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National Press Club
Washington DC
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Environmental Infrastructure Engineering / Consulting Industry Trends, Changes, and Challenges

Presented by Paul Zofnass, President Environmental Financial Consulting Group

EFCG

18th floor New York, NY 10017

www.efcg.com

(212)752-2203 pzofnass@efcg.com



Participants in the 28th Annual EFCG CEO Conference & Survey* New York, NY Oct. 30 – Nov. 2, 2017

Gross Revs		# of Firms	'17 Gross Revs (\$Bil)
> > \$1 Bil		20	81
> \$250 Mil-\$1 Bil		38	18
> \$100 Mil-\$250 Mil		49	8
> \$50 Mil-\$100 Mil		48	3
> \$25 Mil-\$50 Mil		34	1
> < \$25 Mil		41	1
	Total	230	\$112 Billion

^{*}Includes primarily engineering and consulting revenues; ~13% is in construction & EPC

List of ~240 Firms (in '17 Survey) by approx. Rev Size (over \$30 mil only)

AECOM
Suez
Jacobs
Kiewit
SNC Lavalin
CH2M
WSP
Gilbane

Stantec Black & Veatch Tetra Tech HDR

Sweco APTIM Ramboll

AmecFosterWheeler

GHD ICF

CDM Smith Arcadis US EGIS HNTB

Golder Hatch ERM TRC RPS

Kimley-Horn Garney Systra

Berger Chemonics Terracon

Poyry Baker Fugro

Turner & Townsend POWER Engineers Mott MacDonald Multiconsult

STV

Arup (North America) Sargent & Lundy Kleinfelder Calibre

Brown & Caldwell

Setec PM Group IBI

ENVIRON IDOM NV5 NIRAS Geosyntec Carollo Northwind CHA

Enercon Weston Langan BE&K Meinhardt Ausenco Jensen Hugh

Jensen Hughes Hazen & Sawyer

KCI RS&H VHB

Woodard & Curran O'Brien & Gere

GOPA

TranSystems ECS CIMA+

Haley & Aldrich

SCS SSOE Volkert Stanley

Gresham Smith

Woolpert S&ME

EN Engineering

Apex GEI

Moffatt & Nichol

CRB

Freese & Nichol

Barr

EA Engineering Associated Engin.

GAI

Partner Engineering

HAKS

David Evans Braun Intertec Merrick Envirocon

Trinity
Maser

Lochner Charter Heery Mead & Hunt

Psomas

Syska Hennessy

LTK KLJ

Anchor QEA

SWCA

Greeley & Hansen

Vanir ESA Dudek

Weston & Sampson

Roux

Ecology & Envir.

