

MULTIPLIERS BASED ON EBITDA AND DACF AS AN INDICATOR OF THE INVESTMENT ATTRACTIVENESS OF DOMESTIC VERTICALLY INTEGRATED OIL AND GAS COMPANIES

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Abstract

Subject. This article focuses on ratios of enterprise value to EBITDA and enterprise value to DACF of the twenty five leading publicly traded oil and gas companies within 2008 through 2018.

Objectives. The article aims to trace key trends in ratios of enterprise value to EBITDA and enterprise value to DACF of corporations in the oil and gas industry, as well as identify key trends in their change within the studied period and identify the factors that caused those changes.

Methods. For the study, I used the methods of comparative, financial and economic analyses, summarizing financial reporting data.

Results. The article finds that EV/EBITDA and EV/DACF multiples are acceptable for valuing oil and gas companies. The EV level depends on profitability, proved reserves and a country factor. It is required to adjust EBITDA for information on impairment, revaluation and write-off for assets that are reported separately from depreciation, depletion and amortization costs, as well as for income or expenses arising after the sale of fixed assets and as a result of effective court decisions or settlement agreements. It is advisable to adjust DACF for income, expenses and changes in assets and liabilities, which are caused by events that are unusual for oil and gas companies. Adjustment for interest payments can come to the fore in the DACF when the adjustment factor is significantly outside the standard range, and then it is better to limit to the EV/CF multiple.

Conclusions and Relevance. The application of EV/EBITDA and EV/DACF multiples requires a detailed analysis and if necessary, adjustments of their constituent components. However, they are quite relevant in the context of declining profitability and growing debt burden in the stock market sector of the global oil and gas industry. The findings can help appraise the value of oil and gas assets as part of a comparative approach and decide on actions for raising the market capitalization of publicly traded oil and gas corporations.

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Introduction

Domestic economists are characterized by an increased interest in the oil and gas sector, which is quite natural in view of the fact that this industry has been of great importance for the entire national economy of the country for many years. Thus, the products of the oil and gas sector are in the leading roles in the structure of industrial production and export of goods and, as a result, provide a significant part of the State budget revenues and form the country's stabilization fund. Oil and gas corporations together also form the basis of the entire stock market segment of the Russian economy.

The scientific community does not bypass in its works such an important aspect as the assessment of the value of various oil and gas assets. The authors pay attention to the common methods of income, cost and comparative approaches, identify the strengths and weaknesses of their use in relation to the oil and gas sector, and also assess the value of various industry assets. In this context, the method of the analogous company and the industry formulas method related to the comparative approach in assessing the cost are quite remarkable, which have received wide coverage in the domestic scientific literature [1].

The listed methods are based on the use of a variety of multipliers, including both widespread coefficients and indicators typical for the oil and gas sector. The generally accepted multipliers usually include those ratios that express the ratio of market capitalization or enterprise value, which differs from the previous indicator by the amount of net debt, to assets [2], revenue [3], net profit [4], EBITDA [5] and DACF [6]. And among the special multipliers, those coefficients are usually distinguished, where data on the production [7] and reserves [8] of crude oil and natural gas are used as constituent components in the structure.

It is worth noting that the ratio of the enterprise value (EV) to EBITDA ratio has become quite widespread within the framework of the comparative approach in the oil and gas industry among the indicated multipliers [9]. This ratio reflects the number of years that a potential investor may need for the EBITDA generated by the oil and gas corporation to reach the acquisition costs of the company itself. This indicator is quite naturally considered when analyzing the effectiveness of the use of special industry multipliers in comparison with universal multipliers [10]. This ratio is also affected when determining the optimal premium in mergers and acquisitions [11]. It is also important to emphasize that domestic authors are studying the features of the practical application of the designated multiplier for oil and gas companies with a high debt burden [12].

But the ratio of the enterprise value to EBITDA is also affected in those scientific works that relate to the assessment of the value of corporations in the industry rather indirectly. Thus, attention is paid to this multiplier in the strategic analysis of those factors that affect the development of oil and gas companies in Russia [13]. The indicator is also of interest in the comparative assessment of the efficiency of large industry corporations [14]. The

coefficient is also mentioned from the position of determining the influence of the capital structure on the value of companies, including those related to the oil and gas sector [15]. The desired multiplier is significant in the study of the features of the repurchase of shares [16], and also contributes to decision-making in the formation of the investment portfolio [17].

On the contrary, the scientific community almost does not use the ratio of the enterprise value (EV) to the net cash flow from the main activities of the oil and gas corporation, adjusted for debt (DACF) in its work on the subject of value assessment. Consequently, the DACF is the oil and gas corporation's net cash flow from operating activities, which is added to the interest expense adjusted for the ratio of income tax expense to pre-tax profit. This multiplier shows the number of years that a potential investor may need to make cash received from operating activities equal to the cost of acquiring a company. Therefore, it is not surprising that publicly traded oil and gas corporations include this indicator in their published analytical materials¹. It should be noted that the authors also use a rather close in meaning coefficient of the ratio of the market value of a share to the value of cash flow from the main activity [18], but the indicated multiplier is not widely used in practice.

It turns out that the Russian scientific community does not actually cover such a significant direction in assessing the cost by a comparative approach as the establishment of the level of multipliers on the basis of EBITDA and DACF that is typical for the entire stock market segment of the oil and gas industry. Consequently, the key trends and main reasons for the changes taking place in the oil and gas sector are not identified. But the implementation of this kind of research is a rather difficult task that requires the collection and subsequent processing of a very extensive array of data over a long period of time and on a fairly impressive number of industry companies. But only this approach provides the opportunity to obtain the most complete and most reliable idea of the situation that is developing in the industry in relation to the multipliers under study.

Methodology for compiling a list of the world's leading publicly traded oil and gas corporations

Of great importance in identifying the values of the multipliers characteristic of the stock market segment of the industry is the determination of the principles according to which the selection and inclusion of certain companies in the list of corporations studied in the following takes place. In this regard, it is necessary to highlight the fact that the most important indicator for any company whose shares are traded on the stock exchange is market capitalization. Therefore, the indicated characteristic is best used as a target benchmark for classifying a corporation as one of the leading publicly traded oil and gas companies. But the stock market segment of the world economy includes an impressive number of companies from various sectors of the national economy. Then, the availability of the tools themselves for the correct selection of corporations to the list of the world's

¹ Analyst's Handbook 2019. PJSC LUKOIL.

URL: <http://extraowa.lukoil.com/op/view.aspx?src=https://lukoil.ru/FileSystem/9/468449.xls>

leading publicly traded oil and gas companies for a long time period on the basis of reliable information sources becomes tangible, which ultimately will make it possible to track the transformation of the level of interest multipliers inherent in the stock market segment of the industry.

This approach to the analysis is in total consistent with the Financial Times Global 500² rating published up to 2015 and the still outgoing Forbes Global 2000³ list, which provides data on the market capitalization of the world's largest corporations. It is natural that corporations from these ratings should be included in the desired list of the world's leading publicly traded oil and gas companies. Although not all of them are suitable, but only those companies that relatively consistently fell into each of the ratings that existed at that time throughout the period covered by the research framework. The analysis revealed that twenty-five oil and gas companies quite satisfy the stated criterion.

The largest number of companies from the list obtained belong to the US oil and gas sector. These are the integrated corporations ExxonMobil and Chevron and the large independent companies ConocoPhillips, Occidental Petroleum, Devon Energy, Anadarko Petroleum, EOG Resources, Apache and Marathon Oil. And such an impressive number of US companies in the aggregate list is understandable due to the fact that many more companies with a high market capitalization are located there than in any other country in the world. The list also includes companies from Canada. These are the integrated corporations Imperial Oil, Suncor Energy and Husky Energy and the independent company Canadian Natural Resources. There is also one South American company, which is the Brazil-based integrated corporation Petrobras.

Western European countries are represented in the list by the highly integrated corporations Royal Dutch Shell, BP, TOTAL, Eni and Equinor. Companies from China are also present in it. This group includes the integrated corporations Sinopec and PetroChina and the independent company CNOOC. The list also includes companies from Russia. The largest integrated oil and gas corporations PJSC Gazprom, PJSC NK Rosneft and PJSC LUKOIL got there. In their sum, all the listed companies form the very list of the leading publicly traded oil and gas corporations, on the basis of which the values of the enterprise value to EBITDA and enterprise value to DCF multipliers typical for the stock market segment of the industry are then formed.

Dynamics of changes in EV/EBITDA and EV/DCF multiples of the leading publicly traded oil and gas companies

The EBITDA-based multiplier level, typical for the stock market segment of the oil and gas industry, slightly decreased over the period under review (*Table 1*), while the corresponding value of the DCF-based multiplier showed a certain growth (*Table 2*). It is noteworthy that the maximum value for both indicators exceeded the minimum values

² FT Global 500. URL: <http://im.ft-static.com/content/images/b38c350e-169d-11e5-b07f-00144feabdc0.xls>

³ Forbes Global 2000 URL: <http://www.forbes.com/global2000/list>

by less than three times in the covered time range. It turns out that the market valuation of oil and gas companies in the industry does not change in proportion to the transformation of EBITDA and DCAF. The very same level of average industry indicators varies in a relatively narrow range of values. This feature allows them to be used to assess the value of oil and gas companies even during periods of low oil prices, which were observed in the midst of the global financial crisis and during a rather protracted industry shock.

It is advisable to study the multiplier indicators for each of the companies in relation to individual countries or regions due to their rather impressive number, which greatly simplifies the identification and subsequent structuring of the specifics inherent in individual oil and gas corporations. Thus, the US oil and gas industry in favorable periods for raw materials prices is characterized by the absence of obvious differences between the EV/EBITDA and EV/DCAF values for independent companies and integrated corporations, despite significant differences in the structure of generated revenue. This feature is also confirmed by the data of the previously integrated corporations Marathon Oil and ConocoPhillips, which went through the procedure for withdrawing all refining assets from the business structure and turned into purely independent companies. Refining corporation Marathon Petroleum spun off from Marathon Oil in 2011, and its shares were freely traded on the stock exchange. And the ConocoPhillips refining segment was transformed into an independent publicly traded corporation Phillips 66 the following year. Such transformations did not lead to significant changes in the EV/EBITDA and EV/DCAF values of Marathon Oil and ConocoPhillips against the background of the dynamics of competitors in the US oil and gas industry.

