106.725	-90.773.086	-179.611.382	8.039.539
		EBITDA	71.317.188	295.232.239	32.897.973	51.048.060	95.361.706
	Plus:	Non-Operating Income	112.102.956	147.309.109	109.520.867	60.279.912	46.040.922
	Minus:	Non-operating expenses	23.374.054	9.791.580	25.430.408	18.542.363	29.554.474
	Equal:	Income Before Taxes	17.664.370	-116.253.953	-697.967.901	-352.384.120	-67.346.431
	Minus:	Income Tax and Complementary	107.830.026	98.098.051	132.169.445	53.747.827	-4.357.813
	Equal:	Profit or (Net Loss)	-90.165.656	-214.352.004	-830.137.346	-406.131.947	-62.988.618

Source: Own (2022)

When reviewing the income statement timeline in 2011 and 2020 of the oil and natural gas sector, it is possible to observe how, in the first instance, as from 2015, there is a decrease in operating income, with 2016 being the year with the lowest present income of 620,341,437. in turn, since 2014 net losses have been reported within the sector studied, in 2020 said loss is significantly reduced.

Phase 2. Analysis of Liquidity and Profitability indicators

Table IV: Liquidity vs Profitability

Indicator Type	Liquidity		Profitability margins	
Indicator	Current Ratio	Acid test	Return on Total Assets	Return on Equity
2011	1,03	0,94	0,16	0,25
2012	0,89	0,81	0,06	0,11
2013	0,97	0,89	0,11	0,17
2014	0,96	0,91	-0,01	-0,01
2015	1,10	1,05	-0,02	-0,04
2016	0,92	0,88	-0,02	-0,03
2017	0,88	0,85	-0,05	-0,07
2018	0,85	0,72	-0,20	-0,27
2019	0,81	0,81	-0,09	-0,15
2020	0,83	0,81	-0,02	-0,03

Source: Own (2022)

The above table provides evidence within the Oil and Natural Gas Extraction sector in the period of time from 2011 to 2020 on the indicators of Liquidity of Current Ratio and Acid Test and those of profitability of Return on Total Assets and Return on Equity.

Phase 3. Relationship between liquidity with indebtedness and soundness

To perform a correlation analysis of variables, a Shapiro Wilk normality test is first performed, where the variables behave normally when P≥0.05. According to Pearson, the correlation is not considered significant when P≤0.05, since the hypothesis H0 would be confirmed, that is, it implies that there is no correlation between the variables.

Table V: Shapiro Wilk Normality Test and Pearson Significance

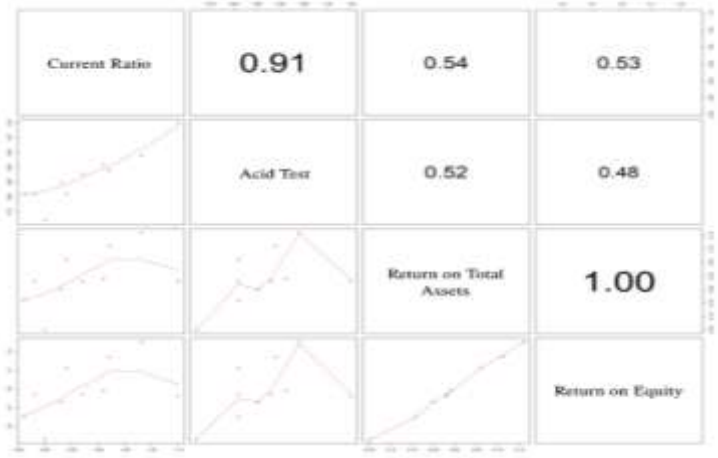
		*Normality Test P≥0,05
LIQUIDITY	Current Ratio	0,689
	Acid Test	0,769
PROFITABILITY MARGINS	Return on Total Assets	0,7144
	Return on Equity	0,8002

* Shapiro Wilk test, if P≥0.05 the variable behaves normally

Source: Own (2022)

Once the normality determination process has been carried out, a Pearson correlation study is carried out, whose findings show correlations between current ratios with return on total assets and return on equity and acid test with the aforementioned profitability indicators, as shown. observe in the following figure:

Figure I: Pearson conversions between indicators that are normally distributed two by two



With these correlations of indicators, we proceed to study the level of significance where the associations between the variables studied are observed in a positive way:

Table VI: Significance Test

		Return on Total Assets P≤0,05	Return on Equity P≤0,05
LIQUIDITY	Current Ratio	0,107	0,1163
	Acid Test	0,1212	0.1611

** Pearson's significance, If $p \leq 0.05$ Ho is rejected

Source: Own (2022)

4. Conclusions and discussion

In light of the results, and of the theory of financial analysis, there is no doubt that there is a correlation between the indicators of Liquidity (Current Ratio and Acid Test) and those of Profitability (Return on Total Assets, Return on Equity), every time Ortiz (2018) establishes that "financial costs are deducted from the profit from operating activities and cause net profit or loss to be finally reported" (p.304), this means that the decrease in the level of financial indebtedness of short-term and a higher level of the Current Ratio index and Acid Test is automatically generated, since as its model indicates "$\text{Liquidity} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$" (García, 2003) by having a lower Current Financial liability, (forming part of the denominator , makes the liquidity result, yields a higher quotient, consequence of a lower denominator, the above can conclude that a lower financial liability is closely related to higher net profitability and in turn a higher Liquidity Index.

