



ENGINEERING STUDY

17th Annual



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A&E INDUSTRY PRACTICE

SOLUTIONS AND EXPERTISE

Managing a successful engineering firm in today's complex business environment is more challenging than ever. At DGC (DiCicco, Gulman & Company LLP), we are uniquely qualified to meet clients' needs with a dedicated team of professionals who specialize in the A&E industry. For our A&E clients, we pride ourselves on speaking their language, understanding their business, and our ability to offer solutions to improve profitability and firm value. This informed team approach enables us to meet the diverse needs of A&E firms and help them navigate the current and future financial and tax landscape.

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- Tax planning (business & individual)
- Multi-state tax services
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INTRODUCTION

DGC is pleased to publish our 17th annual Engineering Study. This is a unique year because the benchmarking data included in this study is from 2020. The COVID-19 pandemic and COVID-related relief programs like the Paycheck Protection Program impacted the results of this study dramatically. However, we believe that this data will still be useful for you and your firm moving forward.

We have gathered data from our survey participants and analyzed key performance indicators such as utilization rates, billing multiples, overhead costs, and working capital ratios. This annual study provides engineering firms with an indication of where they stand relative to their peers.

All of the data included in this study has been affected by the pandemic, but some metrics showed a significant change when compared to their 2019 levels. For example, the breakeven multiple and overhead rate decreased significantly due to fewer expenses incurred because of the shift to remote work. On the contrary, the working capital to net fee income ratio increased due to the economic uncertainty resulting from the pandemic, which prompted firms to keep more working capital within the firm.

On behalf of our DGC team, we wish you good health and continued success in 2022. We look forward to discussing pertinent topics with you as they come up throughout the year. We encourage you to give us feedback about any additional industry and financial information that you would like us to incorporate into next year's Engineering Study.

Thanks to our clients who participated in this year's study. We appreciate your contributions to this project and value our relationship with you. Be sure to save the date for our 2022 A&E Summit on Friday, June 24, 2022 at the Langham Hotel in Boston.



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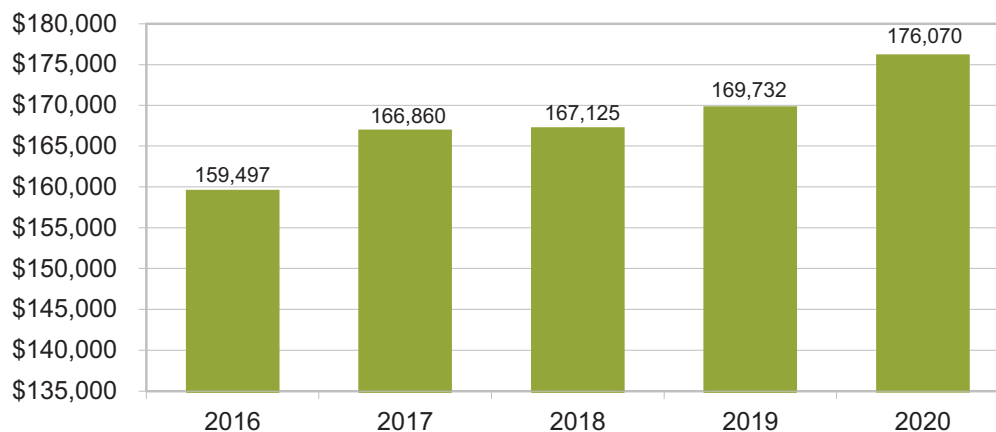
	Study Average	Range of Studied Firms	
		High	Low
Ratios based on labor dollars			
Direct ratio (utilization)	61.2%	71.7%	49.8%
Total labor billing multiple	1.89	2.53	1.64
Direct labor billing multiple	3.10	3.79	2.42
Breakeven multiple*	2.65	2.96	2.04
Overhead rate*	165.0%	195.8%	103.8%
Ratios based on hours			
Direct ratio (utilization)	64.7%	73.5%	49.4%
Billing rate per direct hour	\$ 138.54	\$ 186.79	\$ 115.66
Overhead rate per direct hour	\$ 70.44	\$ 93.88	\$ 53.24
Employees' average hourly rates			
Direct labor rate	\$ 46.48	\$ 62.24	\$ 38.56
Indirect labor rate	\$ 51.52	\$ 58.04	\$ 34.16
Combined labor rate	\$ 47.86	\$ 55.55	\$ 39.45
Calculation of profit per direct hour			
Billing rate per direct hour	\$ 138.54		
Direct labor rate	\$ (46.48)		
Overhead rate per direct hour	\$ (70.44)		
Profit per direct hour	\$ 21.62	\$ 40.57	\$ 3.74
Profitability ratios			
Profit as a % of net fee income **	15.6%	29.3%	2.0%
Net fee income per employee	\$ 176,070	\$ 239,195	\$ 146,099

* Breakeven multiple and overhead rate include staff bonuses.