Hanson Parametrix HR Green Strand

Burgess & Niple Wood & Grieve

AKRF

Barge Design COWI NA

McKim & Creed Raba Kistner Wade Trim H2M

EnSafe Ulteig T&M

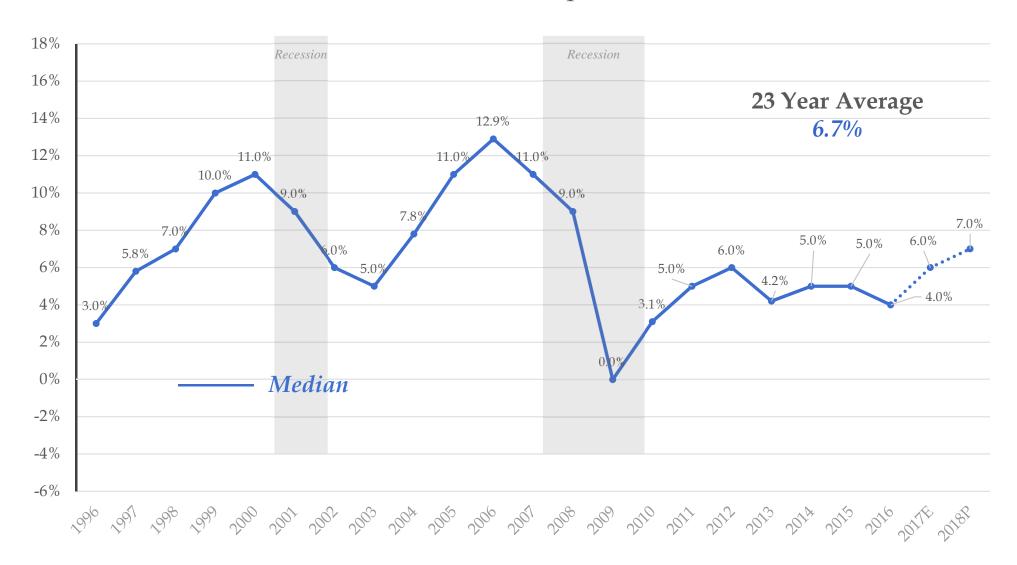
Tighe & Bond

LATA Schnabel Otak Bigen SME

Harris Associates

Internal Growth: Median

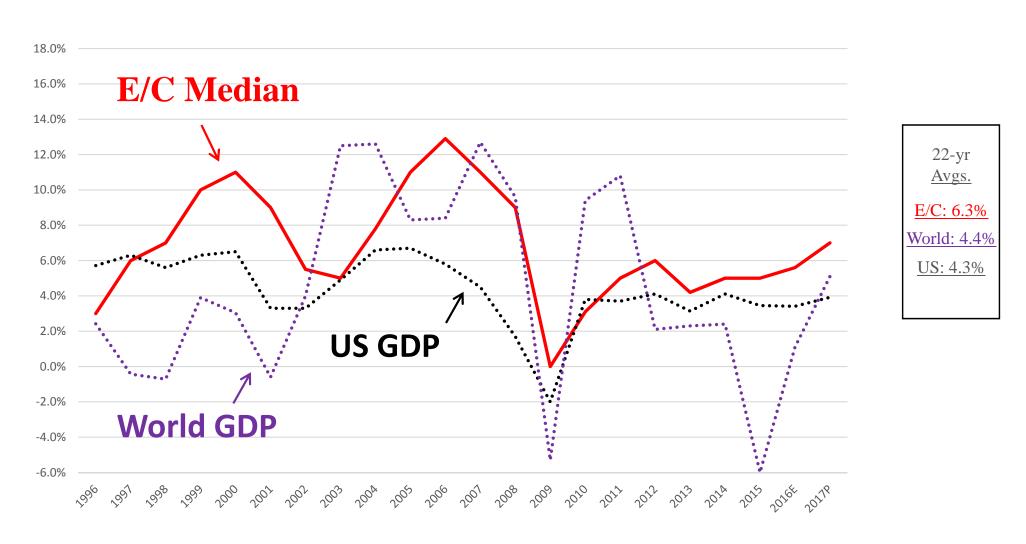
Historical Perspective



• Growing industry, even in recessionary times; never a negative growth year!

E/C Median Growth vs. GDPs

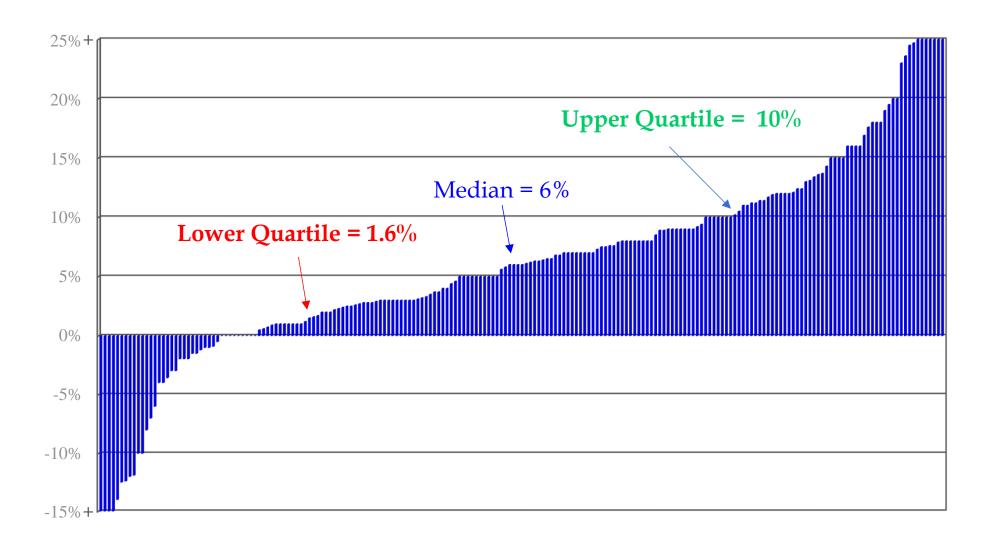
Nominal Growth Rates (in USD)



* E/C industry average growth has been roughly 50% higher than US & World GDP

US & World GDP growth data source: IMF

2017 Internal Growth Distribution



• Median doesn't tell the whole story: huge range; where is your firm? where should it be?

Profitability

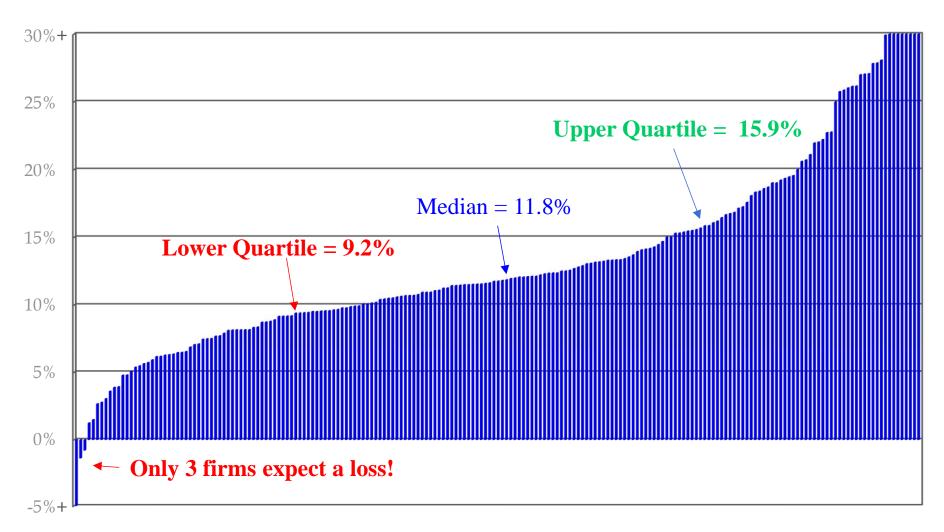
(Median EBIBT / Net Revenues*)



- Significant improvement over 20 years; Why?
- Profit margins decline only slightly during recessions this is a <u>resilient industry!</u>

2017 Profitability Distribution

(EBIBT / Net Revenues)



- •Median, again, doesn't tell the whole story
- •Probably not appropriate to compare your firm vs. all firms
 - -Better to compare by size, business, customer, geography & ownership (Peer Benchmarking Analysis)