On the other hand, when reviewing the Return on Assets and Equity Indicators, it is understood:

For the same reasons mentioned in the correlation between the Liquidity and Profitability Indicators, there is also a close correlation between Return on Equity and Liquidity, and Return on Assets and Liquidity. In the first comment of this paragraph, as there is greater profitability, it is due to a lower level of costs and expenses, which results in a better operating profit, than the result of subtracting Sales Costs from sales, thus obtaining GROSS PROFIT (in cash) and then subtract from this the Administration and Sales expenses (also not including Depreciation) generating as a result the value of EBITDA (García, 2018). Taking this Universal result that EBITDA, which by its English word means Earnings Before Interest, Taxes, Depreciation and Amortization (Earning Before Interest, Taxex, Depreciation and Amortization) that when interpreted is nothing other than the ability to generate liquidity with the development of the operation, so it automatically offers a close correlation between the Liquidity and Profitability Indicators.

When performing this analysis on the correlation between the Liquidity Indicator and the Equity Profitability, something similar happens, since increasing the Liquidity Index and comparing it with the Equity Profitability Indicator, this is "Calculated based on the Profit Neta" García (2003), as well:

$$\text{Return on Equity} = \frac{\text{Net profit}}{\text{Equity at the Beginning of the Period}}$$

The foregoing implies that, if the Net Profit is greater, as a consequence of a Liquidity indicator that allows carrying out the activity with ease and constant fresh resources to carry out a more profitable operation, with greater operating income, the numerator of the mathematical expression results in a higher Quotient as an immediate consequence, which implies a correlation between the Liquidity Index and the Return on Equity.

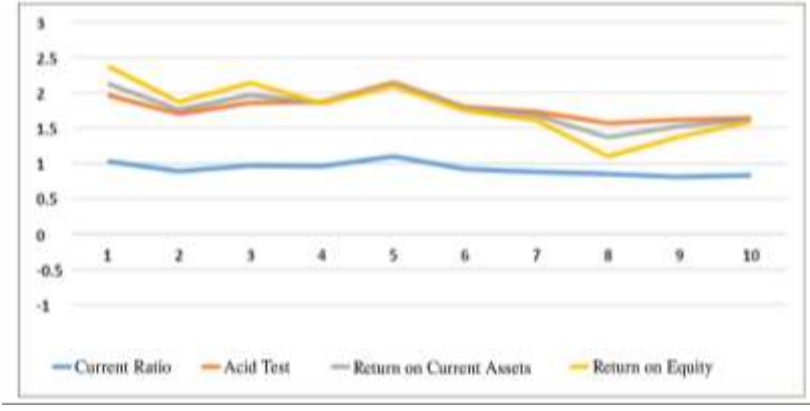
The same happens with the existing correlation between the Return on Assets, the dual is also calculated based on the Net Income:

$$\text{Return on Assets} = \frac{\text{Net Profit}}{\text{Active at Beginning of Period}}$$

In the same way, if the Net Profit is greater, as a result of a Liquidity indicator that allows carrying out the activity with ease and constant fresh resources to carry out a more profitable operation, with greater operating income, the numerator of the mathematical expression results in a higher Quotient as an immediate consequence, which implies a correlation between the Liquidity Index and the Return on Assets.

Similar behaviors occur with the acid test, since in this test only Current Assets are purged, subtracting the inventories to carry out the other calculations, that is, they are subtracted from current assets, due to slower liquidity possibilities, such as , the times of duration of the Raw Material in the Warehouse (Safety Stock) the conversion of the Raw Material and finally the times in which the product, once it is finished, is sold. The following is the graph that shows a close correlation of the variables Current Ratio, Acid Test, Return on Total Assets and Return on Equity of the companies belonging to the Extraction of Oil and Natural Gas.

Figure II: Correlation between Liquidity-Acid Test Vs Return on Assets and Return on Equity



When taking these results to the Oil and Natural Gas Extraction market, it is possible to recognize how these results agree with market practice; since it is characterized by its high liquidity of products and certainly an imbalance between the rotation of products and income can very

negatively affect the indicators within the sector (Gil-Alana and Monge, 2020). Certainly studying this specific sector and its trends is extremely complex since political and social variables enter into it as it is a product with such a volatile price within the market (Grigoli, Herman and Swiston, 2019; Vargas Restrepo and Saldarriaga Muñoz, 2020).

The investigative process carried out shows how the application of standardized financial processes allows a better understanding of a highly complex market and standardizes it with the reality present in other countries of the world (Cherga, 2022), so that the implementation of IFRS, although it causes without planning and preparation a lack of control in its early years due to the adaptation of the financial statements of companies to the regulations, are today a key tool for international trade (Doria, Alarcón & Hernández, 2018; Rivera, 2021).