** Profit as a % of net fee income is calculated before bonuses to principal owners.

	2016	2017	2018	2019	2020
Ratios based on labor dollars					
Direct ratio (utilization)	59.6%	60.5%	60.6%	60.9%	61.2%
Total labor billing multiple	1.86	1.88	1.85	1.86	1.89
Direct labor billing multiple	3.07	3.11	3.06	3.08	3.10
Breakeven multiple	2.69	2.67	2.75	2.72	2.65
Overhead rate	169.4%	166.9%	174.6%	172.4%	165.0%
Ratios based on hours					
Direct ratio (utilization)	62.3%	62.4%	62.8%	63.4%	64.7%
Billing rate per direct hour	\$ 126.86	\$ 130.35	\$ 132.74	\$ 137.92	\$ 138.54
Overhead rate per direct hour	\$ 69.16	\$ 67.27	\$ 70.39	\$ 72.45	\$ 70.44
Employees' average hourly rates					
Direct labor rate	\$ 43.24	\$ 43.51	\$ 44.11	\$ 45.51	\$ 46.48
Indirect labor rate	\$ 48.12	\$ 50.51	\$ 51.26	\$ 50.92	\$ 51.52
Combined labor rate	\$ 45.54	\$ 46.50	\$ 47.24	\$ 47.68	\$ 47.86
Calculation of profit per direct hour					
Billing rate per direct hour	\$ 126.86	\$ 130.35	\$ 132.74	\$ 137.92	\$ 138.54
Direct labor rate	\$ (43.24)	\$ (43.51)	\$ (44.11)	\$ (45.51)	\$ (46.48)
Overhead rate per direct hour	\$ (69.16)	\$ (67.27)	\$ (70.39)	\$ (72.45)	\$ (70.44)
Profit per direct hour	\$ 14.46	\$ 19.57	\$ 18.24	\$ 19.96	\$ 21.62
Profitability ratios					
Profit as a % of net fee income	11.4%	15.0%	13.7%	14.5%	15.6%

Net Fee Income Per Employee

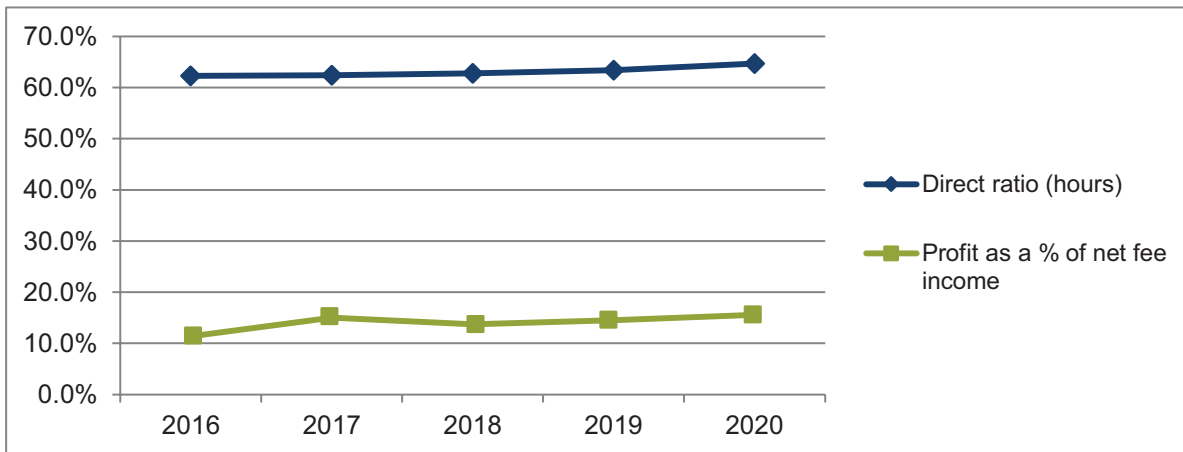


	2016	2017	2018	2019	2020
Total firm					
Direct hours	<u>62.3%</u>	<u>62.4%</u>	<u>62.8%</u>	<u>63.4%</u>	<u>64.7%</u>
Indirect hours:					
Holiday, vacation, sick	10.3%	11.0%	10.7%	10.7%	10.1%
Marketing	5.3%	7.0%	7.2%	6.8%	6.4%
Other	<u>22.1%</u>	<u>19.6%</u>	<u>19.3%</u>	<u>19.1%</u>	<u>18.8%</u>
	<u>37.7%</u>	<u>37.6%</u>	<u>37.2%</u>	<u>36.6%</u>	<u>35.3%</u>
Total	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>
Principals					
Direct hours	<u>46.0%</u>	<u>45.3%</u>	<u>47.1%</u>	<u>49.5%</u>	<u>50.5%</u>
Indirect hours:					
Holiday, vacation, sick	11.4%	13.3%	12.7%	12.9%	10.7%
Marketing	14.8%	14.8%	14.2%	13.4%	10.8%
Other	<u>27.8%</u>	<u>26.6%</u>	<u>26.0%</u>	<u>24.2%</u>	<u>28.0%</u>
	<u>54.0%</u>	<u>54.7%</u>	<u>52.9%</u>	<u>50.5%</u>	<u>49.5%</u>
Total	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>
Professional staff					
Direct hours	<u>74.3%</u>	<u>75.7%</u>	<u>73.6%</u>	<u>75.4%</u>	<u>72.0%</u>
Indirect hours:					
Holiday, vacation, sick	9.9%	11.2%	11.0%	11.0%	10.0%
Marketing	4.1%	4.9%	4.8%	3.8%	4.3%
Other	<u>11.7%</u>	<u>8.2%</u>	<u>10.6%</u>	<u>9.8%</u>	<u>13.7%</u>
	<u>25.7%</u>	<u>24.3%</u>	<u>26.4%</u>	<u>24.6%</u>	<u>28.0%</u>
Total	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>
Support staff					
Direct hours	<u>6.0%</u>	<u>5.2%</u>	<u>5.8%</u>	<u>4.3%</u>	<u>5.4%</u>
Indirect hours:					
Holiday, vacation, sick	10.3%	10.7%	10.6%	11.1%	9.7%
Marketing	7.6%	8.1%	10.9%	11.8%	9.7%
Other	<u>76.1%</u>	<u>76.0%</u>	<u>72.7%</u>	<u>72.8%</u>	<u>75.2%</u>
	<u>94.0%</u>	<u>94.8%</u>	<u>94.2%</u>	<u>95.7%</u>	<u>94.6%</u>
Total	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>