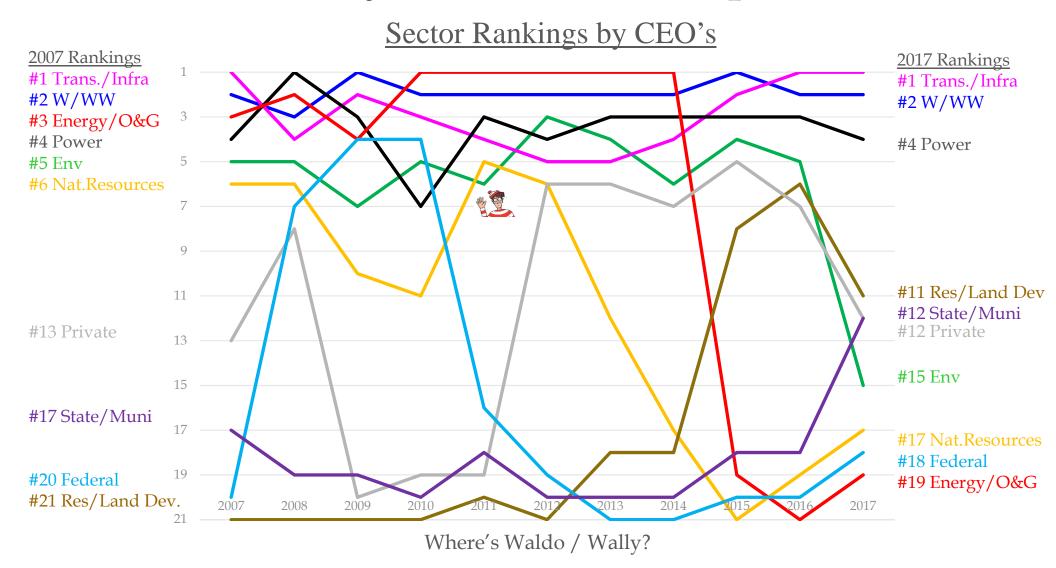
Hot & Cold Analysis*

CEO Opinion Poll (sorted by 2017 "Net Positive Votes")

		2017		
			Net	
	Best	Worst	Positive	Change from 2016
Transport/Infrastructure	111	6	105	27
Water/WW	59	1	58	15
Healthcare/Pharmaceutical	11	1	10	3
Power	12	6	6	-19
CM / PM	7	1	6	5
Sustainability/Resiliency	6	0	6	3
Technology	5	0	5	5
Renewable / Clean Energy	6	2	4	-9
P3	4	0	4	1
Industrial/Commercial Development	2	0	2	4
Residential/Land Development	8	7	1	-9
Municipal	6	6	0	5
Private Customer	1	1	0	-9
Buildings	6	11	-5	-12
Remediation	2	8	-6	-7
Environmental	19	24	-5	-17
Retail	0	10	-10	-10
Nat. Resources/Mining	3	15	-12	1
Federal	1	20	-19	-2
Energy / O&G	23	63	-40	11

^{*} Note: Transportation has been disappointing!)

Hot & Cold Analysis: 10-Year Perspective



- Every sector has its ups and downs
- Argument for diversification?

Who Disappears in 20 Years? All Firms >\$100 Mil Attending 1997 EFCG CEO Conf.)

	1 1	1997 Revs	Current Rev	Ownership
		(in \$Billions)	(S = Sold, B= Bankrupt)	Change
1	CH2M Hill	0.9	S / Jacobs (pending)	*
2	AECOM	0.7	18.0	*
3	Black & Veatch	0.7	3.0	*
4	Dames & Moore	0.7	S / URS / AECOM	*
5	ICF Kaiser	0.5	B/ S/ Earth Tech/ IPO	*
6	Parsons Brinckerhoff	0.5	S / Balfour Beatty / WSP	*
7	Montgomery Watson (MWH Global)	0.5	S / Stantec	*
8	OHM	0.5	S / IT / Shaw / CB&I	*
9	IT Group	0.4	B/S/Shaw/CB&I	*
10	URS	0.4	S / AECOM	*
11	CDM	0.4	1.3	
12	Parsons (Trans)	0.3	3.1 (~.8 Trans)	
13	Tetra Tech	0.3	2.6	
14	ERM	0.3	1.0	*
15	Foster Wheeler Environmental	0.3	S / TTEK	*
16	AWT	0.3	S /Vivendi	*
17	Woodward Clyde	0.3	S / URS / AECOM	*
18	Radian	0.3	S / D&M / URS / AECOM	*
19	Rust	0.3	S / EarthTech / AECOM	*
20	Morrison Knudsen Envir.	0.2	B / S/ Wash/ URS / AECOM	*
21	Arthur D. Little	0.2	В	*
22	Earth Tech	0.2	S /Tyco/ AECOM	*
23	HNTB	0.2	0.9	*
24	HDR	0.2	2.2	*
25	Roy F. Weston	0.2	0.3	*
26	SAIC (Engineering)	0.2	Leidos	*
27	Law	0.2	S / Mactec / Amec	*
28	GTI	0.2	S /FD / IT / Shaw / CB&I	*
29	Metcalf & Eddy	0.2	S / AECOM	*
30	Golder	0.2	0.9	
31	Geraghty & Miller / Arcadis	0.2	Arcadis, US	
32	Smith	0.2	В	*
33	PSI	0.2	S / Intertek	*
34	ENSR	0.2	S / AECOM	*
35	Malcolm Pirnie	0.1	S / Arcadis	*
36	Jacobs (Infra)	0.1	15.0 (~4 Infra)	
37	Emcon	0.1	S / IT / Shaw / CB&I	*
38	Agra E&E	0.1	S / Amec	*
39	Harding Lawson	0.1	S / Mactec / Amec	*
40	Ogden	0.1	S / Agra / Amec	*
41	PBS&J	0.1	S / Atkins	*

Of the 41 firms in 1997 with Revenues > \$100 Mil:

- Only 12 still exist
- Only 6 have same ownership structure

70% of firms no longer around. Why?