The value of the studied indicators significantly increased during the crisis periods, and in some cases even passed into the negative range. Consequently, the sharp drop in prices affects the DCAF and especially EBITDA much more than the EV. The undoubted advantage of using EV in comparison with market capitalization is that the enterprise value indicator includes net debt, which makes it possible to somewhat neutralize the impact on the market valuation of attracted capital in the context of an increase in the importance of this component in the stock market segment of the oil and gas industry.

In addition to the debt burden, the profitability of an oil and gas company also has a significant impact on the level of market capitalization, and therefore on the value of EV. The impact of margins on multiples becomes more evident in favorable periods for the industry, when quotations remain high for a long time, due to the fact that a serious drop in DCAF and EBITDA indicators occurs while oil prices remain low for a long time. And a similar period in the oil and gas sector has been observed since 2010, at that time the industry began to recover from the consequences of the global financial crisis. And such prices for hydrocarbons lasted until the collapse of oil prices in 2014, which marked the beginning of a protracted crisis in the industry.

A good example in this case is the company Marathon Oil, for which both of the multipliers under study had very low values in the favorable period for the industry. It

should be noted that such results were characteristic of Marathon Oil both in the status of an integrated corporation and after transition to the category of independent companies. The key reason for this was the presence in the overall structure of Marathon Oil sales of a rather impressive component from the sale of synthetic oil. This type of oil is obtained from tar sands and belongs to unconventional resources for oil and gas companies. But the costs themselves, which arise in connection with the extraction of sand and the further production of oil from it, often significantly exceed the costs of developing traditional oil and natural gas fields per barrel of hydrocarbons. This circumstance did not have the best effect on the profitability of Marathon Oil (*Table 3*), which in turn had a negative effect on the EV indicator (*Table 4*). It all ended with the corporation selling in 2017 all of its assets related to the development of oil sands in Canada.

It is noteworthy that the independent companies Devon Energy and Anadarko Petroleum at times experienced a sharp drop in EBITDA (*Table 5*) even at high oil prices, which in turn influenced the value of the EV/EBITDA multiples of the designated corporations. Therefore, it is quite natural that the EV/EBITDA ratio of independent US companies grew much more than that of integrated corporations during periods of low oil prices. And the value of this indicator moved into the negative range of values for the independent companies Occidental Petroleum, Devon Energy, Anadarko Petroleum and EOG Resources. These results indicate that low oil prices are a more significant factor for independent companies that mainly sell or resell raw materials than for integrated corporations, most of which are dominated by refined products in the structure of revenues. The reason lies in the fact that prices for petroleum products do not change in proportion to quotations for oil. And there is a collapse in prices for raw materials during periods of crisis for the entire industry, which then remain at a low level for a long time. This situation leads to such indicators for independent US companies.

The decline in revenues during long periods of low oil prices is not the only thing that can have a significant impact on EBITDA. Also, such components of the income statement as impairment, revaluation and write-off of assets can also have a significant impact on the value of EBITDA (*Table 6*). These components are presented as separate components in the structure of financial statements, and therefore are taken into account when calculating EBITDA in its standard presentation. But this is not the case for all publicly traded companies in the industry. Some corporations include them in the cost of depreciation, depletion and amortization, which quite reasonably increased during the periods of the global financial and protracted industrial crises, when oil prices were at a low level for a long time.

A fairly striking example is Apache, whose depreciation, depletion and amortization costs reached USD 29,372 million at the height of the industry crisis in 2015, although they totaled only USD 10,158 million a year earlier. The bulk of these expenses was attributable to additional depreciation, depletion and amortization costs in the amount of USD 25,517 million, to which the company itself attributed a partial write-off based on the revaluation of the carrying amount of proved oil and gas reserves. But Apache did

report impairment costs of USD 1,920 million in the income statement separately from depreciation, depletion and amortization. Most of these expenses were related to the impairment of the infrastructure for the gathering, transportation and preparation of hydrocarbons.

It is natural that the costs of impairment, revaluation and write-off of assets and for companies from the United States, listing them in the structure of the profit and loss account separately, also reached their highest values precisely during crises, which then had a noticeable impact on the level of EBITDA. Then, when determining the value of the multiplier, it is advisable to use the adjusted EBITDA (*Table 7*), additionally cleared by the amount of the company's expenses for impairment, revaluation and write-off of assets, which are reported separately from depreciation, depletion and amortization expenses. This approach makes it possible to neutralize the influence of this factor on the value of the investigated multiplier (*Table 8*). But accounting for impairment, revaluation and write-down of assets in adjusted EBITDA alone is not enough to obtain a proper valuation through the appropriate multiplier. The EBITDA level can be significantly affected by other income and expenses that are not directly related to the operating activities of oil and gas corporations, which are usually one-off in nature, but are quite noticeable against the background of the total revenues or general expenses of the oil and gas company.

Thus, the rather high value of the EV / EBITDA multiplier of Anadarko Petroleum in 2011, when oil prices reached their highest values, deserves attention. This result was facilitated by the reporting of expenses in the amount of USD 3,930 million that Anadarko Petroleum incurred in accordance with an agreement with BP to repay part of the losses and related payments caused by the accident at the deepwater platform Deepwater Horizon. Adjusted for such costs, EBITDA is USD 5,154 million, and the EV to this value is 7.3 instead of 16.87. But the company reported USD 1,797 million in income in the income statement the following year as part of an agreement with Sonatrach to settle a dispute over compensation of Anadarko Petroleum for losses from payments of exclusive income tax on oil production for foreign companies in Algeria. An adjustment by this amount gives an EBITDA value of USD 6,847 million, which increases the multiplier from 5.55 to 7.01.

A similar factor for Occidental Petroleum in 2014 was the profit from the sale of assets, which reached USD 2,505 million. This component gives grounds to adjust EBITDA to USD 11,397 million and to raise the corresponding multiple from 4.69 to 5.72. In contrast, Marathon Oil's 2017 financial statements show a cumulative loss of USD 4,893 million from discontinued operations following the disposal of an oil sands business in Canada. Taking into account the indicated losses, the adjusted EBITDA already reaches USD 2,490 million, and the value of the multiplier calculated on its basis changes from -8.04 to 7.76.

The situation with the EV/DACF multiple for the leading publicly traded companies of the US oil and gas industry looked more stable and predictable, but there are some

nuances in this case. Thus, the multipliers of Anadarko Petroleum deserve quite close attention. This corporation stands out with a rather high multiplier value against the background of competitors in the US oil and gas sector in 2011, which is favorable for the entire industry. As mentioned earlier, Anadarko Petroleum repaid in the indicated period its component from losses and related payments that were caused by the accident on the deepwater platform Deepwater Horizon, which ultimately affected the DACF indicator of the corporation (*Table 9*). The adjusted DACF stands at USD 7,064 million on clean-up at these costs, and the multiplier is lowered from 16.14 to 7.16, which is in line with the performance of the rest of the leading US oil and gas companies at the time. The DACF adjustment for proceeds under the agreement with Sonatrach reduces this figure for 2012 to USD 7,051 million, and the corresponding multiplier increases from 5.42 to 6.81, which in itself is not so significant.

Of considerable interest is the fact that the value of this multiplier for Anadarko Petroleum in 2014–2015 was already in the negative range of values, which was facilitated by the corresponding DACF indicator. The reason for this in 2015 was the negative value of the net cash flow from the company's operating activities (*Table 10*). This very atypical multiplier value for the stock market segment of the global oil and gas industry was formed mainly as a result of the fact that Anadarko Petroleum reflected in the balance sheet unforeseen current obligations of USD 5,210 million related to Tronox following the results of the settlement agreement reached. As a result, this amount was reflected in the structure of net cash from operating activities of the company. Adjusting by such a value gives the DACF indicator of USD 3,913 million, and the corresponding multiplier acquires a quite acceptable value of 10.1.

But Anadarko Petroleum's net cash flow from operating activities had a positive value in 2014, and therefore the formation of a negative DACF value was due to other components of the indicator. Net cash flow from operating activities in the DACF is added to the interest expense, which is adjusted for the ratio of income tax expense to pre-tax income. And it is the ratio between the two final components that can cause the DACF value to be in the negative range with a positive net flow from operating activities.

The corporation's earnings before income tax (EBT) were only USD 54 million (*Table 11*), while income tax expenses reached USD 1,617 million (*Table 12*) according to the financial statements for the reporting period. The ratio of these indicators leads to the fact that the value of the correction factor reaches almost 30, which is a very high value and is far beyond the range from 0 to 1 typical for this indicator. And the indicated value is subtracted from 1 when adjusting the net profit from operating activities, and then the resulting number is multiplied by the interest expenses, which Anadarko Petroleum had in that year a very solid amount of USD 772 million (*Table 13*). This combination of interest expense and correction factor resulted in an impressive negative debt adjustment for Anadarko Petroleum.

It turns out that not only the structure of net cash flow from operating activities, but also the interest adjustment coefficient expressing the ratio of income tax expense to EBT deserves close attention when assessing the value using the EV/DACF multiple in the oil and gas industry. And such a need arises due to the fact that this amendment is designed for the situation when the company generates positive EBT, a certain part of which is directed to the payment of income tax. But the profitability of oil and gas companies depends on the price of raw materials, which are not constant. And therefore, the EBT indicator of some corporations during the crisis periods in the industry took on a negative value and was transformed into a loss before income tax, and income tax arose, which is especially typical for the US oil and gas sector. Consequently, the amendment can not only take on a value much higher than 1, but also change its sign.