Direct Ratio & Profit as a % of Net Fee Income

The direct ratio represents the percentage of total hours that are chargeable to projects. Maintaining a high percentage here can be the key to a firm's profitability. Profit as a % of net fee income represents the ratio of income from operations to net fee income.

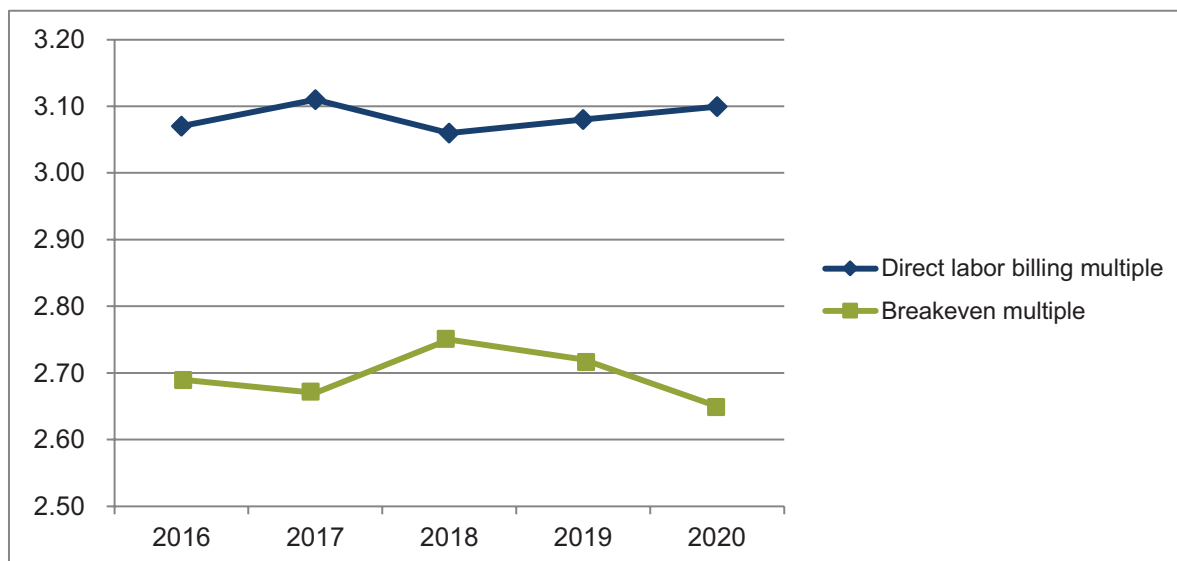
	2016	2017	2018	2019	2020
Direct ratio (hours)	62.3%	62.4%	62.8%	63.4%	64.7%
Profit as a % of net fee income	11.4%	15.0%	13.7%	14.5%	15.6%



Direct Labor Billing Multiple & Breakeven Multiple

The direct labor billing multiple is calculated by dividing net fee income by direct labor cost. This ratio represents the average amount billed as a multiple of direct labor. The breakeven multiple is calculated by dividing total operating costs (including direct labor) by direct labor. This ratio multiplied by an employee's pay rate is the amount that needs to be billed out to cover their salary and overhead (breakeven). Both ratios are heavily influenced by a firm's direct ratio.