 $Red = no \ longer$

THEME #1: Profitability

Why is Profit so Important? Multiplicity of Functions

- 1) Pays for Compensation (Salaries + Bonus); Helps Morale
- 2) Funds Growth (for Working Capital and Acquisitions)
- 3) Funds Internal Ownership Transition ("IOT") (Stock Buyback)
- 4) Provides Buffer for Problems
- 5) Creates Stock Value

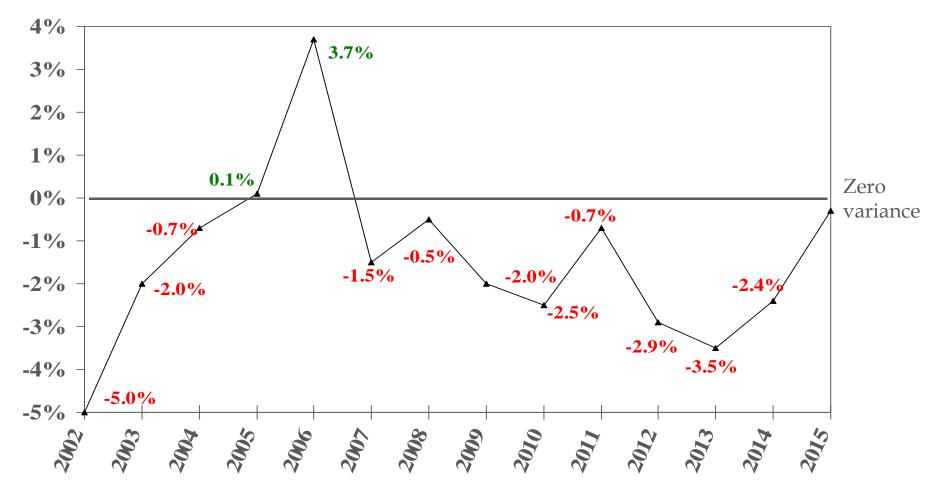
THEME #1: Profitability

How to Improve?

- 1) Better Budgeting / Forecasting / Response to Shortfalls
- 2) Better Management of Overhead (See O/H Analysis)
- 3) Billability of Highest Compensated
- 4) Incentivizing Profitability: "Dividends" vs. "Bonuses"
 - "You get what you incentivize"
- 5) Specialization vs. Diversification
- 6) Balancing Growth & Profit
- 7) Managing Balance Sheet

THEME #2: Importance of Forecasting

How Good Are Your <u>Internal Revenue Growth</u> Estimates for the <u>Current Year?</u> *Variance: Actuals vs. March CFO Estimates*



- Growth estimations (@ March) consistently too high
- Reaction time
- What impact does this "over-forecasting" have on performance?

THEME #2: Importance of Forecasting

Theoretical Impact of an Unanticipated 5% Revenue Shortfall for an e/c firm

• Assumptions: \$100 expected revenue

10% profit margin

Calculation:	Expected	<u>Actual</u>
Revenue	100	95
- Expenses	90	90
= Profit	$\overline{10}$	5

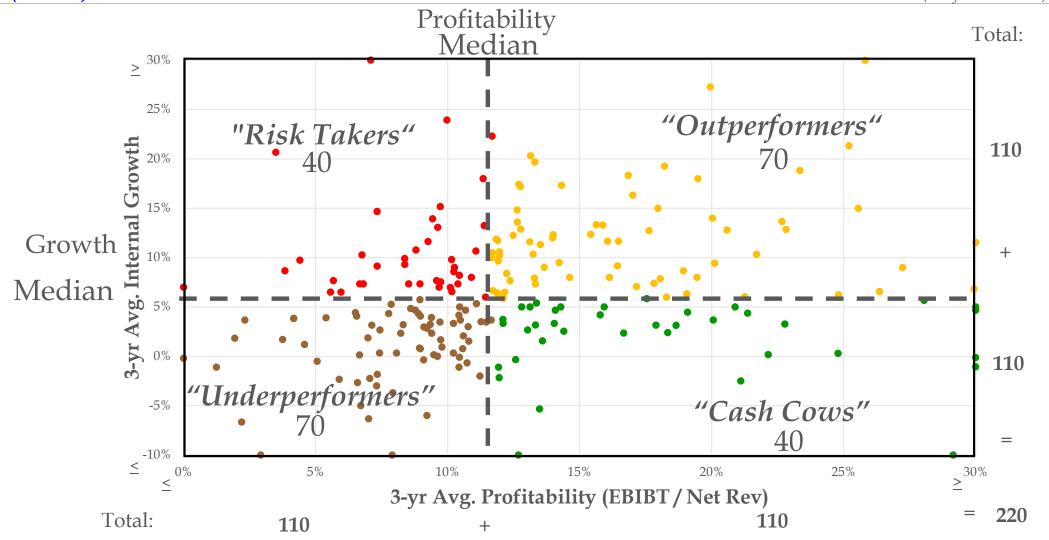
- An unanticipated revenue shortfall of 5% would lead to a profit shortfall of 50%!
- Why so much negative leverage in our business?
 - No inventory (An hour of an engineer's billable time has a very short shelf life)
 - Thin margins
 - Most expenses "fixed"
- How much lead time do you need to cutback cost in response to revenue shortfall?
- Consider "Efficiency Budgeting" (staff for 5% less revenues than expected)