WORKS CITED

Bellandi, F. (2021), Does Accounting Influence Finance? The Case of IFRS 9 and Fuel Hedging. International Journal of Business and Management, 16(12).

Carrasco, D. M., del Río Cortina, A. (2021), Equipo de gestión de reclamaciones contractuales como componente de gobernanza de los proyectos de infraestructura energética en Colombia. Informador técnico, 85(2), 230-245.

Céspedes, S., Cano, N. A., Foo, G., Jaramillo, D., Martinez, D., Gutiérrez, M., Franco, C. A. (2022), Technical and Environmental Feasibility Study of the Co-Production of Crude Oil and Electrical Energy from Geothermal Resources: First Field Trial in Colombia. Processes, 10(3), 568.

Cherga, T. (2022), Essence and role of international financial reporting standards (ifrs) in modern conditions. In Ştiinţă, educaţie, cultură , 1, 19-22.

Doria, D. D. F., Alarcón, H. A. G., Hernández, A. E. T. (2018), Estado actual de la implementación de las Normas Internacionales de Información Financieras (NIIF) en PyMEs de la ciudad de Montería, Colombia. FACES: Revista de la Facultad de Ciencias Económicas y Sociales, 24(51), 1-16.

García, S. (2003), Valoración de Empresas, Gerencia del Valor y EVA®. Digital Express Ltda.

Gil-Alana, L. A., Monge, M. (2020), Crude oil prices and COVID-19: Persistence of the shock. Energy Research Letters, 1(1), 13200.

Grigoli, F., Herman, A., Swiston, A. (2019), A crude shock: Explaining the short-run impact of the 2014–16 oil price decline across exporters. Energy Economics, 78, 481-493.

Hameedi, K. S., Al-Fatlawi, Q. A., Ali, M. N., Almagtome, A. H. (2021), Financial performance reporting, IFRS implementation, and accounting information: Evidence from Iraqi banking sector. The Journal of Asian Finance, Economics and Business, 8(3), 1083-1094.

Ibanichuka, E. A. L., Asukwo, I. S. (2018), International financial reporting standards adoption and financial performance of petroleum marketing entities in Nigeria. International Journal of Advanced Academic Research Accounting & Economic Development, 4(2), 1-15.

Lajous, A. (2019), Decline and recipients of Mexican crude oil exports. Foro internacional, 59(1), 189-259.

Levanti, D., Pitulice, I. C., Ştefănescu, A. (2021), Accounting harmonization measurement: the case of non-banking financial institutions in Romania. Accounting and Management Information Systems, 20(1), 111-131.

Mushjl, P. D. H. H., AL-Gherebawy, A. R. A. (2019), The Extent of possibility to which IFRS 6 is applicable in Iraqi crude oil production companies. Al Kut Journal of Economics Administrative Sciences, 1(34), 103-118.

Niebles-Nunez, W., Niebles-Nunez, L., Babilonia, L. H. (2022), Energy Financing in Colombia: A Bibliometric Review. International Journal of Energy Economics and Policy, 12(2), 459-466.

Ortiz, A. (2018), Análisis Financiero Aplicado Bajo NIIF. Universidad Externado de Colombia.

Parales, J. A. D., Ramírez, J. A. (2021), Análisis de indicadores de endeudamiento y solvencia enla convergencia a Normas Internacionales de Información Financiera (NIIF) en Colombia. Conocimiento global, 6(2), 89-102.

Rico Bonilla, C. O., Montoya Ocampo, L. D., Franco Navarrete, B. M., Laverde Sarmiento, M. Á. (2020), La comparabilidad de la información financiera en Colombia tras su convergencia con los IFRS. El caso de las propiedades, planta y equipo de las empresas cotizantes. Innovar, 30(76), 91-103.

Rivera, S. M. R. (2021), Efecto de las NIIF en los fondos de empleados de Colombia. Revista Reflexiones y Saberes, 1(14), 53-62.

Superintendencia de Sociedades. (2015), Consulta de Estados financieros bajo normas internacionales de información financiera (NIIF). Recuperado de: https://www.supersociedades.gov.co/delegatura_aec/estudios_financieros/Paginas/estados-financieros-historicos.aspx

Tapias, J. G., Sandoval, C. L., Sánchez, J. J. C. (2018), Análisis de prospectiva del sector energético de Colombia, para la integración de fuentes fotovoltaicas en los sistemas de distribución de energía eléctrica aplicando una revisión en bases de datos científicas. Revista Colombiana De Tecnologias De Avanzada (RCTA), 2(32), 109-119.

Vargas Restrepo, J. H., Saldarriaga Muñoz, J. P. (2020), Las exportaciones de hidrocarburos y el crecimiento económico en Colombia 1960-2016: un análisis según la hipótesis de la enfermedad holandesa. Apuntes del CENES, 39(70), 167-182.

Vijai, C. (2018), Convergence of International financial reporting standards (IFRS) with Indian perspectives: Issues and challenges. Journal of Commerce. Accounting and Finance Management, 1(2), 7-10.