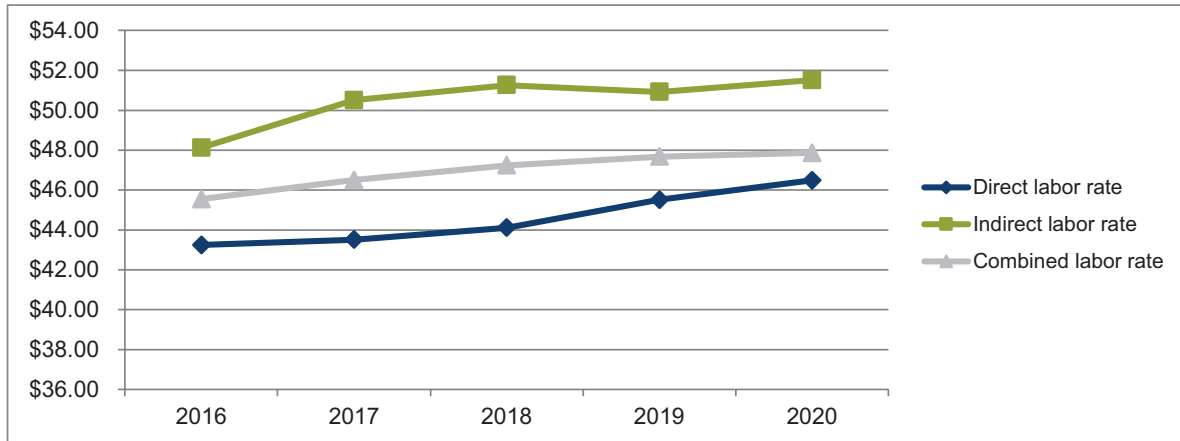
	2016	2017	2018	2019	2020
Direct labor billing multiple	3.07	3.11	3.06	3.08	3.10
Breakeven multiple	2.69	2.67	2.75	2.72	2.65



Employee's Average Hourly Rates

Direct labor divided by direct hours represents the average wage rate for each direct hour worked. Indirect labor divided by indirect hours represents the average wage rate for each indirect hour worked. Total labor divided by total hours represents the average wage rate for an hour worked.

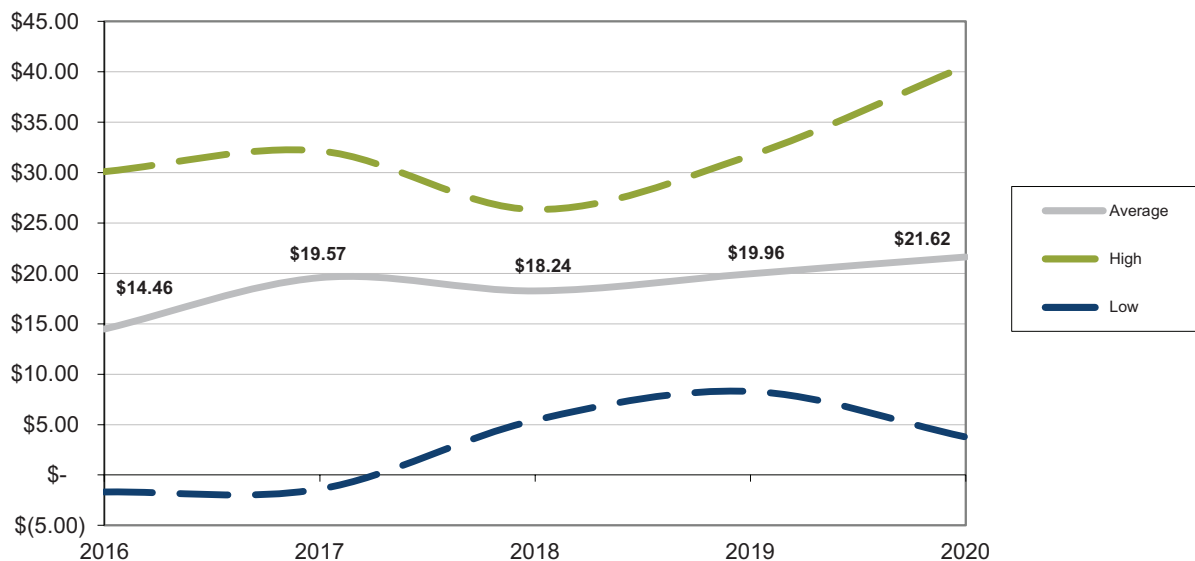
	2016	2017	2018	2019	2020
Direct labor rate	\$ 43.24	\$ 43.51	\$ 44.11	\$ 45.51	\$ 46.48
Indirect labor rate	\$ 48.12	\$ 50.51	\$ 51.26	\$ 50.92	\$ 51.52
Combined labor rate	\$ 45.54	\$ 46.50	\$ 47.24	\$ 47.68	\$ 47.86



Profit (Loss) per Direct Hour

Profit (loss) per direct hour is calculated by dividing income from operations by the direct hours charged to projects.

	2016	2017	2018	2019	2020
Average	\$ 14.46	\$ 19.57	\$ 18.24	\$ 19.96	\$ 21.62
High	\$ 30.10	\$ 32.13	\$ 26.32	\$ 31.70	\$ 40.57
Low	\$ (1.70)	\$ (1.42)	\$ 5.43	\$ 8.28	\$ 3.74

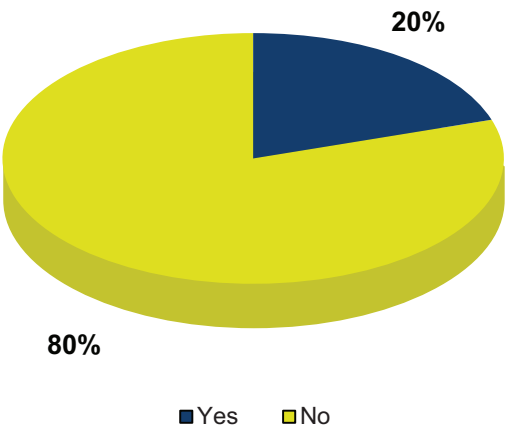


This graph shows the study average profit per direct hour (in gray), the study high for each year (in green) and the study low for each year (in blue).

