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Do companies that generate profits make economic value added?

Robert Zenzerović

Abstract

This paper focuses on determining the differences between economic value added (EVA), net operating profit after tax (NOPAT), earnings before interest and taxes (EBITDA), and net income or loss for non-financial business entities operating in the Republic of Croatia in the period 2002–2021. The main objective of this paper is to determine whether non-financial activities create economic value added, and rank them according to selected indicators based on EVA. Research results indicate that there were only 27 out of 309 cases where EVA was positive, indicating that only the information and communication sector generated, on average, positive EVA during this twenty-year period. Positive EVA was generated in certain years in companies conducting human health and social work activities, education, mining, and quarrying, as well as in wholesale and retail trade activities, but the average EVA for this twenty-year period in these sectors was negative. At the same time, net income was achieved in 246 cases, and NOPAT in 285. Meanwhile, EBITDA was positive in all cases, demonstrating an obvious discrepancy between EVA and other financial performance measures. Correlation analysis results indicate that there is a statistically significant moderate correlation between EVA and net income/loss, although the correlation is generally stronger between EVA and EBITDA-based indicators. According to research results, the answer to the question in the title of this paper is negative, emphasizing the possibilities of intensive introduction of EVA as a financial performance indicator.

Keywords: economic value added (EVA), EVA per business entity, EVA/total assets, EVA/capital employed net income/loss, NOPAT, EBITDA, net income/loss

Introduction

Financial performance indicators had their beginnings in individual financial ratios which are calculated using the variables contained in financial statements. Their further development was based on the development of quantitative analysis techniques which were used to develop complex models that contained several non-financial, that is qualitative, variables. Recently, the emphasis in the reporting system has been placed intensively on non-financial variables that show the interaction of business entities with their surroundings as well as with the internal business environment. These include elements such as leadership, employee satisfaction, etc. Even though corporate social responsibility has become intensively analysed in the scientific community, the basic driving mechanism in the private sector remains the maximization of the wealth of entities involved in economic activities.

Economic value added is a contemporary measure of financial performance that shows the economic profit available to owners. It is a category that provides information on the residual profit above the costs of the sources of financing, and as such represents the extension of classic financial performance measures such as net operating profit after tax (NOPAT), earnings before interest, tax, amortization and depreciation (EBITDA), and the accounting result i.e. net income or loss. The purpose of this paper is to highlight the importance of economic value added (EVA) in relation to classical financial performance indicators using data from the population of non-financial business entities operating in the Republic of Croatia. The objective of this paper is to determine whether non-financial activities create economic value added and to rank them according to selected EVA-based indicators. The stated goal was realized by determining the average level of EVA per business entity and the indicators EVA/total assets and EVA/capital employed. In this way, the activities that have generated economic profit over the last

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twenty years, i.e. profit that exceeds the costs of others as well as companies' sources of financing, have been identified. According to the author's knowledge, it is the first time a ranking of non-financial activities in the Croatian economy has been conducted using EVA-based indicators. In this way, the activities that contribute to the creation of wealth for their owners above the required rate of return have been identified. At the same time, economic policyholders have a basis for identifying the most successful activities, but also the most problematic ones. This could be used as a starting point for taking corrective actions in activities of strategic interest.

EVA is an analytical tool that was commercially developed in 1982 by Joel Stern and G. Bennett Stewart as a result of several years of research started in the 1970s (Grant, 2003). The use of the total cost of financing dates back to the beginning of the twentieth century, and was first mentioned by the famous British economist Alfred Marshall. Just a few years later, EVA was first applied in economic practice by General Motors.

EVA is a measure of the dollar surplus value created by an investment or a portfolio of investments. It is computed as the product of the excess return made on an investment or investments and the capital invested in that investment or investments (Damodaran, 2012, p. 897).

Equations 1 and 2 show the calculation of EVA.

$$EVA = (ROI - WACC) \times CI \qquad (1)$$

$$EVA = (NOPAT - (WACC \times CI) \qquad (2)$$

where:
EVA = Economic value added
ROI = Return on capital invested
WACC = Weighted average cost of capital
CI = Capital invested represented by a sum of capital and reserves and financial liabilities
NOPAT = Net operating profit after taxes.