THEME #3: Balancing Growth & Profitability Benefits of Profit vs. Growth Focus

- •Growth requires capital, but profit creates capital
- •Profit enables higher bonuses
- •High growth is harder to manage and riskier
- •<u>Lower growth allows</u> client & project <u>selectivity</u>: more profitable and less risky
- •But growth does provide personnel opportunities & excitement
- •Does growth increase or decrease profitability?

THEME #3: Balancing Growth & Profitability: Growth & Profit Analysis

(GPA) (All firms shown)



- Unlike conventional wisdom, growth & profitability seem to be positively correlated
- Where is your data point?
- Which quadrant creates more value over time? Which destroys value?
- Happiness Quotient: internal growth rate + EBIBT/Net Revs = 6% + 11% = 17%
- What is yours?

THEME #4: Specialization vs. Diversification

Diversification: Pros & Cons

<u>Is Diversification Important?</u>

Almost everyone says yes

But what do you mean by "Diversification"?

- Service / Business Line
- Geography
- Clients
- Projects / Contracts
- Staff

THEME #4: Specialization vs. Diversification

Pros & Cons of Diversification

	EFCG
Frequent Positives:	Thoughts
 Lower volatility: spreading of risk through different markets 	Yes
•Cross-selling opportunities	Yes
 Potential to grow larger: if your market is "saturated" 	Not sure
•Can allocate existing overhead over larger revenues	Not sure

Negative:

- •Lowers relative efficiency & know-how
- •Higher overhead: overseeing more & different businesses
- •Higher risk: moving into areas you don't know ("Learning Curve")
- •Competitive disadvantage: people there probably already know the business better than you
- Lose benefits of specialization
 - •Diversification is good. But so is Specialization.
 - Which makes you more *efficient*?

THEME #5: Challenges of Internal Ownership Transition (IOT)

Internal Ownership Transition (IOT):

A major challenge for employee-owned firms. Why?

- 1. Employee <u>shareholders pull capital out</u> when they retire (and younger employees have limited excess cash to "invest")
- 2. <u>Working capital</u> needs are huge, relative to revenues, so growth requires significant capital
- 3. Much growth is coming via <u>acquisitions</u>, which requires more capital
- 4. <u>Current Generation prefers Spending to Investing</u>, and are <u>more likely to leave the firm</u> before retiring
- 5. <u>IOT Valuations</u> have <u>increased</u> (2x-3x) over past 25 years (from "Book Value" to "Multiple of Earnings")
- 6. Valuation Conundrum:

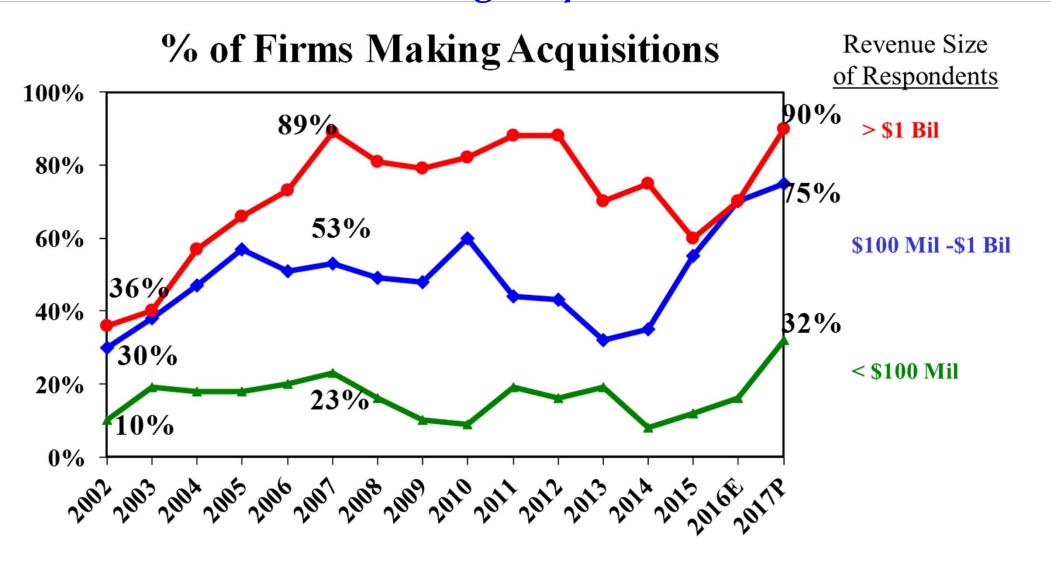
Lower IOT valuations may be "unfair", incentivize a sale, and make acquisitions difficult

Higher valuations make share repurchase more difficult

Getting the right balance

- 7. ESOP benefit: Can buy back shares in "pre-tax" dollars
- 8. Your <u>approach</u> to <u>valuation</u> needs to be <u>strategic</u>
- 9. The biggest reason firms "sell out" is because they can't fund their IOT

THEME #6: Who's Making Acquisitions?