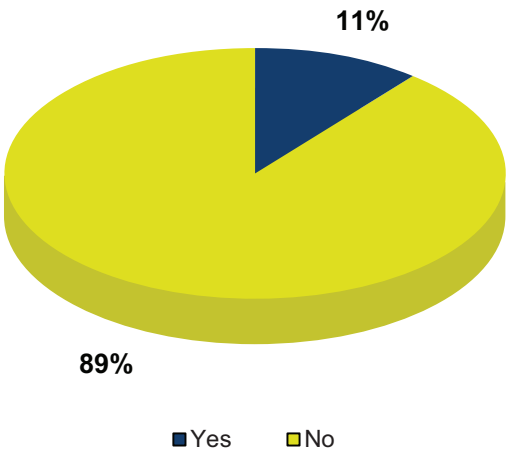
The following table is presented to show additional firm statistics, including various compensation rates, billing rates and the percentage change in the volume of business.

	Study Average	2020		2019
		Range of Studied Firms High	Low	Study Average
Ratio of shareholders to total employees	25.7%	66.5%	7.1%	23.6%
Staff turnover ratio	14.5%	28.0%	6.0%	10.9%
Ratio of non-technical employees to total employees				
Administration	3.8%	7.1%	2.0%	4.6%
Finance/accounting	4.6%	8.3%	2.5%	4.2%
Human resources	1.9%	8.3%	0.0%	1.4%
Information technology	2.6%	3.6%	0.0%	2.4%
Marketing	3.2%	7.1%	0.0%	2.9%
Raises as a percentage of base compensation	3.6%	5.0%	2.5%	4.0%
Staff bonuses as a percentage of base compensation	6.3%	15.0%	3.0%	8.0%
Billing rates				
Principals	\$ 255	\$ 360	\$ 175	\$ 250
Project managers	\$ 190	\$ 250	\$ 155	\$ 185
Senior engineers	\$ 165	\$ 195	\$ 130	\$ 165
Engineers	\$ 140	\$ 160	\$ 110	\$ 140
Technical professionals/draftspersons	\$ 105	\$ 135	\$ 75	\$ 100
Base salary (before bonuses), professional staff				
Principals	\$ 186,000	\$ 260,000	\$ 133,000	\$ 180,000
Project managers	\$ 135,600	\$ 145,000	\$ 92,000	\$ 130,000
Senior engineers	\$ 96,000	\$ 106,000	\$ 76,900	\$ 92,000
Engineers	\$ 78,000	\$ 90,000	\$ 62,000	\$ 70,000
Technical professionals/draftspersons	\$ 66,000	\$ 80,000	\$ 54,000	\$ 60,000
Base salary (before bonuses), support staff				
CFO	\$ 216,000	\$ 285,000	\$ 202,000	\$ 209,500
Marketing director	\$ 167,500	\$ 224,000	\$ 101,000	\$ 164,500
Human resources director	\$ 176,000	\$ 215,000	\$ 117,000	\$ 164,250
Controller	\$ 142,200	\$ 192,000	\$ 90,000	\$ 134,500
Information technology director	\$ 150,000	\$ 225,000	\$ 126,000	\$ 148,000
Growth percentages from prior year				
Change in total hours	3.6%	39.0%	-10.9%	3.1%
Change in direct hours	2.4%	33.6%	-5.3%	4.5%
Change in gross billings	1.4%	12.8%	-9.1%	7.5%
Change in net fee income	2.9%	17.1%	-7.3%	6.3%
Change in total expenses	2.3%	14.3%	-6.6%	6.4%

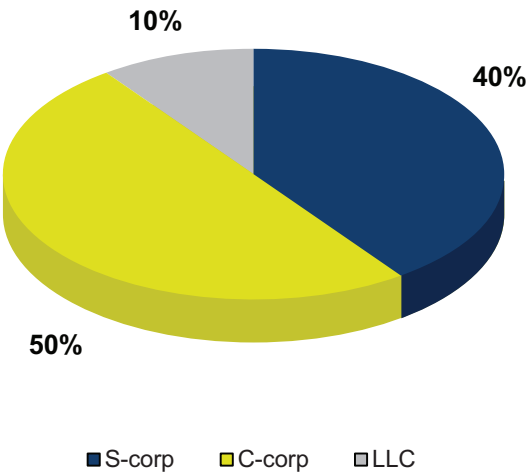
% of Firms Outsourcing Design Work



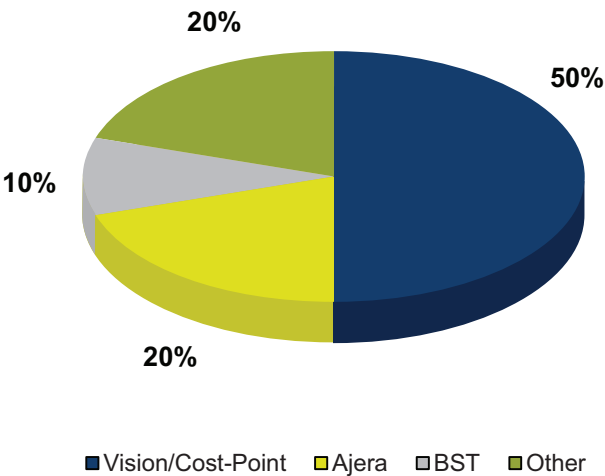
% of Firms Operating in Foreign Countries