The weighted average cost of capital calculation is shown in Equation 3 (Dobrowolski et al., 2022).

$$WACC = \left(\frac{E}{V} \times \text{Re}\right) + \left(\frac{D}{V} \times Rd \times (1 - Tc)\right) \qquad (3)$$

where:
WACC = Weighted average cost of capital
E = Market value of the company's equity
D = Market value of the company's debt
Re = Cost of equity
Rd = Cost of debt
Tc = Corporate tax rate

EVA methodology is the one measure that properly accounts for all the complex trade-offs involved in creating value, and therefore the right measure to use for setting goals, evaluating performance, determining bonuses, communicating with investors,

and for capital budgeting and valuations of all sorts (Stewart, 1991, p. 136). It is used as a system of strategic planning, awarding system, and value-based management system, which directs the organizational behaviour of the company. Many companies use EVA to determine managerial bonuses and as a measure of financial performance. In 2010, state-owned companies in China introduced the EVA index for evaluating performance (the EVA index represents a combination of EVA and accounting profit with an EVA weighting of 40%). The introduction of the EVA index as a performance indicator resulted in an increase in the level of money in companies and a reduction in excessive investment activities (Shen et al., 2015). While the introduction of EVA as a performance measurement tool is generally considered consistent with mitigating agency costs and therefore increasing shareholder value, these same actions can also be associated with sub-optimal decisions (e.g., reducing investment in positive NPV projects to avoid the now explicit capital charge) (Wallace, 1997). Therefore, EVA needs to be viewed in a broader context along with other financial performance indicators, because managers may continue the practice of pitting their short-term goals against the long-term goals of the owners.

Although there are many benefits of EVA, it is still a financial performance measurement tool. The problem with these kinds of tools is that accounting earnings fail to measure changes in the economic value of the firm, and the reasons for this include (1) Alternative accounting methods may be employed: different methods for depreciation, inventory valuation, goodwill amortization, and so on; (2) Both business risk (determined by the nature of the firm's operations), and financial risk (determined by the relative proportions of debt and equity used to finance assets) are excluded; (3) Accrual-based accounting numbers differ from cash flows from operations; (4) Dividend policy is not considered; (5) The time value of money is ignored (Sabol & Sverer 2017, p. 21). Cinotti also emphasizes additional disadvantages of EVA, such as: (1) Ignoring investment in business continuity; (2) Ignoring the aspect of financial stability; (3) Excessive complexity and implementation problems; (4) Problems with determining the weighted average cost of capital, and (5) Focus on short-term objectives (Cinotti, 2023, p. 49).

The number of publications that dealt with EVA rose exponentially from 1995 to 2005, and over the last twenty years it has varied between 25 and 45 per year, except for the pandemic period, when the number of papers increased significantly (Tripathi et al., 2023). EVA-related research is emphasized more at universities in the US and China than in the rest of the world. The focus of EVA-related research is mostly related to accounting and management themes. Three broad themes emerged from an analysis of the cluster related to the use and application of EVA: residual income and valuation, financial performance, and performance management (Tripathi et al., 2023, p. 14). The approach used in this paper is focused on the

level of activities or sector that makes it challenging. Namely, most of the research is focused on a sample of companies which makes the calculations easier to perform and results more reliable.

Methodology

The data from the financial statements of all non-financial entities based in the Republic of Croatia in the period from 2002 to 2021 has been used to perform this research. The financial statements were collected from the Financial Agency, the body responsible for collecting data in the Republic of Croatia. The period covered was from the beginning of financial statements' systematic collection to the last available period. NOPAT, EBITDA, net income/loss total assets, and capital invested were calculated using the data collected. For the research, the data was aggregated at the level of each non-financial activity and the level of all non-financial activities, and thus the variables were calculated based on aggregated inputs. One of the central challenges in the research was the cost of capital estimation. The weighted average cost of capital was estimated by Damodaran using the data available (Damodaran, 2023a). In the first step, the data on the cost of capital across the sectors in the US economy was collected for each particular year from 2002 to 2021. It was assumed that the US had the lowest country risk according to the rating agencies' estimates. In the second step, the country risk premium for Croatia was added to each of the US sector's cost of capital estimating the Croatian costs of capital for a particular economic activity, i.e. sector. Risk premium rates were collected for each year from 2002 to 2021 using the available data from Damodaran (Damodaran, 2023b). The cost of capital for companies operating in the Republic of Croatia was estimated for each particular year for each sector included in the research (Appendix 1). The third step included the calculation of EVA, EVA per business entity, EVA/total assets and EVA/capital employed as well as their NOPAT, EBITDA and net income/loss counterparts. EVA was calculated using the Equation 2 formula and included the calculation of capital invested that comprised capital and reserves and financial liabilities.