But interest expense, cleared by capitalized amounts, is generally significantly less than net operating cash flow for publicly traded companies in the global oil and gas industry. Therefore, its impact on the DACF indicator when taking into account the correction factor is often quite insignificant. In non-trivial situations, as in the case of Anadarko Petroleum, it is advisable to abandon the correction factor and use interest expenses in its pure form, or even restrict ourselves to pure cash from operating activities alone, and then the ratio is converted into the previously mentioned EV/CF multiplier (*Table 14*). Such a replacement allows us to neutralize the possible effect of the correction factor when its value goes far beyond the characteristic range of values, which can distort the results of the value assessment.

The dynamics of changes in the indicators of the EV/EBITDA and EV/DACF multiples of the leading publicly traded oil and gas corporations in Canada is quite consistent with the previously identified patterns. But the data for 2016 require special attention. For example, Imperial Oil's EV/EBITDA was significantly influenced by the asset sale income of approximately USD 1,671 million, which was mainly due to the sale of the company's Esso-branded retail gas stations and the aviation business. Adjusting EBITDA by the indicated amount reduces the indicator to USD 1,415 million, which leads to an increase in the corresponding multiplier to 23.39. And the EV/DACF multiplier is remarkable in the case of Suncor Energy. The level of the multiplier lowered the correction factor significantly outside the range from 0 to 1, which is evident from the comparison with the indicator based on CF.

The situation with Husky Energy is also noteworthy, where the EV/EBITDA and EV/DACF multipliers began to significantly lag behind the corresponding indicators of their competitors in the oil and gas industry in Canada after the start of the protracted industry crisis. The reason for this is the fall in the market valuation of Husky Energy during the crisis periods for the oil and gas industry. Several factors had a negative impact on capitalization, among which it is necessary to highlight a serious decrease in profitability against the background of competitors at low oil prices. This result is associated with the structure of the business that the corporation possessed. Revenue in the upstream segment was primarily driven by the sale of heavy oil and bitumen derived

from oil sands. The Refining and Marketing segment included revenues from the sale of synthetic oil and road asphalt. But most of the revenue in this segment was generated by facilities located in the United States. And the sale of refined products from purchased raw materials is usually not as profitable as when developing from their own resources, therefore such activities do not contribute to a significant increase in market capitalization.

Husky Energy's already not very high provision of proved reserves of raw materials decreased (*Table 15*) amid prolonged persistence of low oil prices, which had a negative impact on the company's market valuation. And the corporation took a number of measures, including reducing the debt burden, abandoning new borrowings, cutting costs and developing the most profitable reserves. But the efforts made were not enough, and therefore Husky Energy sold in 2016 a number of assets worth approximately USD 1,217 million, mainly from the hydrocarbon transportation and storage segment. Then the EBITDA adjustment by this amount reduces the indicator to USD 1,512 million, and the corresponding multiplier increases to 10.39.

The indicators of EV/EBITDA and EV/DACF multipliers of the leading publicly traded oil and gas corporations in Europe are also correlated with the dynamics inherent for the entire stock market segment of the industry. But it is required to point out some of the peculiarities inherent in individual companies in this case as well. A good example is BP, for which the aforementioned multipliers had rather high values in 2010 in comparison with other European companies. This result is caused by the consequences of the accident on the deepwater platform Deepwater Horizon, already touched upon in the analysis of Anadarko Petroleum's data, where BP was the drilling operator with a 65% share. And the components of the corporations Anadarko Petroleum and Mitsui Oil Exploration in Deepwater Horizon accounted for 25 and 10%, respectively. In the income statement, BP recorded the consequences of the accident in the amount of USD 40,858 million, which is included in operating expenses. This circumstance makes it possible to additionally adjust the EBITDA indicator to the level of 49,349 million dollars. The ratio of EV to such EBITDA is 3.34, which is close enough to the multiples of other European companies.

But the DACF indicator is adjusted for several components at once. In this case, it is necessary to take into account in the net cash flow from operating activities not only production costs, which lead to its growth by an appropriate amount, but also the financial consequences of the accident on the balance sheet valuation of BP's assets and liabilities. These include a net provision for potential losses of USD 19,354 million and an increase in other current and long-term liabilities of USD 16,413 million caused by the accident, which lead to a decrease in the adjusted figure. The DACF value increases the decrease in all other non-reserves, current and non-current assets by USD 12,567 million, which was caused by that accident. The adjustment for all of the above components allows the adjusted DACF to be estimated at USD 31,757 million, and the corresponding multiplier increases to 5.19, which is quite consistent with the indicators of the main competitors in the European oil and gas sector.

Also noteworthy are the Equinor multiples, which have begun to lag significantly behind their European oil and gas rivals following the global financial turmoil during a favorable period for oil prices. The reasons for such a dynamics in the multiples are related to the market valuation of Equinor's equity capital, in which the drop in profitability and the growth of debt, although its effect was partially offset by the presence of net debt in the EV indicator structure, was not reflected in the best way. Equinor stands out for its very modest indicators of total proved reserves of liquid hydrocarbons and natural gas against the background of other companies from Europe, which also negatively affects the market capitalization of this oil and gas corporation.

The final group of companies under study is formed by the leading publicly traded oil and gas corporations from China, Brazil and Russia. And these companies are also quite typical of all the features in the dynamics of changes in the indicators of the EV/EBITDA and EV/DACF multipliers, which are inherent in the stock market segment of the global oil and gas industry. But oil and gas corporations from these countries also have certain points that need to be paid close attention to. Thus, Sinopec stands out against the background of the multipliers PetroChina and CNOOC with a very noticeable decline in indicators with the onset of a prolonged industry crisis. This result for the company was facilitated by a decrease in EV due to a significant decrease in the provision of total proved reserves of liquid hydrocarbons and natural gas.

Petrobras stood out for its fairly high EV / EBITDA multiples in 2014 and 2015. But such indicators were caused primarily not by the crisis in the industry, but by the grandiose corruption scandal that broke out at the same time in the company itself. This event caused a two-month delay in the publication of annual financial statements and a revaluation of the book value of Petrobras assets, which affected the corporation's EBITDA. And the company had a need to raise significant funds in connection with the commissioning of a large number of expensive construction in progress, which led to an increase in the debt component in the total capital structure. All of the above had an impact on capitalization, but the presence of net debt in the structure of the EV indicator partly compensated for the fall in the market valuation. However, the ratio of EV to adjusted for post-asset revaluation costs EBITDA is quite consistent with the multiples of competitors in the industry. But the ratio of EV to adjusted for asset revaluation costs EBITDA is quite consistent with the multiples of competitors in the industry.

The relatively low values of the EV/EBITDA and EV/DACF multipliers against the background of other studied leading publicly traded oil and gas corporations should be singled out as specific for oil and gas companies from Russia. This feature is clearly manifested in PJSC Gazprom and PJSC LUKOIL and is directly related to the market valuation of the share capital, which for large domestic oil and gas companies looks very insignificant, despite the relatively high profitability and good availability of proved reserves of raw materials. The key reason in this case is the country's factor, which is expressed in a very modest market assessment of the entire Russian economy. This attitude is facilitated by the fact that the balance of foreign trade in goods and the

replenishment of the country's budget are largely ensured by revenues from the sale of crude oil, natural gas and their processing products. The raw material model makes the entire Russian economy dependent on the situation on the world oil market and vulnerable to serious negative impacts from sectoral sanctions imposed on the country.

Conclusions

It was determined based on the results of the analysis that the EV/EBITDA and EV/DACF multiples are quite suitable for assessing the value of oil and gas companies within the framework of the comparative approach. These ratios are relevant for both independent companies and integrated corporations in the industry, but there are some nuances to be considered for their proper application. Thus, it was found that the ratio of equity and debt capital has a serious impact on the market valuation of oil and gas companies. This influence is smoothed out in the EV indicator, which also contains the company's net debt in addition to market capitalization. It was revealed that the EV indicator depends not only on the debt, but also on the profitability and availability of proved reserves and the country factor, which characterizes the market assessment of the entire economy of the country.

It is also important to pay attention to the formation of the EBITDA indicator. It was determined that EBITDA should be supplemented by the cost of impairment, revaluation and write-off of assets when the specified information is reflected in the structure of the income statement outside the cost of depreciation, depletion and amortization. It was established that it is required to adjust the EBITDA indicator for such income and expenses that are not related to the operating activities of oil and gas corporations, but can have a significant impact on the final financial result in the form of net income or loss. These are often the reported aggregate income or expenses that are generated by companies in the industry after the disposal of assets. They also include income or expenses based on the results of court decisions that have entered into force or amicable agreements concluded by corporations.

It was revealed that a thorough analysis is also necessary for those components that are included in the structure of the DACF indicator. It has been determined that it is advisable to adjust net cash from operating activities for significant income and expenses accounted for in their structure, as well as changes in assets and liabilities caused by extraordinary events for oil and gas companies. It has been found that an adjustment for interest payments that are usually insignificant for companies in the industry can come to the fore in the DACF when the adjustment factor, which expresses the ratio of income tax expense to EBT, goes far beyond the standard range of 0 to 1. In such cases, it is better to abandon the correction factor as such and use interest expenses in its pure form, or limit ourselves only to pure cash from operating activities, which leads to the transformation of the studied DACF-based multiplier into EV/CF.