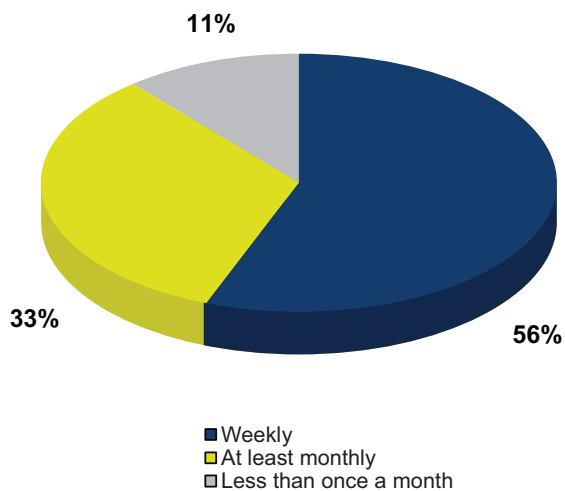
Legal Entity Type



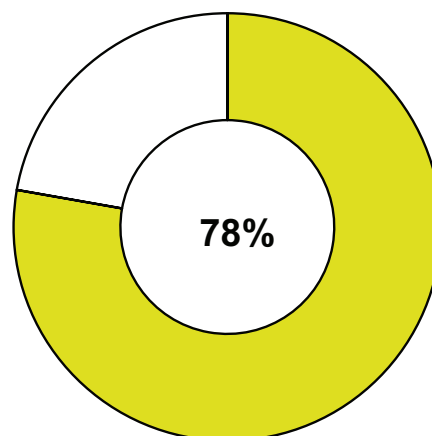
Accounting Software Used



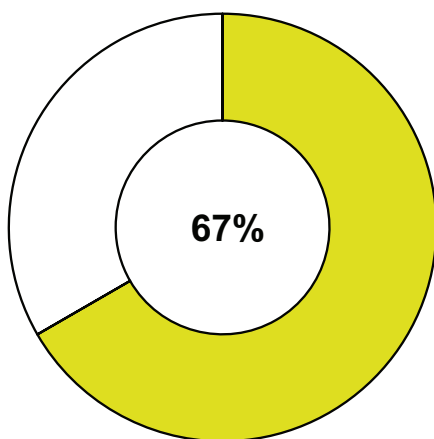
Frequency of Project Budget Review Meetings



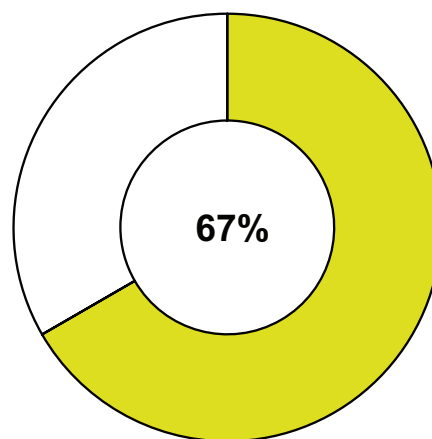
% of Firms with a Total Time Reporting Policy



% of Firms with Mandatory Stock Redemption Age



% of Firms Actively Transitioning Ownership



Common size income statements are a valuable means of comparing different size firms. The table shows the income statement based on a percentage of net fee income.

Based on Net Fee Income

		2020		2019
	Study Average	Range of Studied Firms		Study Average
		High	Low	
Gross fee income	100.0%			100.0%
Direct consultants and reimbursables	13.7%	30.7%	5.1%	14.7%
Net fee income	86.3%	94.9%	69.3%	85.3%
Net fee income	100.0%			100.0%
Direct labor	32.7%	41.4%	26.4%	32.0%
Gross margin	67.3%	73.6%	58.6%	68.0%
Indirect payroll	22.0%	30.7%	13.1%	21.8%
Staff bonuses	4.6%	16.9%	1.1%	3.9%
Employee and fringe benefits	12.3%	16.5%	7.3%	12.2%
Rent and utilities	4.6%	8.3%	3.8%	4.4%
Other indirect	8.2%	17.7%	7.2%	11.2%
Total	51.7%	64.7%	38.4%	53.5%
Profit from operations	15.6%	29.3%	2.0%	14.5%

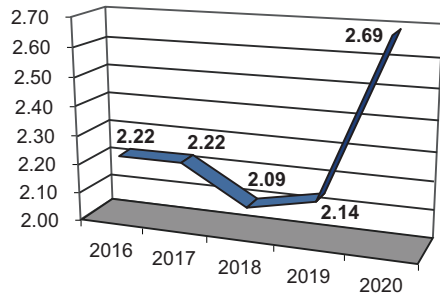
The overhead rate per direct hour equals total indirect expenses divided by direct labor hours. It represents the amount of overhead a firm is sustaining in order to support its volume of business.