•Integral part of growth strategy for many firms

THEME #6: M&A: "Success" of Deals

Success of A	Acquisitions	over	last Five	Years
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Rev Size of Buyer	# of firms	# of Deals	<u>Successful</u>	Marginally Successful	<u>Poor</u>
>1B	22	233	161	47	25
250 Mil - 1B	30	123	80	30	13
100 Mil- 250 Mil	46	108	72	26	10
50 Mil - 100 Mil	48	42	31	8	3
25 Mil - 50 Mil	29	15	7	6	2
< 25 Mil	49	7	5		0
Sum	224	528	356	119	53
%			67%	23%	10%
				90%	

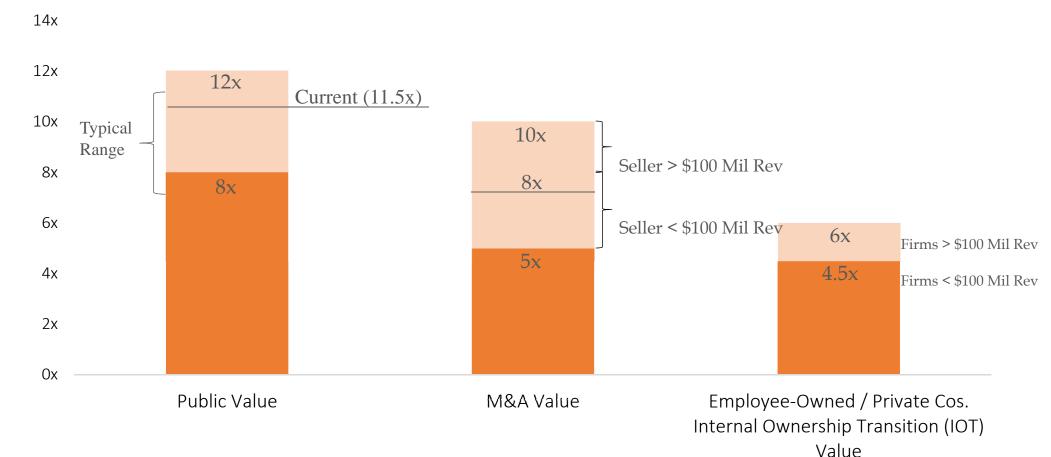
^{•~90%} of transactions Successful or Marginally Successful over last 5 years

[•]If CEOs perceive so much M&A success, M&A likely to continue

THEME #6: E/C Firm Valuation "Arbitrage"

What is driving M&A?

Conservative Internal Values of Private Firms
Make Them Accretive Acquisition "Targets" for Public Companies
(Multiples of EV/<u>"Normalized"</u> EBITDA)



Current public market is very high as are M&A values

THEME #7: Alternative Delivery & Risk Management

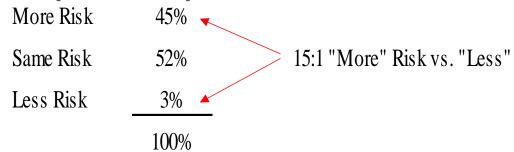
E/C Industry expects to take on more risk in coming years from "Fixed Price", "D/B" (Alternative Delivery) and "At-Risk" pricing

CFO 2013 Conference: Fixed Price

	5 Years Ago	<u>Today</u>	In 5 Years
Median % of Revenues	30%	35%	40%
CEO 2014 Conference: Design-	Build		
		<u>Today</u>	In 5 Years
% of Firms Doing D/B		53%	60%
Median % of Revenues		7%	15%

CFO 2015 Conference: At-Risk

Over the next few years, will your work have:



CFO 2016 Conference: At-Risk: 57% of firms say they are taking on greater risk 30% say they are getting "compensated" for it!

THEME #7: Alternative Delivery & Risk Management

The BIG Write-Off

(Generally applies to "fixed price liability" contracts)

- 1. How to assess Risk / Reward ratio?
- 2. What is your downside exposure?
- 3. Can you afford it?

Example: 90% chance of project completion within budget; and expected profit @ 2x normal

"Biggest Killer of Great Firms"

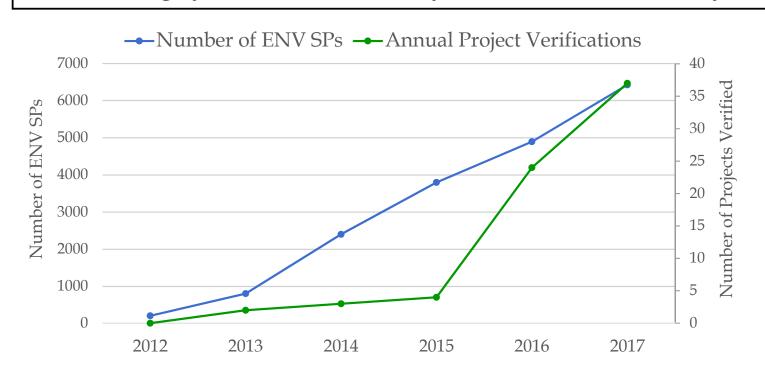
We're not saying don't do it, but you need to know how to manage it.

That experience does not come easily

Sustainable Infrastructure & Envision Rating System

Envision is the name of the Infrastructure Sustainability Rating System developed by the Zofnass Program for Sustainable Infrastructure at Harvard "ZPH" (founded 2008), in conjunction with the Institute for Sustainable Infrastructure ("ISI"), a joint venture between ACEC, ASCE & APWA. (Howard LaFever helped create this partnership).