Table 1**Enterprise value to EBITDA ratio of the twenty five leading publicly traded oil and gas corporations in 2008–2018**

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	3.89	6.80	5.46	4.55	4.13	6.10	5.97	8.90	13.46	10.05	6.41
Chevron	2.82	5.11	4.00	3.39	3.38	4.87	4.72	7.64	15.08	9.46	5.72
ConocoPhillips	16.73	5.10	3.74	3.49	3.77	4.33	5.28	29.18	18.16	14.95	4.83
Occidental Petroleum	3.60	8.93	8.06	5.60	5.52	5.28	9.99	–12.39	19.27	11.57	5.42
Devon Energy	40.09	–22.64	4.44	3.10	9.75	9.28	4.40	–1.35	–27.16	8.51	2.37
Anadarko Petroleum	2.81	9.34	7.60	41.32	5.81	7.44	9.26	–9.27	37.13	11.24	5.47
EOG Resources	3.55	10.58	11.16	6.66	8.20	6.93	5.91	–13.31	27.96	15.64	6.98
Apache	3.20	6.52	6.30	3.35	3.46	3.76	4.61	17.17	23.10	6.35	4.61
Marathon Oil	2.74	4.46	3.70	3.10	3.14	3.77	3.51	45.28	12.75	–7.34	3.86
Imperial Oil	5.56	11.44	9.43	7.44	6.50	9.47	8.03	13.66	10.72	12.99	6.60
Suncor Energy	7.08	17.74	8.45	4.81	4.92	5.34	5.58	10.78	13.40	7.66	6.61
Husky Energy	3.82	7.21	7.20	4.46	5.71	6.53	5.45	6.26	5.76	6.03	3.44
Canadian Natural Resources	3.90	9.77	7.72	6.38	5.47	5.97	5.13	9.70	15.40	8.89	6.38
Royal Dutch Shell	2.54	5.85	4.53	3.66	3.58	4.68	4.38	5.72	9.07	7.20	4.81
BP	3.66	5.54	24.23	3.28	5.08	4.01	6.87	19.94	12.98	7.93	5.40
TOTAL	3.25	4.88	3.91	3.29	3.27	4.29	4.47	5.50	7.18	5.50	4.81
Eni	2.69	3.93	3.21	3.03	2.69	3.20	3.86	6.54	8.68	4.51	3.67
Equinor (Statoil)	1.93	3.20	2.82	2.20	1.86	2.69	2.68	4.35	7.22	4.23	3.08
PetroChina	7.26	10.84	7.13	6.05	6.13	5.06	6.63	6.75	6.39	5.64	4.32
Sinopec	9.61	9.39	5.07	4.68	5.10	4.47	6.35	4.82	3.59	3.80	3.12
CNOOC	4.17	8.47	6.93	4.14	4.94	4.50	3.48	4.86	7.90	5.40	4.70
Petrobras	3.31	8.23	8.11	5.86	7.97	6.72	22.17	18.41	9.87	7.34	5.36
PJSC Gazprom	2.89	4.49	3.46	2.53	2.36	2.24	6.13	3.73	2.92	3.30	2.59
PJSC NK Rosneft	3.31	7.83	4.66	3.83	4.82	4.52	5.11	5.39	7.87	6.23	5.11
PJSC LUKOIL	2.26	4.18	3.29	2.62	2.85	3.41	2.53	2.96	4.74	3.08	3.12
Average value	5.87	6.29	6.58	5.71	4.82	5.15	6.10	8.05	10.94	7.21	4.75

Source: Authoring, based on [19, 20]**Table 2****Enterprise value to DCF ratio of the twenty five leading publicly traded oil and gas corporations in 2008–2018**

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	6.24	11.17	7.64	7.31	6.95	10.17	9.11	11.74	18.33	12.82	8.86
Chevron	4.97	8.05	5.74	4.99	5.20	6.95	7.17	10.12	20.31	13.08	7.45
ConocoPhillips	3.81	7.93	6.29	5.48	6.23	6.21	5.98	9.87	16.47	10.52	5.97
Occidental Petroleum	4.58	11.24	8.65	6.15	5.95	6.10	5.88	16.34	17.63	12.09	6.70
Devon Energy	3.58	8.04	6.35	4.45	5.33	5.77	5.60	4.13	12.29	8.42	5.49
Anadarko Petroleum	3.77	8.35	8.30	16.14	5.42	5.42	–3.57	–30.46	13.85	9.60	5.71
EOG Resources	3.90	8.92	10.02	6.58	7.17	6.74	6.19	11.96	24.90	12.74	6.94
Apache	3.98	9.42	7.82	4.15	5.01	4.21	3.93	7.55	11.41	7.40	4.45
Marathon Oil	3.69	5.40	5.10	3.78	6.79	5.74	4.03	8.04	11.24	7.63	4.61
Imperial Oil	7.83	21.43	10.88	8.57	7.99	13.94	11.15	21.27	21.38	13.00	7.81
Suncor Energy	6.59	24.10	12.39	5.25	6.36	5.96	6.70	8.62	11.20	9.71	6.82
Husky Energy	3.94	13.88	9.66	4.99	5.94	7.88	5.65	5.54	9.52	5.12	3.79
Canadian Natural Resources	5.74	8.28	8.68	7.74	6.17	6.56	6.10	8.32	18.20	9.82	5.61
Royal Dutch Shell	3.69	9.55	8.39	6.83	5.05	6.42	5.18	5.44	12.95	8.89	5.26
BP	4.34	7.42	11.69	7.33	7.75	8.15	4.25	6.38	15.90	9.66	7.58
TOTAL	5.41	9.11	6.24	5.77	4.90	5.82	5.75	6.69	8.96	6.79	6.30
Eni	3.59	7.71	5.71	5.85	6.59	7.47	4.94	5.51	11.18	6.41	4.64

Equinor (Statoil)	4.11	7.37	6.50	5.19	3.87	5.57	2.71	4.59	3.32	6.48	4.43
PetroChina	10.80	9.62	6.93	6.69	8.10	5.97	6.30	6.84	6.47	4.58	4.32
Sinopec	9.75	8.21	4.89	5.23	5.79	5.19	6.69	4.42	3.19	3.94	3.58
CNOOC	5.00	8.99	8.27	4.34	6.52	5.54	4.41	5.37	7.24	5.57	4.77
Petrobras	3.89	9.72	10.07	6.57	7.70	7.60	6.82	5.93	8.50	5.70	6.39
PJSC Gazprom	3.37	5.81	3.57	2.99	2.97	2.41	2.39	2.49	3.29	4.30	3.86
PJSC NK Rosneft	3.85	9.41	5.65	5.12	6.05	3.80	3.02	2.36	9.29	13.90	4.83
PJSC LUKOIL	2.42	6.01	3.77	2.95	2.76	3.34	2.52	2.58	3.70	3.41	3.41
Average value	4.91	9.81	7.57	6.02	5.94	6.36	5.16	6.07	12.03	8.46	5.58

Source: Authoring, based on [19, 20]

Table 3

Return on assets of the twenty five leading publicly traded oil and gas corporations in 2008–2018, percent

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	19.24	8.36	11.37	12.96	13.5	9.57	9.34	4.71	2.35	5.81	6
Chevron	15.44	6.44	10.89	13.64	11.83	8.8	7.4	1.72	-0.19	3.58	5.84
ConocoPhillips	-10.6	3.29	7.35	8.04	6.23	7.79	5.86	-4.14	-3.86	-0.97	8.73
Occidental Petroleum	17.57	6.8	9.37	12.04	7.4	8.83	0.98	-15.71	-1.33	3.08	9.62
Devon Energy	-5.86	-8.05	14.53	12.71	-0.49	-0.05	3.44	-36.06	-11.91	3.2	12.3
Anadarko Petroleum	6.7	-0.27	1.5	-5.13	4.58	1.48	-2.98	-12.38	-6.68	-1.04	1.49
EOG Resources	17.38	3.21	0.81	4.7	2.19	7.59	8.92	-14.66	-3.89	8.71	10.72
Apache	2.46	-0.99	8.47	9.6	3.55	3.65	-9.19	-61.82	-6.79	5.87	0.18
Marathon Oil	8.26	3.26	5.29	7.24	4.75	4.94	8.5	-6.45	-6.75	-21.55	5.06
Imperial Oil	23.28	9.15	11.62	14.65	13.75	8.49	9.7	2.67	5.1	1.18	5.57
Suncor Energy	7.54	2.24	5.1	5.94	3.68	5.05	3.42	-2.54	0.52	5	3.68
Husky Energy	15.57	5.36	4.23	7.23	5.99	5.08	3.32	-10.71	2.82	2.41	4.28
Canadian Natural Resources	12.66	3.78	4.06	5.88	3.93	4.51	7.02	-1.07	-0.35	3.62	3.56
Royal Dutch Shell	9.52	4.36	6.55	9.26	7.54	4.56	4.19	0.56	1.22	3.17	5.79
BP	9.11	7.14	-1.46	9.09	3.9	7.74	1.28	-2.37	0.04	1.26	3.36
TOTAL	9.14	6.87	7.79	7.98	6.37	4.89	1.85	2.24	2.72	3.64	4.58
Eni	8.09	3.73	5.07	4.99	5.51	3.72	0.91	-6.25	-1.13	2.82	3.54
Equinor (Statoil)	8.15	3.21	6.32	11.16	8.87	4.78	2.34	-3.84	-2.73	4.26	6.74
PetroChina	10.15	7.82	9.01	7.44	5.64	5.75	4.51	1.48	0.33	0.95	2.17
Sinopec	3.97	7.51	7.67	6.84	5.3	4.99	3.28	2.24	3.17	3.31	3.87
CNOOC	23.68	13.13	19.36	20.16	15.23	10.61	9.26	2.98	0.09	4.06	7.92
Petrobras	13.89	10.32	7.65	6.41	3.39	3.4	-2.38	-3.19	-2.03	-0.04	3.03
PJSC Gazprom	10.64	10.04	11.01	12.98	10.3	8.93	1.11	4.88	5.6	4.06	7.46
PJSC NK Rosneft	14.6	8.1	11.75	12.46	9.38	9.56	4.28	3.86	1.75	1.91	4.32
PJSC LUKOIL	13.95	9.32	11.05	11.82	11.57	7.52	4.29	5.15	4.12	8.18	11.3
Average value	10.58	5.36	7.85	9.2	6.96	6.09	3.63	-5.95	-0.71	2.26	5.64