	Study Average	
	2020	2019
Labor		
Indirect labor	\$ 28.50	\$ 28.23
Staff bonuses	4.58	4.55
	<u>33.08</u>	<u>32.78</u>
Employee and fringe benefits		
Employee benefits, other	0.12	0.26
Severance	0.03	0.03
Insurance, health	7.60	7.51
Retirement plan contribution	3.05	2.96
Taxes, payroll	6.00	5.85
	<u>16.80</u>	<u>16.61</u>
Bid & proposal and marketing	<u>0.40</u>	<u>0.73</u>
Depreciation and amortization	<u>2.34</u>	<u>2.37</u>
Insurance, professional liability and other		
Insurance, other	0.13	0.14
Officers' life and disability insurance	0.26	0.27
Professional liability insurance	1.33	1.23
Workers' compensation	0.17	0.15
	<u>1.89</u>	<u>1.79</u>
Occupancy costs		
Rent	6.10	5.97
Utilities	0.34	0.34
	<u>6.44</u>	<u>6.31</u>
Other indirect		
Administrative service fees	0.25	0.26
Bad debts	0.19	0.20
Computer and IT	3.94	3.02
Contributions	0.08	0.09
Dues and subscriptions	0.51	0.54
Office supplies and expenses	1.10	1.51
Postage and shipping	0.11	0.14
Printing and reproduction	0.07	0.09
Professional fees	2.07	1.91
Recruiting	0.40	0.49
Repairs and maintenance	0.20	0.22
Seminars and conferences	0.19	0.37
Taxes, other	0.08	0.09
Telephone	0.53	0.55
Temporary employment and fees	0.08	0.12
Travel and entertainment	1.04	2.85
Expense recovery	(0.42)	(0.55)
Miscellaneous and rounding	(0.93)	(0.04)
	<u>9.49</u>	<u>11.86</u>
Total	<u>\$ 70.44</u>	<u>\$ 72.45</u>

The overhead rate percentage equals indirect expenses divided by direct labor cost. The following chart shows how each indirect expense category contributes to the overall overhead rate.

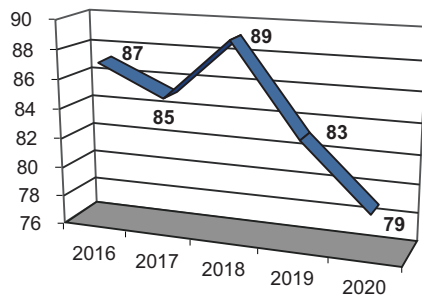
	Study Average	
	2020	2019
Labor		
Indirect labor	68.1%	67.9%
Staff bonuses	10.4%	10.1%
	78.5%	78.0%
Employee and fringe benefits		
Employee benefits, other	0.5%	0.7%
Severance	0.1%	0.0%
Insurance, health	17.5%	17.3%
Retirement plan contribution	5.7%	5.7%
Taxes, payroll	13.2%	13.2%
	37.0%	36.9%
Bid & proposal and marketing	0.9%	1.5%
Depreciation and amortization	6.3%	7.1%
Insurance, professional liability and other		
Insurance, other	1.0%	1.3%
Officers' life and disability insurance	0.6%	0.7%
Professional liability insurance	3.1%	3.0%
Workers' compensation	0.3%	0.3%
	5.0%	5.3%
Occupancy costs		
Rent	15.3%	14.8%
Utilities	0.7%	0.8%
	16.0%	15.6%
Other indirect		
Administrative service fees	0.4%	0.5%
Bad debts	0.5%	0.6%
Computer and IT	8.7%	7.5%
Contributions	0.1%	0.2%
Dues and subscriptions	0.8%	1.1%
Office supplies and expenses	1.9%	3.4%
Postage and shipping	0.2%	0.3%
Printing and reproduction	0.2%	0.3%
Professional fees	4.8%	4.6%
Recruiting	0.7%	1.2%
Repairs and maintenance	0.5%	0.7%
Seminars and conferences	0.6%	1.3%
Taxes, other	0.2%	0.3%
Telephone	1.3%	1.6%
Temporary employment and fees	0.1%	0.2%
Travel and entertainment	2.3%	5.6%
Expense recovery	-1.2%	-1.6%
Miscellaneous and rounding	-0.8%	0.2%
	21.3%	28.0%
Total	165.0%	172.4%

Current Ratio	2016	2017	2018	2019	2020
	2.22	2.22	2.09	2.14	2.69



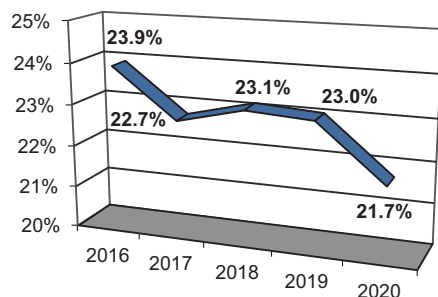
The current ratio is calculated as current assets divided by current liabilities and is an indicator of a firm's ability to meet its current obligations.