According to the sectorial classification of institutional units, the non-financial sector includes institutional units whose distribution and financial transactions differ from those of their owners and which are market producers, and whose main activity is the production of goods and non-financial services. The group of non-financial entities includes all bodies recognized as independent legal entities, which, in addition to companies, also include cooperatives, non-profit institutions, and associations (Zenzerović et al., 2023, pp. 465–479). The data collected over a twenty-year period were structured into sixteen non-financial sectors according to national classifications of economic activities as follows: A – Agriculture, forestry and fishing, B – Mining and quarrying, C – Manufacturing, D – Electricity, gas, steam and air conditioning supply, E – Water supply, sewerage, waste management and remediation activities, F – Construction, G – Wholesale and retail trade; repair of motor vehicles and motorcycles, H – Transportation and storage, I – Accommodation and food service activities, J – Information and communication, L – Real estate activities, M – Professional, scientific and technical activities, N – Administrative and support service activities, P – Education, Q – Human health and social work activities and R – Arts, entertainment and recreation. Agriculture is an exception, as the period of analysis includes periods from 2013 to 2020, considering the unavailability of data for all years. Other service activities under section S were also not analysed due to the unavailability of data. The population of non-financial entities whose data was included in the analysis ranged from 61,674 in 2002 to 137,436 entities in 2021. In the twenty years of analysis, they employed between 745,000 and 920,000 employees, generating between 52 and 113 billion euros in revenues, and between 15 and 29 billion euros in value added. The analysis was conducted based on 309 cases, where one case represents the value for all companies in a particular year and a particular non-financial sector.

Descriptive statistics analysis, as well as correlation analysis, was conducted to draw appropriate conclusions on the relationships between EVA and other financial performance indicators, and explore the question asked in the title of the paper. At the end of the research, the correlations between EVA and other financial performance measures were tested. Because the Pearson correlation coefficient assumption related to outliers was disrupted, a more conservative approach was used and a non-parametric test was performed. Horvat and Mijoč (2019, p. 439) suggest that if the Pearson correlation assumptions are violated, another non-parametric test is recommended (ex. Spearman coefficient).

Results

Research results achieved among non-financial entities operating in the Republic of Croatia indicate that there were only 27 out of 309 analysed cases where EVA was positive, indicating that only the information and communication sector generated, on average, positive EVA over the twenty-year period. Positive EVA was generated in certain years in companies conducting human health and social work activities, education, mining, and quarrying, as well as in wholesale and retail trade activities, but the average EVA for the twenty-year period in these sectors was negative. At the same time, net income or accounting profit was achieved in 246 cases, NOPAT in 285, while EBITDA was positive in all cases, demonstrating an obvious discrepancy between EVA and other financial performance measures. If the analysis is focused only on the cumulative data for all non-financial activities, it is noted that the business entities do not generate EVA in any of the years analysed. At the same time, they

Table 1

Descriptive statistics for all non-financial activities in the period from 2002–2021 in euros

Variables	Minimum	Maximum	Mean	Std. Deviation
EVA_per_subject	–125.949	–28.256	–77.911	24.441
EVA_to_total assets	–0.0102	–0.0031	–0.0074	0.0018
EVA_to_capital employed	–0.0272	–0.0076	–0.0183	0.0055
NOPAT_per_subject	16.654	41.223	28.017	7.129
NOPAT_to_total assets	0.0014	0.0045	0.0027	0.0008
NOPAT_to_capital employed	0.0035	0.0111	0.0067	0.0020
EBITDA_per_subject	63.306	97.139	79.118	9.318
EBITDA_to_total assets	0.0058	0.0100	0.0077	0.0011
EBITDA_to_capital employed	0.0146	0.0248	0.0188	0.0028
NET_IN(LOSS)_per_subject	–3.816	40.219	20.792	12.598
NET_IN(LOSS)_to_total assets	–0.0003	0.0044	0.0021	0.0013
NET_IN(LOSS)_to_capital employed	–0.0009	0.0109	0.0049	0.0031

Source: author's own work.

generate positive NOPAT and EBITDA, while net loss was generated only in 2010 as a consequence of the delayed effect of the global economic crisis.

Table 1 shows the descriptive statistics for all non-financial activities. EVA measures are negative, with significant variations during this period. On average, the business entities operating in non-financial activities did not generate EVA for their shareholders. On average, they generated net income of 20,792 euros, NOPAT of 28,017 euros, and EBITDA of 79,118 euros.

Appendices 1, 2 and 3 show the descriptive statistics for business entities performing each of the sixteen non-financial activities. There are significant differences between average financial performance indicators among the activities. These results are expected according to the different levels of assets the business entities use, as well as the level of capitalization and sources of financing used. Differences among activities could be addressed by other factors specific to each of them, such as legislation, economic cycle, and many others.

In the next step, the activities were ranked according to each financial performance indicator analysed in the research. Rankings are shown in Table 2. In the twenty-year period, information and communication activities (J) had the highest EVA-based indicators, followed by human health and social work activities (Q) and education (P). These activities also had the best NOPAT-based indicators, which is expected, due to the fact that this indicator is used in EVA calculation. The NOPAT ratio per business entity is an exception, where electricity, gas, steam and air conditioning supply activities (D) and mining and quarrying (B) outperformed the other activities mostly due to the lower number of entities. Similar findings are related to EBITDA and net income (loss)-based ratios. Business entities operating in education scored low ratios of NOPAT per

subject and EBITDA per subject, but outperformed the other activities in the other two financial performance indicators based on NOPAT and EBITDA due to the low-value assets and capital employed. The lowest EVA-based ratios were achieved by accommodation and food service activities (I), real estate activities (L), construction (F), and water supply, sewerage, waste management and remediation activities (E). The lowest EVA per business entity was achieved in electricity, gas, steam and air conditioning supply activities, and this is due to central/local government ownership in most significant entities and consequently ineffective corporate governance. Similar findings apply for other financial performance indicators, except NOPAT per subject and EBITDA per subject, where the lowest score was achieved in education activities.