Source: Authoring, based on [19, 20]

Table 4**Enterprise value indicator of the twenty five leading publicly traded oil and gas corporations in 2008–2018, million USD**

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	375 222	321 246	371 253	405 623	391 647	456 757	412 887	358 942	413 503	393 709	323 675
Chevron	147 386	156 072	180 313	204 956	201 670	243 117	225 824	196 868	261 675	272 306	232 127
ConocoPhillips	103 373	104 014	111 573	110 530	88 856	102 029	102 540	80 221	85 702	77 989	80 029
Occidental Petroleum	49 577	67 616	82 268	78 082	67 741	79 245	65 168	56 825	62 023	64 514	53 282
Devon Energy	34 520	39 725	36 539	29 279	27 774	31 047	34 756	23 761	32 080	29 468	13 618
Anadarko Petroleum	25 968	38 364	47 128	50 578	47 995	49 826	49 522	39 505	50 574	39 608	36 577
EOG Resources	18 186	26 680	27 660	30 895	38 246	50 430	54 304	44 866	63 691	67 976	55 291
Apache	28 686	37 730	53 600	41 714	42 929	41 836	34 072	24 121	31 235	22 900	17 326
Marathon Oil	25 216	28 579	30 236	24 928	27 689	30 802	23 089	14 579	19 447	19 322	15 781
Imperial Oil	27 284	32 587	34 853	37 843	37 540	43 137	42 323	33 617	33 095	29 191	22 914
Suncor Energy	24 033	68 267	70 975	51 898	56 688	57 636	52 687	45 456	65 271	70 654	55 375
Husky Energy	22 274	27 148	27 558	25 461	31 214	34 254	27 231	15 459	15 714	17 194	11 933
Canadian Natural Resources	32 159	48 619	56 805	49 536	40 144	45 805	45 855	35 990	47 910	61 574	44 062
Royal Dutch Shell	164 408	208 376	234 422	256 444	237 664	264 607	238 417	173 331	302 350	343 634	292 258
BP	168 668	209 092	164 846	166 158	162 112	177 436	142 105	125 809	168 850	189 461	181 005
TOTAL	137 642	156 546	148 996	141 408	139 708	164 875	148 732	138 183	156 660	158 459	163 436
Eni	110 692	126 299	114 146	111 400	109 695	115 781	91 216	78 682	81 455	80 401	73 904
Equinor (Statoil)	60 508	93 831	90 250	97 653	89 558	93 183	76 464	68 836	86 544	95 040	89 061
PetroChina	272 982	374 665	330 271	317 394	326 669	300 936	385 552	294 102	261 601	267 608	230 100
Sinopec	113 969	189 934	130 282	130 690	138 700	136 099	171 203	117 250	102 393	118 541	94 744
CNOOC	40 865	69 693	105 006	80 373	97 120	102 448	79 708	70 073	75 548	82 504	87 153
Petrobras	109 340	239 961	280 120	219 221	207 193	190 037	163 445	127 057	161 177	151 849	151 865
PJSC Gazprom	121 842	183 977	174 500	154 411	144 470	131 295	82 500	71 437	88 178	91 696	92 225
PJSC NK Rosneft	59 021	101 473	88 302	81 895	103 954	145 125	90 815	74 722	116 423	117 470	117 037
PJSC LUKOIL	35 280	56 511	53 231	47 311	53 640	56 160	40 380	31 213	47 746	46 046	50 738
Average value	92 364	120 280	121 805	117 827	116 425	125 756	115 232	93 636	113 234	116 364	103 421

Source: Authoring, based on [19, 20]

Table 5**EBITDA of the twenty five leading publicly traded oil and gas corporations in 2008–2018, million USD**

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	96 449	47 242	67 978	89 087	94 941	74 902	69 213	40 325	30 730	39 168	50 464
Chevron	52 245	30 571	45 048	60 400	59 579	49 955	47 850	25 760	17 353	28 770	40 550
ConocoPhillips	6 179	20 389	29 810	31 691	23 566	23 557	19 415	2 749	4 720	5 216	16 567
Occidental Petroleum	13 779	7 569	10 201	13 932	12 276	15 017	6 523	-4 586	3 218	5 576	9 838
Devon Energy	861	-1 755	8 233	9 459	2 848	3 346	7 904	-17 622	-1 181	3 461	5 739
Anadarko Petroleum	9 238	4 107	6 197	1 224	8 255	6 700	5 350	-4 261	1 362	3 523	6 686
EOG	5 125	2 522	2 479	4 637	4 664	7 273	9 194	-3 371	2 278	4 345	7 921

Resources											
Apache	8 969	5 789	8 514	12 467	12 393	11 113	7 388	1 405	1 352	3 604	3 760
Marathon Oil	9 205	6 401	8 176	8 050	8 810	8 160	6 569	322	1 525	-2 632	4 084
Imperial Oil	4 905	2 850	3 698	5 085	5 778	4 557	5 273	2 462	3 086	2 247	3 469
Suncor Energy	3 393	3 848	8 398	10 801	11 515	10 801	9 437	4 216	4 872	9 223	8 377
Husky Energy	5 834	3 765	3 830	5 703	5 464	5 247	4 996	2 468	2 729	2 854	3 468
Canadian	8 237	4 975	7 361	7 761	7 333	7 672	8 942	3 712	3 112	6 927	6 906
Natural Resources											
Royal Dutch Shell	64 645	35 636	51 782	70 052	66 447	56 549	54 411	30 290	33 351	47 718	60 729
BP	46 056	37 723	6 802	50 590	31 889	44 293	20 695	6 308	13 004	23 897	33 499
TOTAL	44 331	33 987	39 980	45 122	44 995	40 645	33 268	25 135	21 807	28 827	33 991
Eni	41 130	32 115	35 522	36 811	40 731	36 230	23 641	12 029	9 389	17 808	20 120
Equinor (Statoil)	31 284	29 360	32 005	44 466	48 254	34 617	28 526	15 836	11 979	22 480	28 880
PetroChina	37 620	34 578	46 333	52 453	53 279	59 461	58 170	43 581	40 961	47 438	53 287
Sinopec	11 855	20 234	25 704	27 939	27 215	30 421	26 972	24 301	28 539	31 205	30 404
CNOOC	9 803	8 232	15 153	19 437	19 640	22 758	22 905	14 415	9 559	15 274	18 543
Petrobras	33 026	29 153	34 526	37 436	26 011	28 263	7 372	6 903	16 330	20 692	28 332
PJSC Gazprom	42 196	40 935	50 377	61 139	61 128	58 494	13 451	19 142	30 248	27 791	35 674
PJSC NK Rosneft	17 839	12 958	18 946	21 364	21 565	32 081	17 775	13 872	14 788	18 854	22 902
PJSC LUKOIL	15 635	13 533	16 162	18 075	18 836	16 463	15 950	10 534	10 076	14 938	16 283
Average value	24 794	18 669	23 329	29 807	28 697	27 543	21 248	11 037	12 607	17 168	22 019

Source: Authoring, based on [19, 20]

Table 6

Impairment, revaluation and write-off of assets of the twenty five leading publicly traded oil and gas corporations in 2008–2018, million USD

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	0	0	0	0	0	0	0	0	0	0	0
Chevron	0	0	0	0	0	0	0	0	0	0	0
ConocoPhillips	32 853	0	0	792	680	529	856	2 245	139	6 601	27
Occidental Petroleum	647	170	275	0	1 751	621	7 379	10 239	825	545	561
Devon Energy	10 379	6 408	0	0	2 024	1 976	1 953	20 820	4 975	17	156
Anadarko Petroleum	223	115	216	1 774	389	794	836	5 075	227	408	800
EOG	193	306	743	1 031	1 271	287	744	6 614	620	479	347
Resources											
Apache	0	0	0	0	0	0	2 357	1 920	1 103	8	511
Marathon Oil	0	0	479	310	371	96	132	752	67	229	75
Imperial Oil	0	0	0	0	0	0	0	0	0	0	0
Suncor Energy	0	0	0	0	0	0	0	0	0	0	0
Husky Energy	0	0	0	0	0	0	0	0	0	0	0
Canadian	0	0	0	389	0	0	0	0	0	0	0
Natural Resources											
Royal Dutch Shell	0	0	0	0	0	0	0	0	0	0	0
BP	1 733	2 333	1 689	2 058	6 275	1 961	8 965	1 909	-1 664	1 216	860
TOTAL	0	0	0	0	0	0	0	0	0	0	0
Eni	0	0	0	0	0	0	0	0	369	315	1 106
Equinor (Statoil)	0	0	0	0	0	0	0	0	0	0	0
PetroChina	0	0	0	0	0	0	0	0	0	0	0
Sinopec	0	0	0	0	0	0	0	0	0	0	0
CNOOC	226	1	4	3	5	-7	664	424	1 753	1 403	82
Petrobras	519	319	402	0	0	0	16 823	12 299	6 193	1 191	2 005
PJSC Gazprom	0	0	0	0	0	0	0	0	0	0	0
PJSC NK Rosneft	0	0	0	0	0	0	0	0	0	0	0

PJSC LUKOIL	425	381	363	1 663	–30	2 561	1 753	0	0	0	0
Average value	1 888	401	167	321	509	353	1 698	2 492	584	497	261

Source: Authoring, based on [19, 20]

Table 7

Adjusted EBITDA of the twenty five leading publicly traded oil and gas corporations in 2008–2018, million USD