Days Fees in Accounts Receivable	2016	2017	2018	2019	2020
	87	85	89	83	79



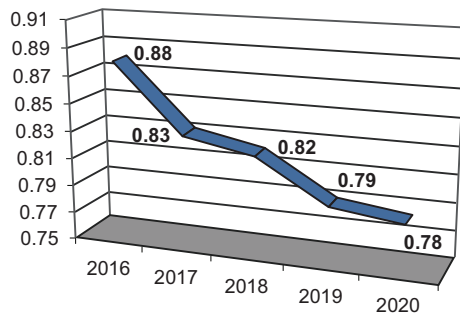
Days fees in accounts receivable represent the average collection period for a firm's receivables.

Receivables as a Percentage of Gross Fee	2016	2017	2018	2019	2020
	23.9%	22.7%	23.1%	23.0%	21.7%



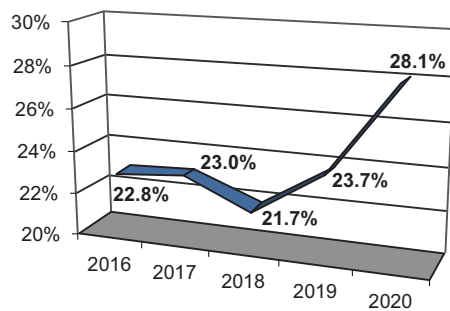
Receivables as a percentage of gross fee show the portion of the year's sales that remain uncollected as of the end of the year. A higher percentage can be due to the nature of a firm's customer base or collection issues.

<i>Debt to Equity</i>	2016	2017	2018	2019	2020
	0.88	0.83	0.82	0.79	0.78



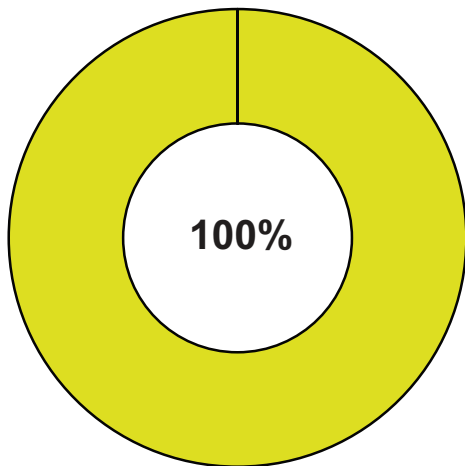
Total liabilities divided by equity. A high debt to equity ratio indicates that a firm has been aggressive in financing its operations with debt. The effects of the PPP loan/income have been excluded from the calculation in 2020.

<i>Working Capital to Net Fee Income</i>	2016	2017	2018	2019	2020
	22.8%	23.0%	21.7%	23.7%	28.1%

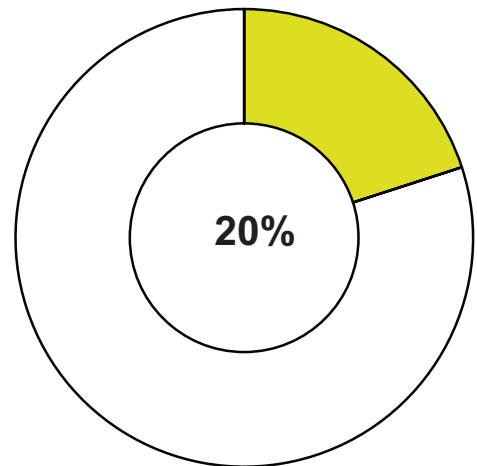


The working capital to net fee income ratio is calculated by dividing working capital (current assets less current liabilities) by net fee income. The ratio is an indicator of whether a firm has retained a sufficient level of capital and liquidity to fund its annual operations. It also helps to assess whether a firm can achieve growth without incurring additional debt.

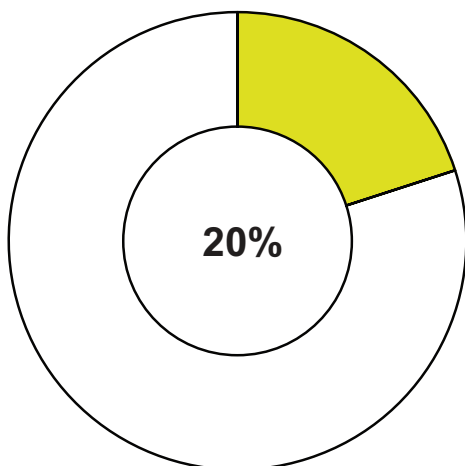
**% of Firms with PPP Loan
and Full Forgiveness
Expected**



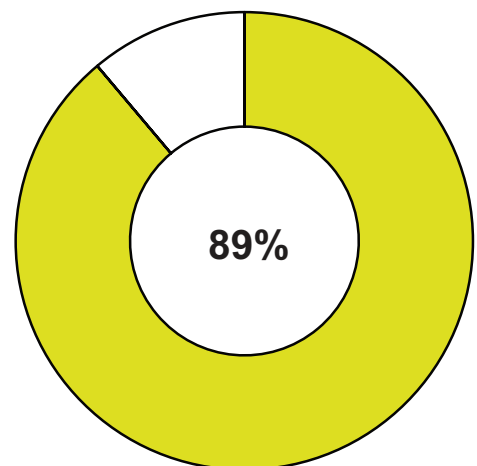
**% of Firms that Performed
Layoffs**



% of Firms that had Pay Cuts



**% of Firms with Majority of
Employees Still Working
From Home**





June 24, 2022

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