Research results that deal with correlations are shown in Appendices 5, 6, 7, and 8. Analysis performed on the population of all business entities operating in non-financial activities showed a positive correlation between EVA-based financial performance indicators and other ones, except correlations between performance indicators per business entity, which were not proven for any variable analysed. Correlations were statistically significant and the strongest between EVA to total assets and EBITDA to total assets, and could be estimated as strong as they outperformed the level of 0.7. EVA to capital employed had a strong correlation with EBITDA to total assets as well. Correlations between EVA and other indicators measured per unit of total assets and capital employed were moderate and varied between 0.469 and 0.686.

Correlations were calculated for each activity as well. The correlation coefficient varies significantly among activities, although significant correlation between EVA-based indicators and EBITDA to total assets and EBITDA to capital employed was identified in almost all of them.

Table 2

Non-financial activities ranking according to financial performance indicators

RANK	EVA_ per_subj	EVA_to_ TA	EVA_to_ CE	NOPAT_ per_subj	NOPAT_ to_TA	NOPAT_ to_CE	EBITDA_ per_subj	EBITDA_ to_TA	EBITDA_ to_CE	NET_IN_ L_per_ subj	NET_IN_ L_TA	NET_IN_ L_CE
1.	J	J	J	D	J	Q	D	J	P	D	J	P
2.	P	Q	Q	B	Q	P	B	Q	N	B	Q	Q
3.	Q	P	B	J	P	J	E	P	Q	J	P	J
4.	N	B	P	C	B	G	J	B	J	E	B	G
5.	G	G	C	E	R	B	C	R	B	C	M	B
6.	M	E	E	R	G	R	H	N	G	H	G	R
7.	R	C	R	A	C	N	R	C	R	R	C	M
8.	A	D	H	H	M	C	A	G	C	G	R	C
9.	C	R	A	G	A	A	F	H	D	M	D	D
10.	I	A	D	Q	D	M	I	M	L	Q	H	N
11.	B	N	G	F	N	D	G	D	H	P	N	E
12.	L	H	M	M	H	H	L	I	A	F	E	H
13.	H	M	F	I	I	L	Q	A	M	A	A	A
14.	F	L	I	L	F	I	N	E	E	N	F	F
15.	E	F	N	N	L	F	M	L	I	I	I	I
16.	D	I	L	P	E	E	P	F	F	L	L	L

Source: author's own work.

Discussion and conclusions

Do companies that generate profits make economic value added? If non-financial activities as a whole are analysed, the answer is negative. A broader analysis showed that there were some differences among the activities the companies performed. In only 27 out of 309 cases the sector generated positive EVA. The most successful activities were information and communication, which generated on average positive EVA over the twenty-year period. Companies conducting human health and social work activities, education, mining and quarrying, and wholesale and retail trade activities achieved an average positive EVA in particular years, but their average EVA over the twenty-year period was negative. Research results have proven that traditional financial performance measures like NOPAT, EBITDA and net income or loss should be broadened with EVA-based indicators when analysing the companies or sectors from the existing or potential investors' point of view. Inclusion of the cost of capital in EVA expands the basis for decision-making, allowing investors to detect above-average opportunities for investment. EVA-based indicators could be an appropriate tool that changes or expands existing management award systems, and decrease the possibility of manipulation of performance indicators. Research has specified benchmarking for using EVA-based indicators. Although the total value of EVA and EVA per subject should be considered carefully due to the fact that capital-intensive sectors use more assets, resulting in higher costs of capital and lower EVA, EVA to total assets and EVA to capital employed show the relative value of EVA per unit of assets or capital employed. These ratios expand traditional ratios allowing comparison across activities that can be useful for various stakeholders.

One limitation in the research was the cost of capital calculation approach, where the starting point was a cost of capital from the economy with different business and legal environments. Another limitation was a population of non-financial business entities which included information from unaudited financial statements as well as information from the non-profit sector (but not budget users). In future research, these limitations could be overcome by calculating costs of capital more precisely for each activity and by including only profit sector entities. The paper opened some new research questions, particularly relating to why some activities generate positive or negative EVA. Future research could be focused not only on the relations between EVA and different accounting-based performance measures, but also the strength of the impact of negative EVA on the market value of Croatian firms, investors' decision-making processes, and risk perception.

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Appendices are available in the online version of the journal.

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