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	96 449	47 242	67 978	89 087	94 941	74 902	69 213	40 325	30 730	39 168	50 464
Chevron	52 245	30 571	45 048	60 400	59 579	49 955	47 850	25 760	17 353	28 770	40 550
ConocoPhillips	39 032	20 389	29 810	32 483	24 246	24 086	20 271	4 994	4 859	11 817	16 594
Occidental Petroleum	14 426	7 739	10 476	13 932	14 027	15 638	13 902	5 653	4 043	6 121	10 399
Devon Energy	11 240	4 653	8 233	9 459	4 872	5 322	9 857	3 198	3 794	3 478	5 895
Anadarko Petroleum	9 461	4 222	6 413	2 998	8 644	7 494	6 186	814	1 589	3 931	7 486
EOG Resources	5 318	2 828	3 222	5 668	5 935	7 560	9 937	3 243	2 898	4 824	8 268
Apache	8 969	5 789	8 514	12 467	12 393	11 113	9 745	3 325	2 455	3 612	4 271
Marathon Oil	9 205	6 401	8 655	8 360	9 181	8 256	6 701	1 074	1 592	–2 403	4 159
Imperial Oil	4 905	2 850	3 698	5 085	5 778	4 557	5 273	2 462	3 086	2 247	3 469
Suncor Energy	3 393	3 848	8 398	10 801	11 515	10 801	9 437	4 216	4 872	9 223	8 377
Husky Energy	5 834	3 765	3 830	5 703	5 464	5 247	4 996	2 468	2 729	2 854	3 468
Canadian Natural Resources	8 237	4 975	7 361	8 150	7 333	7 672	8 942	3 712	3 112	6 927	6 906
Royal Dutch Shell	64 645	35 636	51 782	70 052	66 447	56 549	54 411	30 290	33 351	47 718	60 729
BP	47 789	40 056	8 491	52 648	38 164	46 254	29 660	8 217	11 340	25 113	34 359
TOTAL	44 331	33 987	39 980	45 122	44 995	40 645	33 268	25 135	21 807	28 827	33 991
Eni	41 130	32 115	35 522	36 811	40 731	36 230	23 641	12 029	9 758	18 124	21 226
Equinor (Statoil)	31 284	29 360	32 005	44 466	48 254	34 617	28 526	15 836	11 979	22 480	28 880
PetroChina	37 620	34 578	46 333	52 453	53 279	59 461	58 170	43 581	40 961	47 438	53 287
Sinopec	11 855	20 234	25 704	27 939	27 215	30 421	26 972	24 301	28 539	31 205	30 404
CNOOC	10 029	8 233	15 157	19 440	19 645	22 751	23 569	14 839	11 312	16 677	18 625
Petrobras	33 545	29 472	34 928	37 436	26 011	28 263	24 195	19 202	22 523	21 883	30 337
PJSC Gazprom	42 196	40 935	50 377	61 139	61 128	58 494	13 451	19 142	30 248	27 791	35 674
PJSC NK Rosneft	17 839	12 958	18 946	21 364	21 565	32 081	17 775	13 872	14 788	18 854	22 902
PJSC LUKOIL	16 060	13 914	16 525	19 738	18 806	19 024	17 703	10 534	10 076	14 938	16 283
Average value	26 681	19 070	23 495	30 128	29 206	27 896	22 946	13 529	13 192	17 665	22 280

Source: Authoring, based on [19, 20]

Table 8

Enterprise value to adjusted EBITDA ratio of the twenty five leading publicly traded oil and gas corporations in 2008–2018

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	3.89	6.80	5.46	4.55	4.13	6.10	5.97	8.90	13.46	10.05	6.41
Chevron	2.82	5.11	4.00	3.39	3.38	4.87	4.72	7.64	15.08	9.46	5.72
ConocoPhillips	2.65	5.10	3.74	3.40	3.66	4.24	5.06	16.06	17.64	6.60	4.82
Occidental Petroleum	3.44	8.74	7.85	5.60	4.83	5.07	4.69	10.05	15.34	10.54	5.12
Devon Energy	3.07	8.54	4.44	3.10	5.70	5.83	3.53	7.43	8.46	8.47	2.31
Anadarko Petroleum	2.74	9.09	7.35	16.87	5.55	6.65	8.01	48.53	31.83	10.08	4.89
EOG Resources	3.42	9.43	8.58	5.45	6.44	6.67	5.46	13.83	21.98	14.09	6.69
Apache	3.20	6.52	6.30	3.35	3.46	3.76	3.50	7.25	12.72	6.34	4.06
Marathon Oil	2.74	4.46	3.49	2.98	3.02	3.73	3.45	13.57	12.22	–8.04	3.79
Imperial Oil	5.56	11.44	9.43	7.44	6.50	9.47	8.03	13.66	10.72	12.99	6.60

Suncor Energy	7.08	17.74	8.45	4.81	4.92	5.34	5.58	10.78	13.40	7.66	6.61
Husky Energy	3.82	7.21	7.20	4.46	5.71	6.53	5.45	6.26	5.76	6.03	3.44
Canadian Natural Resources	3.90	9.77	7.72	6.08	5.47	5.97	5.13	9.70	15.40	8.89	6.38
Royal Dutch Shell	2.54	5.85	4.53	3.66	3.58	4.68	4.38	5.72	9.07	7.20	4.81
BP	3.53	5.22	19.41	3.16	4.25	3.84	4.79	15.31	14.89	7.54	5.27
TOTAL	3.10	4.61	3.73	3.13	3.10	4.06	4.47	5.50	7.18	5.50	4.81
Eni	2.69	3.93	3.21	3.03	2.69	3.20	3.86	6.54	8.35	4.44	3.48
Equinor (Statoil)	1.93	3.20	2.82	2.20	1.86	2.69	2.68	4.35	7.22	4.23	3.08
PetroChina	7.26	10.84	7.13	6.05	6.13	5.06	6.63	6.75	6.39	5.64	4.32
Sinopec	9.61	9.39	5.07	4.68	5.10	4.47	6.35	4.82	3.59	3.80	3.12
CNOOC	4.07	8.46	6.93	4.13	4.94	4.50	3.38	4.72	6.68	4.95	4.68
Petrobras	3.26	8.14	8.02	5.86	7.97	6.72	6.76	6.62	7.16	6.94	5.01
PJSC Gazprom	2.89	4.49	3.46	2.53	2.36	2.24	6.13	3.73	2.92	3.30	2.59
PJSC NK Rosneft	3.31	7.83	4.66	3.83	4.82	4.52	5.11	5.39	7.87	6.23	5.11
PJSC LUKOIL	2.20	4.06	3.22	2.40	2.85	2.95	2.28	2.96	4.74	3.08	3.12
Average value	3.79	7.44	6.25	4.65	4.50	4.93	5.02	9.84	11.20	6.64	4.65

Source: Authoring, based on [19, 20]

Table 9

DACF of the twenty five leading publicly traded oil and gas corporations in 2008–2018, million USD

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	60 103	28 748	48 567	55 487	56 368	44 919	45 302	30 578	22 558	30 705	36 544
Chevron	29 632	19 389	31 389	41 098	38 812	35 002	31 475	19 456	12 886	20 824	31 158
ConocoPhillips	27 151	13 113	17 731	20 174	14 266	16 427	17 136	8 128	5 204	7 410	13 599
Occidental Petroleum	10 834	6 014	9 514	12 702	11 389	12 999	11 089	3 477	3 519	5 337	7 956
Devon Energy	9 652	4 943	5 755	6 582	5 207	5 377	6 204	5 757	2 610	3 500	2 482
Anadarko Petroleum	6 886	4 596	5 675	3 134	8 848	9 195	-13 879	-1 297	3 653	4 126	6 409
EOG Resources	4 667	2 990	2 760	4 699	5 332	7 480	8 767	3 750	2 557	5 337	7 966
Apache	7 208	4 007	6 857	10 049	8 576	9 942	8 674	3 193	2 737	3 093	3 896
Marathon Oil	6 840	5 295	5 924	6 592	4 077	5 368	5 732	1 812	1 730	2 533	3 424
Imperial Oil	3 483	1 521	3 204	4 415	4 700	3 095	3 797	1 580	1 548	2 246	2 933
Suncor Energy	3 645	2 833	5 728	9 884	8 914	9 671	7 859	5 275	5 830	7 277	8 114
Husky Energy	5 652	1 956	2 853	5 106	5 253	4 345	4 820	2 791	1 650	3 357	3 148
Canadian Natural Resources	5 600	5 869	6 548	6 400	6 502	6 984	7 513	4 328	2 633	6 273	7 849
Royal Dutch Shell	44 533	21 816	27 927	37 540	47 078	41 248	45 983	31 839	23 344	38 645	55 598
BP	38 826	28 195	14 099	22 684	20 926	21 764	33 433	19 725	10 618	19 617	23 892
TOTAL	26 589	18 208	25 030	25 713	30 038	30 018	25 855	20 665	17 479	23 342	25 939
Eni	30 864	16 379	19 979	19 031	16 648	15 497	18 452	14 283	7 285	12 535	15 922
Equinor (Statoil)	14 739	12 729	13 887	18 829	23 146	16 716	28 193	14 981	26 038	14 672	20 109
PetroChina	25 287	38 954	47 673	47 419	40 333	50 382	61 151	42 969	40 417	58 490	53 272
Sinopec	11 693	23 137	26 625	25 005	23 967	26 216	25 585	26 507	32 127	30 109	26 474
CNOOC	8 174	7 751	12 694	18 509	14 890	18 497	18 092	13 037	10 431	14 813	18 271
Petrobras	28 099	24 694	27 825	33 352	26 894	25 021	23 967	21 421	18 953	26 654	23 775
PJSC Gazprom	36 124	31 651	48 904	51 653	48 571	54 429	34 461	28 664	26 820	21 305	23 880
PJSC NK Rosneft	15 344	10 782	15 637	16 005	17 195	38 234	30 035	31 720	12 533	8 448	24 248
PJSC LUKOIL	497	311	463	498	640	513	285	12 104	12 908	13 490	14 863
Average value	18 485	13 435	17 330	20 102	19 543	20 374	19 599	14 670	12 323	15 366	18 461

Source: Authoring, based on [19, 20]