"ENV SP" (Envision Sustainability Professional) is the credential given to engineers who complete formal training by ISI. There are currently 6400 ENV SPs (4900 last year).



SIAB* Members:

- •Bentley Systems
- •CDM Smith
- •CH2M
- •Ecology & Env.
- •Golder
- •HNTB
- •LA Metro
- •Louis Berger
- •NV5
- Power
- Stantec
- •The Nature Conservancy
- •TRC

- "SIAB" is the Sustainable Infrastructure Advisory Board of Zofnass Program at Harvard
- Envision is used in 38 states and 43 cities in the US; used in rebuild of LaGuardia Airport (NYC) and Istanbul's new airport
- Total Envision verified projects expected to be \$14 Bil by YE 2018

THE PUZZLE OF SUSTAINABLE INFRASTRUCTURE

Making the Business Case and **Opportunities for Sustainable** Infrastructure. 3. The Economic, ZOFNASS PROGRAM for SUSTAINABLE INFRASTRUCTURE 1. The relationship 2. The ability Financial and at HARVARD UNIVERSITY between to measure **Business Case** "resiliency" and sustainability. for Sustainable "sustainability". Infrastructure. 7. The role and 4. Is Sustainable 5. The 6. The role of 8. The role Infrastructure role of the the Insurance development of Pension Infrastructure Banks. of "Green more costly? Industry. Funds. Bonds". 9. The role 10. Technical 11. Investment Firms 12. The Growth 13. The Role of of Charitable Support for the Big Cities. and Potential in Demand Foundations. Benefits of "P-3" Sustainability. by Major Projects. Corporations.

EFCG Services to E/C Industry

Founded in 1990, EFCG's mission is to help Engineering and Consulting ("E/C") firms become more business and financially efficient, so that they can improve global infrastructure and sustainability, while creating greater value and opportunities for their shareholders and employees.

Financial & Strategic Consulting

Advised majority of ENR Top 500 and 150 Global Design Firms, and serve on a retainer basis to roughly 50 a/e/c firms of all sizes.

Peer Benchmarking Analysis

Perform ~100 *PBAs annually - compares a firm to 20-40 peers across 150+ key financial metrics.*

Mergers & Acquisitions

Advised on over 150 completed transactions, representing cumulative valuation of roughly \$9 billion, with client size from \$3 million to \$10 billion in revenue. We advise both sellers and buyers.

Valuations

~25 firms use EFCG to provide their annual internal stock valuations, and we perform ~50 additional ad hoc valuations each year.

Internal Ownership Transition

Specialize in assisting employee-owned a/e/c firms to meet their internal ownership transition needs, through creation or restructuring of their ownership model, increased profitability, better management of their growth, more efficient balance sheet management, and a more strategic approach to their internal valuation.

<u>5 Annual Executive Conferences</u>

Address the key financial and strategic concerns of the a/e/c industry, and corresponding executives in attendance: CEO (29^{th} annual), CFO (19^{th}), CHRO (9^{th}), CIO (4^{th}), and Rising Leaders (4^{th}).



Appendix



THEME #1: Profitability

How to Measure

Single-Line Metrics: ("Profit")

- EBIBT (pre-bonus)
- EBIT/EBITA/EBITDA
- EBT
- After-Tax Income ("PAT")

Which is most important?
(They each tell you something different)

Ratio Metrics: ("Profitability")

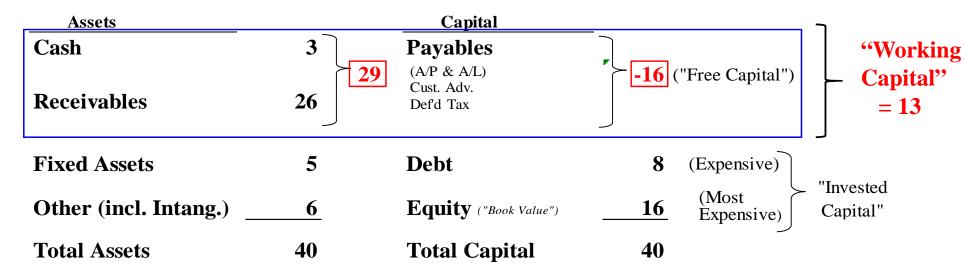
- Profit / Rev ("ROR")
- [Gross Revs vs. Net Revs?]
- Profit / Assets ("ROA")
- [How to define "Assets"?]
- (G/W? Intan's? Real Estate?)
- Profit / Capital ("ROC")
- [How to define "Capital"?]
 - (Book value? Intan's w/ or w/out? FMV? IOT Value?)
- Profit / Working Capital ("ROWC")
 - Most meaningful for e/c firms
- Remember: 2 ways to improve a ratio: Increase the numerator; or decrease the denominator
- Use right measurement for the right purpose at the right time

Managing Your Balance Sheet

"Common Size" Balance Sheet (Gross Revs = 100)

Strategic Perspective

(Typical for Employee-Owned Firms)



Balance Sheet Management:

- •Squeeze Assets: particularly Cash & Receivables
- •Maximize "Free Capital"
- •Manage appropriate percentage of Debt/Equity (see EFCG Leverage Analysis)

Questions:

- 1) Is working capital "good" or "bad"? What is the optimal level of working capital?
- 2) When do you pay for an hour of work vs. when do you get paid?
- 3) Are you better with <u>more</u> equity or <u>less</u> equity?
- 4) Is cash good or bad?
 - Observation: 2 ways to increase value per share: 1) increase numerator; 2) decrease denominator