Table 10**Net cash from operating activities of the twenty five leading publicly traded oil and gas corporations in 2008–2018, million USD**

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	59 725	28 438	48 413	55 345	56 170	44 914	45 116	30 344	22 082	30 066	36 014
Chevron	29 632	19 373	31 359	41 098	38 812	35 002	31 475	19 456	12 846	20 515	30 618
ConocoPhillips	22 658	12 479	17 045	19 646	13 922	16 087	16 735	7 572	4 403	7 077	12 934
Occidental Petroleum	10 652	5 813	9 349	12 281	11 312	12 927	11 068	3 351	3 383	4 996	7 669
Devon Energy	9 408	4 737	5 478	6 224	4 956	5 436	5 981	5 383	1 746	2 909	2 228
Anadarko Petroleum	6 442	3 926	5 247	2 505	8 339	8 888	8 466	-1 877	3 000	4 009	5 929
EOG Resources	4 633	2 922	2 709	4 578	5 237	7 329	8 649	3 595	2 359	4 265	7 769
Apache	7 065	4 224	6 726	9 953	8 504	9 835	8 461	2 984	2 430	2 428	3 777
Marathon Oil	6 782	5 268	5 873	6 524	4 017	5 270	5 487	1 565	1 073	2 129	3 234
Imperial Oil	3 483	1 521	3 204	4 415	4 700	3 095	3 797	1 566	1 501	2 202	2 875
Suncor Energy	3 645	2 461	5 481	9 823	8 883	9 495	7 703	4 974	4 230	7 147	7 755
Husky Energy	5 557	1 833	2 701	5 008	5 211	4 367	4 814	2 717	1 468	2 952	3 030
Canadian Natural Resources	5 529	5 556	6 278	6 140	6 235	6 786	7 292	4 070	2 571	5 789	7 419
Royal Dutch Shell	43 918	21 488	27 350	36 771	46 140	40 440	45 044	29 810	20 615	35 650	53 085
BP	38 095	27 716	13 616	22 154	20 397	21 100	32 754	19 133	10 691	18 931	22 873
TOTAL	25 982	17 806	24 710	25 278	29 636	29 613	25 608	19 946	16 521	22 319	24 703
Eni	30 340	16 043	19 634	18 609	16 322	15 127	18 345	12 959	8 088	12 133	15 626
Equinor (Statoil)	14 650	12 637	13 799	18 600	22 995	16 651	28 090	18 822	9 034	14 363	19 694
PetroChina	24 947	38 366	46 912	46 050	38 070	47 355	58 257	40 241	38 227	56 113	51 225
Sinopec	9 907	22 272	25 720	23 905	22 652	24 930	24 244	25 536	30 927	29 221	25 625
CNOOC	8 170	7 744	12 651	18 456	14 858	18 318	17 811	12 365	10 494	14 561	18 018
Petrobras	28 220	24 920	28 495	33 698	27 888	26 289	26 632	25 913	26 114	27 112	26 353
PJSC Gazprom	34 600	29 664	47 909	50 859	47 596	53 404	34 053	27 866	25 905	20 608	23 282
PJSC NK Rosneft	14 393	10 319	15 172	15 749	16 989	37 062	28 902	30 117	10 683	5 851	21 621
PJSC LUKOIL	14 312	8 883	13 541	15 514	18 997	16 449	15 568	11 648	12 402	13 168	14 490
Average value	18 510	13 456	17 575	20 367	19 954	20 647	20 814	14 402	11 312	14 661	17 914

Source: Authoring, based on [19, 20]

Table 11**Earnings before income tax (EBT) of the twenty five leading publicly traded oil and gas corporations for 2008–2018, million USD**

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	83 397	34 777	52 959	73 257	78 726	57 711	51 630	21 966	7 969	18 674	30 953
Chevron	43 057	18 528	32 055	47 634	46 332	35 905	31 202	4 842	-2 160	9 221	20 575
ConocoPhillips	-3 523	10 032	19 750	23 001	16 440	15 624	10 521	-7 239	-5 530	-2 615	9 973
Occidental Petroleum	11 176	4 430	7 043	10 208	7 716	9 658	2 315	-9 159	-1 236	1 328	5 608
Devon Energy	-2 902	-4 204	5 953	6 880	-333	149	4 059	-21 268	-3 877	896	3 783
Anadarko Petroleum	5 346	-108	1 641	-3 424	3 565	2 106	54	-9 689	-3 829	-1 688	1 485
EOG Resources	3 747	972	408	1 910	1 281	3 437	4 995	-6 922	-1 558	661	4 241
Apache	932	326	5 206	8 093	4 877	4 216	-2 906	-28 226	-1 682	918	958
Marathon Oil	6 973	3 720	5 122	5 666	6 113	5 090	3 438	-2 958	-1 235	-5 347	1 427
Imperial Oil	4 310	2 103	2 951	4 333	5 014	3 513	4 328	1 390	1 820	464	2 253
Suncor Energy	2 559	1 232	4 243	6 952	5 062	5 994	3 957	-1 465	64	4 716	3 653
Husky Energy	4 208	1 871	1 557	3 088	2 848	2 471	1 538	-3 881	708	338	1 413
Canadian Natural Resources	5 940	1 888	2 875	3 845	2 620	2 854	4 451	-482	-792	2 290	2 582
Royal Dutch Shell	50 820	21 020	35 344	55 660	50 289	33 592	28 314	2 047	5 606	18 130	35 621
BP	34 283	25 124	-4 825	38 834	18 809	30 221	4 950	-9 571	-2 295	7 180	16 723
TOTAL	34 930	23 597	28 107	34 488	31 543	27 266	12 864	6 439	7 176	11 328	18 066
Eni	26 790	17 392	22 101	23 907	21 902	19 280	8 914	-4 333	940	8 208	11 573

Equinor (Statoil)	25 785	19 889	23 362	35 684	37 134	22 749	14 722	488	-178	13 420	18 874
PetroChina	23 678	20 508	28 584	29 236	26 539	29 225	25 618	8 903	6 507	8 125	16 786
Sinopec	3 558	11 799	15 657	16 595	14 421	15 600	10 705	8 667	11 554	13 268	14 441
CNOOC	8 484	5 980	11 008	14 708	14 475	13 356	13 299	2 644	-760	5 588	10 934
Petrobras	26 992	22 061	25 831	26 724	14 493	13 410	-8 824	-9 748	-3 665	1 997	12 098
PJSC Gazprom	35 113	32 384	41 792	52 178	49 780	45 405	5 454	12 695	21 187	17 674	26 667
PJSC NK Rosneft	13 119	8 519	13 316	15 706	14 388	19 310	8 497	6 312	5 226	6 858	11 976
PJSC LUKOIL	12 449	9 063	11 470	13 119	13 723	10 458	6 772	5 339	4 493	9 100	11 127
Average value	18 449	11 716	15 740	21 931	19 510	17 144	10 035	-1 328	1 778	6 029	11 752

Source: Authoring, based on [19, 20]

Table 12

Income taxes of the twenty five leading publicly traded oil and gas corporations for 2008–2018, million USD

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	36 530	15 119	21 561	31 051	31 045	24 263	18 015	5 415	-406	-1 174	9 532
Chevron	19 026	7 965	12 919	20 626	19 996	14 308	11 892	132	-1 729	-48	5 715
ConocoPhillips	13 405	5 096	8 333	10 499	7 942	6 409	3 583	-2 868	-1 971	-1 822	3 668
Occidental Petroleum	4 629	1 918	2 995	4 201	-3 118	-3 755	-1 685	1 330	662	-17	-1 477
Devon Energy	-954	-1 773	1 235	-132	-132	169	2 368	-6 065	-173	-182	156
Anadarko Petroleum	2 148	-5	820	-856	1 120	1 165	1 617	-2 877	-1 021	-1 477	733
EOG Resources	1 310	325	247	819	710	1 240	2 080	-2 397	-461	-1 921	822
Apache	220	611	2 174	3 509	2 876	1 928	1 637	-5 469	-442	-585	672
Marathon Oil	3 445	2 257	2 554	2 720	4 531	3 337	392	-754	905	376	331
Imperial Oil	1 142	594	743	1 018	1 232	855	1 065	579	208	73	556
Suncor Energy	813	137	1 558	2 719	2 267	2 317	1 630	-23	-267	1 162	1 239
Husky Energy	1 141	517	385	901	817	751	453	-1 099	21	-289	345
Canadian Natural Resources	1 868	378	1 180	1 246	720	720	1 064	-22	-640	379	682
Royal Dutch Shell	24 344	8 302	14 870	24 475	23 449	17 066	13 584	-153	829	4 695	11 715
BP	12 617	8 365	-1 501	12 737	6 993	6 463	947	-3 171	-2 467	3 712	7 145
TOTAL	19 687	11 166	13 667	18 209	17 239	15 322	8 614	1 653	970	3 029	6 516
Eni	13 488	9 733	12 236	13 811	15 383	12 423	7 882	3 426	2 041	4 158	6 836
Equinor (Statoil)	19 603	16 822	16 933	22 594	24 648	16 306	11 759	4 722	2 724	8 822	11 335
PetroChina	5 147	4 902	5 815	6 072	5 758	5 874	6 166	2 422	2 273	2 494	6 235
Sinopec	-276	2 356	3 879	4 145	3 794	4 064	2 872	1 942	2 985	2 491	2 945
CNOOC	1 979	1 661	2 764	3 545	4 250	4 029	3 596	-481	-852	1 795	3 271
Petrobras	9 259	5 238	6 356	6 732	3 562	2 578	-1 321	-1 137	684	1 828	4 684
PJSC Gazprom	10 452	6 026	8 183	8 672	9 089	6 168	2 157	1 403	3 596	4 198	4 005
PJSC NK Rosneft	1 904	2 000	2 644	3 117	3 128	2 475	2 275	1 427	1 912	1 701	2 634
PJSC LUKOIL	4 167	1 922	2 104	2 678	2 738	2 051	2 876	1 377	959	1 736	1 973
Average value	8 284	4 465	5 786	8 204	7 602	5 941	4 221	-28	414	1 405	3 691

Source: Authoring, based on [19, 20]

Table 13

Interest expenses of the twenty five leading publicly traded oil and gas corporations in 2008–2018, million USD

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	673	548	259	247	327	9	286	311	453	601	766
Chevron	0	28	50	0	0	0	0	0	201	307	748
ConocoPhillips	935	1 289	1 187	972	709	612	648	920	1 245	1 098	735
Occidental Petroleum	129	140	116	298	130	118	77	147	292	345	389
Devon Energy	329	349	363	352	406	437	536	523	904	491	298
Anadarko Petroleum	742	702	855	839	742	686	772	825	890	932	947

EOG Resources	52	101	130	210	214	235	201	237	282	274	245
Apache	186	249	225	170	175	197	136	259	416	406	397
Marathon Oil	114	69	101	130	232	286	277	332	379	377	248
Imperial Oil	0	0	0	0	0	0	0	25	54	52	77
Suncor Energy	0	418	390	100	56	288	265	306	309	172	543
Husky Energy	130	169	202	138	59	-31	8	103	188	218	155
Canadian Natural Resources	105	392	457	385	368	265	291	270	321	580	585
Royal Dutch Shell	1 181	542	996	1 373	1 757	1 642	1 804	1 888	3 203	4 042	3 745
BP	1 157	718	701	788	842	844	840	886	977	1 421	1 779
TOTAL	1 392	764	621	923	885	924	748	967	1 108	1 396	1 933
Eni	1 054	764	774	1 000	1 095	1 038	922	739	686	813	725
Equinor (Statoil)	373	593	317	625	449	230	511	443	1 043	903	1 040
PetroChina	434	772	954	1 728	2 890	3 788	3 811	3 746	3 566	3 429	3 257
Sinopec	1 657	1 081	1 204	1 467	1 785	1 740	1 833	1 252	1 617	1 094	1 067
CNOOC	5	10	58	70	45	257	385	569	524	371	360
Petrobras	184	296	889	463	1 318	1 665	3 173	5 085	6 035	5 412	4 206
PJSC Gazprom	2 039	2 452	1 270	994	1 218	1 307	795	917	1 180	926	725
PJSC NK Rosneft	1 112	605	580	320	263	1 344	1 546	2 072	2 918	3 455	3 368
PJSC LUKOIL	391	667	712	694	538	488	637	605	664	401	463
Average value	575	549	536	571	660	735	820	937	1 170	1 181	1 152

Source: Authoring, based on [19, 20]

Table 14

Enterprise value to net cash from operating activities ratio of the twenty five leading publicly traded oil and gas corporations in 2008–2018

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	6.28	11.30	7.67	7.33	6.97	10.17	9.15	11.83	18.73	13.09	8.99
Chevron	4.97	8.06	5.75	4.99	5.20	6.95	7.17	10.12	20.37	13.27	7.58
ConocoPhillips	4.56	8.34	6.55	5.63	6.38	6.34	6.13	10.59	19.46	11.02	6.19
Occidental Petroleum	4.65	11.63	8.80	6.36	5.99	6.13	5.89	16.96	18.33	12.91	6.95
Devon Energy	3.67	8.39	6.67	4.70	5.60	5.71	5.81	4.41	18.37	10.13	6.11
Anadarko Petroleum	4.03	9.77	8.98	20.19	5.76	5.61	5.85	-21.05	16.86	9.88	6.17
EOG Resources	3.93	9.13	10.21	6.75	7.30	6.88	6.28	12.48	27.00	15.94	7.12
Apache	4.06	8.93	7.97	4.19	5.05	4.25	4.03	8.08	12.85	9.43	4.59
Marathon Oil	3.72	5.42	5.15	3.82	6.89	5.84	4.21	9.32	18.12	9.08	4.88
Imperial Oil	7.83	21.43	10.88	8.57	7.99	13.94	11.15	21.47	22.05	13.25	7.97
Suncor Energy	6.59	27.73	12.95	5.28	6.38	6.07	6.84	9.14	15.43	9.89	7.14
Husky Energy	4.01	14.81	10.20	5.08	5.99	7.84	5.66	5.69	10.70	5.82	3.94
Canadian Natural Resources	5.82	8.75	9.05	8.07	6.44	6.75	6.29	8.84	18.63	10.64	5.94
Royal Dutch Shell	3.74	9.70	8.57	6.97	5.15	6.54	5.29	5.81	14.67	9.64	5.51
BP	4.43	7.54	12.11	7.50	7.95	8.41	4.34	6.58	15.79	10.01	7.91
TOTAL	5.30	8.79	6.03	5.59	4.71	5.57	5.81	6.93	9.48	7.10	6.62
Eni	3.65	7.87	5.81	5.99	6.72	7.65	4.97	6.07	10.07	6.63	4.73
Equinor (Statoil)	4.13	7.42	6.54	5.25	3.89	5.60	2.72	3.66	9.58	6.62	4.52
PetroChina	10.94	9.77	7.04	6.89	8.58	6.35	6.62	7.31	6.84	4.77	4.49
Sinopec	11.50	8.53	5.07	5.47	6.12	5.46	7.06	4.59	3.31	4.06	3.70
CNOOC	5.00	9.00	8.30	4.35	6.54	5.59	4.48	5.67	7.20	5.67	4.84
Petrobras	3.87	9.63	9.83	6.51	7.43	7.23	6.14	4.90	6.17	5.60	5.76
PJSC Gazprom	3.52	6.20	3.64	3.04	3.04	2.46	2.42	2.56	3.40	4.45	3.96
PJSC NK Rosneft	4.10	9.83	5.82	5.20	6.12	3.92	3.14	2.48	10.90	20.08	5.41
PJSC LUKOIL	2.47	6.36	3.93	3.05	2.82	3.41	2.59	2.68	3.85	3.50	3.50
Average value	5.07	10.17	7.74	6.27	6.04	6.43	5.60	6.69	13.53	9.30	5.78

Source: Authoring, based on [19, 20]

Table 15

Proved reserves life of hydrocarbons of the twenty five leading publicly traded oil and gas corporations in 2008–2018, years

Company	31.12. 2008	31.12. 2009	31.12. 2010	31.12. 2011	31.12. 2012	31.12. 2013	31.12. 2014	31.12. 2015	31.12. 2016	31.12. 2017	31.12. 2018
ExxonMobil	16.02	16.02	15.28	15.16	16.22	16.55	17.44	16.56	13.47	14.59	17.14
Chevron	12.09	11.46	10.46	11.52	11.88	11.82	11.83	11.67	11.71	11.72	11.27
ConocoPhillips	12.32	12.37	10.95	14.19	14.96	15.82	15.84	14.1	11.19	10.02	11.24
Occidental Petroleum	13.49	13.74	12.24	11.87	11.76	12.51	12.94	9.02	10.43	11.82	11.46
Devon Energy	10.2	11.73	12.6	12.51	11.87	11.72	11.21	8.79	9.2	10.86	9.87
Anadarko Petroleum	11.05	10.45	10.32	10.23	9.56	9.79	9.29	6.74	5.93	5.87	6.06
EOG Resources	11.94	13.94	13.82	13.31	10.61	11.38	11.5	10.14	10.47	11.37	11.15
Apache	12.27	11.12	12.3	10.95	10.01	9.53	10.03	7.67	6.87	7.04	7.26
Marathon Oil	8.71	11.41	10.89	12.36	11.7	12.24	13.12	13.81	14.57	10	8.36
Imperial Oil	16.39	26.79	28.39	36.13	40.19	38.31	41.24	34.16	10.61	12.84	30.35
Suncor Energy	22.73	21.34	14.59	17.02	17.45	20.44	20.59	19.29	19.35	17.09	15.36
Husky Energy	7.56	8.7	9.28	9.61	9.76	10.41	10.12	6.73	6.45	10.95	8.4
Canadian Natural Resources	22.07	18.56	18.45	20.71	19.2	19.46	18.08	17.25	19.19	24.42	23.69
Royal Dutch Shell	10.31	12.33	11.8	12.16	11.37	11.94	11.64	10.89	9.87	9.15	8.65
BP	12.92	12.54	12.95	14.08	13.94	15.26	15.24	14.36	14.89	14.05	14.84
TOTAL	12.21	12.59	12.32	13.34	13.5	13.74	14.71	13.52	12.83	12.25	11.9
Eni	10.03	10.18	10.33	12.75	11.51	11.06	11.32	10.73	11.63	10.55	10.59
Equinor (Statoil)	7.93	7.55	7.73	8.04	7.39	7.91	7.62	7.03	6.92	7.07	8.01
PetroChina	18.13	18.24	18.08	17.3	16.59	15.98	15.48	14.35	14.02	13.92	13.67
Sinopec	11.58	11.23	9.87	9.72	9.26	9.52	8.69	7.43	6.37	6.16	6.2
CNOOC	12.95	11.67	9.11	9.61	10.2	10.76	10.35	8.71	8.13	10.3	9.65
Petrobras	12.74	13.17	13.52	13.45	13.55	14.15	13.48	10.34	9.47	9.66	10.02
PJSC Gazprom	32.89	39.46	36.66	36.75	38.22	37.7	40.71	41.86	41.44	36.73	34.28
PJSC NK Rosneft	17.01	17.39	16.52	18.67	19.24	18.56	18.21	18.32	19.25	19.12	19.59
PJSC LUKOIL	23.67	21.24	20.7	21.3	21.13	20.89	20.04	18.61	19.69	19.34	18.6
Average value	14.37	15.01	14.37	15.31	15.24	15.5	15.63	14.08	12.96	13.08	13.5

Source: Authoring, based on [19, 20]

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Conflict-of-interest notification

I, the author of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.