Minimize your investment in

Working Capital (WC)

Managing Your Overhead

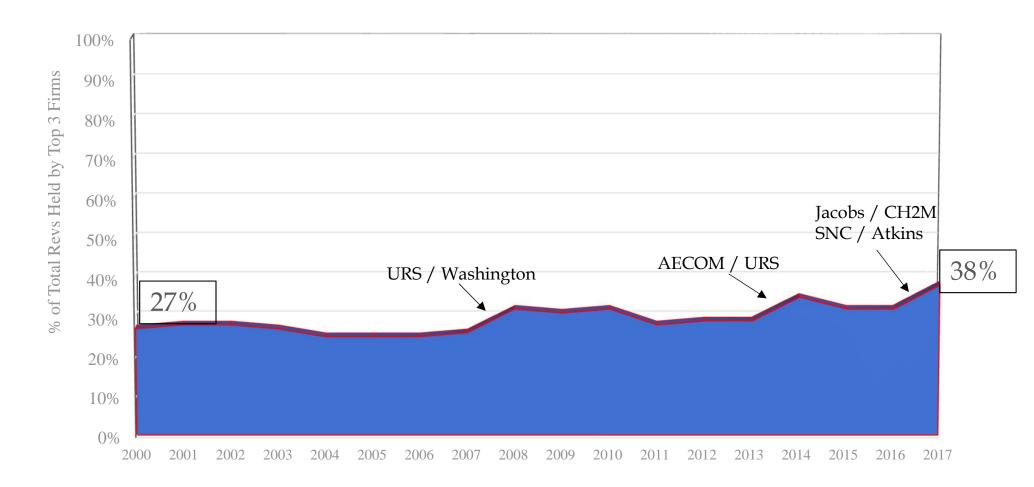
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EFCG's Overhead Analysis Model "Mapping the Overhead Genome"

111	uppm8	CIL	COVCI						
				% (of Net I	Revs			
Net Revenues					100				
Direct Labor Costs (excl. fringe & bonus expense)					36				
Gross Profit						_	64		
I. "6+ Buckets" (Indirect** and Non-Labor)	Indirect Labor	+	Non-Labor	=	Total			•	How does your firm compare to
1- Risk Management	0.4	+	1.7	= '	2.1	_			•
2- MIS/Communication/IT	1.1	+	2.5	=	3.6				peers?
As a subset, Annual Software Maintenance Fees	į	į	0.6	į					P
3- Finance/Treasury/Accounting	1.5	+	0.6	=	2.1				
4- Human Resources	0.7	+	0.8	=	1.5				
As a subset, Training / Leadership Development	0.1		0.3						
5- Business Development/Marketing	2.2	+	1.3	=	3.5				
As a subset, Bid & Proposal	0.6	!	0.1	!				•	Are there areas for improvement?
6- Occupancy	0.1	+	5.4	! =	5.5				The more areas for improvement.
6+ Office of CEO / Chair / Board	1.0	+	0.4	=	1.4				
6+ Other (incl. H&S)	1.2	+	0.1	i =	1.3				
Subtotal: "6+ Buckets"	8.2	+	12.8	=		21.0			
II. Non-Billable Time of Billable Personnel	ĺ.	Ì		ļ				•	Recommend: EFCG Overhead
1- PTO (Paid Time Off)	4.8	į	į	į	4.8			•	Recommend. EFCG Overnead
2- Business Development/Marketing	3.5	į	į	į	3.5				Door Analysis ("ODA")
3- HR / Professional Development	0.5	i İ	i İ	i İ	0.5				Peer Analysis ("OPA")
4- "Admin Time" & Other	5.0	:	 		5.0				
Subtotal: Non-Billable Time	13.8	i	<u>.</u> 	i		13.8			
III. Fringe Benefits	i	i	i i 	<u>:</u> 					
1- Payroll Tax	i	i	4.5	i	4.5				
2- Medical Costs		į	4.4	į	4.4			•	Reducing Overhead is not as
3- Retirement Costs	!	!	2.1	!	2.1				
4- Other Fringe	!	! !	1.2	<u> </u>	1.2				important as maximizing
Subtotal: Fringe Benefits	!	 	12.1] !		12.1			
IV. Other Non-Labor Cost (non-reimbursable)	!	! !		! !					Return On Overhead ("ROOH")
1- Travel / Entertainment / Auto	!	!	2.0	!	2.0				
2- Supplies / Office Equipment	!	ļ :	1.1	! :	1.1				
3- Deprec. & Amort.	ļ	ļ	1.9	ļ	1.9				
4-Bad Debt	į	į	0.2	į	0.2			•	Distinguish between " productive "
5- Relocation Costs (should not be included in HR Bucket)	į	į	0.1	į	0.1				
6- Civic Activities, Charities, Political Contributions	i	i I	0.1	i I	0.1				vs. "non-productive" O/H
7- Other Non-Labor	i	<u>:</u>	1.6	i	1.6				
Subtotal: Other Non-Labor	İ	i	7.0	į		7.0			
Total Overhead = I-IV	22.1	+	31.9	=			54		
	`	•	•	•		_			
EBIBT = Gross Profit - Total Overhead						_	10		

Industry Consolidation since 2000:

Top 3 Market Share*



- Some consolidation since 2000 (~11-percentage points among Top 3), but still a fairly "fragmented" industry
- Mega firms: lots of acquisitive growth, but not much internal growth since 2009
- How to define A/E/C industry? Data is very "noisy"!!