HORIZON KINETICS

Under the Hood: What's in *Your* Index?
(An Ongoing Series)

The AMAGF IT/Social Media Stocks – Some Factual Observations

Concentration

- The largest five companies in the S&P 500 are Apple, Microsoft, Amazon, Google and Facebook (AMAGF, in order of market capitalizations), all information technology companies.
- They are just 1% of the names, but they account for 22.59% of market value of the index. A greater concentration in one sector has probably never existed.
- Their aggregate market capitalization of $6.84 trillion[1] equals the market value of the bottom 367 companies in the S&P 500[2]. If merely five more information technology names were added – Intel, Netflix, NVidia, Adobe and Salesforce.com – the resulting AMAGF+ weight of 24.45% equates to the aggregate market value of the bottom 393 companies.
- The S&P 500 has returned 91% in the past five years[3]; the AMAGF shares have returned an average of 320%. In dollar terms, they have added $5.5 trillion of market value to the S&P 500 over the past five years, which can be compared to the total index market value increase of $12.8 trillion. [4]

	5-Yr Return	Mkt Cap. Addition, Last 5 Years	S&P 500 Mkt Cap Increase, Last 5 Years
Amazon	514%	$1,359	
Apple	348%	1,325	
Facebook	191%	518	
Google	130%	617	
Microsoft	415%	1,227	
Average:	320%	$5,046	$12,824

Market cap additions in billions. As of Sept. 29th

Growth, Scale & Sustainability

- Average annualized revenue growth for the 5 years through 2019 was 15.5%, and this is expected to increase to 16.5% in 2020 and 16.4% in 2021, based on Wall Street's consensus.
- For the 5 years through 2025, the 39 brokerage and investment firms that publish revenue and earnings estimates for the AMAGF companies collectively expect annual sales growth of 18%. This means that total revenues, which are expected to be $1.04 trillion in 2020, would rise to $2.37 trillion in 2025. That would be an increase of $1.33 trillion.

  How large are such increases?

[1] As of 9/30/2020
[2] As of this writing, the S&P 500 included 505 companies. https://www.slickcharts.com/sp500
[3] September 30, 2015 – September 30, 2020
[4] The index total return also incorporates the impact of dividends and buybacks, but it is fair to say that these five companies have contributed close to half of the gain in the S&P 500 over the past five years.

– A 16.4% increase in revenues next year (based on consensus forecasts), on a base of $1.04 trillion, would be an additional $171 billion of sales. That equals the entire revenue base of each of Johnson & Johnson, Visa and Procter & Gamble, the 6th, 9th, and 11th largest companies in the S&P 500.

– Over five years, the $1.33 trillion increase in sales by the five companies would exceed the entire revenues of these 17 non-technology companies in the top tier of the S&P 500, presently ranked from #6 through #39:

($ bill.)	S&P 500 Rank	2020 Est. Revenue
Johnson & Johnson	#6	$ 80.6
Visa	#9	21.8
Procter & Gamble	#11	72.8
UnitedHealth Group	#12	255.6
Home Depot	#14	124.9
MasterCard	#15	15.7
Verizon	#16	127.2
Pfizer	#17	49.5
Merck	#19	48.0
Exxon Mobil	#21	182.8
PepsiCo	#22	68.0
Walt Disney	#24	65.1
Coca-Cola Company	#29	32.8
Abbot Labs	#31	30.1
Bristol-Myers Squibb	#35	42.0
Amgen	#36	25.4
McDonald's	#39	19.1
		$1,261.2

At the consensus estimate of 18% revenue growth, how large would the five AMAGF companies be in the 5-year projection period?

– If their prices rise on a 1:1 basis with revenues (roughly a constant P/E ratio), then their aggregate market capitalization in five years will expand from the current $6.84 trillion to $15.64 trillion.

– Since the market value of the S&P 500 is about $30 trillion, then in 2025 these five companies would account for 52% of the overall index as it exists today.

– The top 10 technology companies (the AMAGF+, for convenience), which would include Intel, Netflix, NVidia, Adobe and Salesforce.com, have an aggregate stock market cap of $8.06 trillion, since the five additional companies add a collective $1.22 trillion. Analysts expect their sales growth to be even higher, at over 20%.

– Using the same 18% growth rate as for the AMAGF, the AMAGF+ would reach a collective market cap in five years of $21.2 trillion: 70% of the S&P 500's current market value.

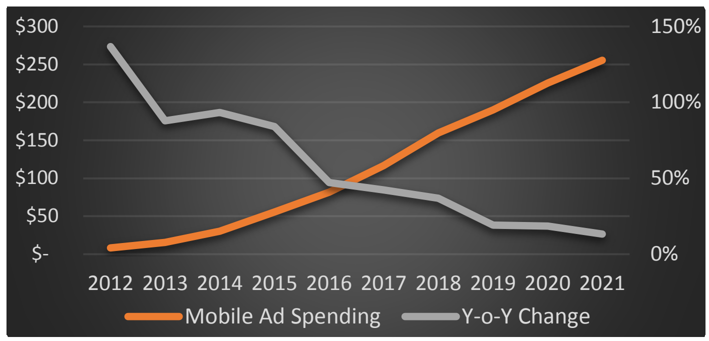
– Of course, the other 99% or 98% of the S&P 500 companies are expected to grow as well. To equalize the projection, if the balance of the S&P 500 appreciate by 4% annually, roughly in line with analysts' expectations for nominal GDP, then the AMAGF companies would account for 39% of the index in 2025, and the AMAGF+ share would be 44%.

($ bill.)	2015 Rev.	2020 Rev.	Growth
Intel	$55.4	$75.1	36%
Nvidia	$5.0	$15.8	215%
Salesforce.com	$6.7	$20.8	212%
Netflix	$6.8	$24.9	267%
Adobe	$4.8	$12.8	167%
	$78.6	$149.4	90.0%

Market Saturation Considerations

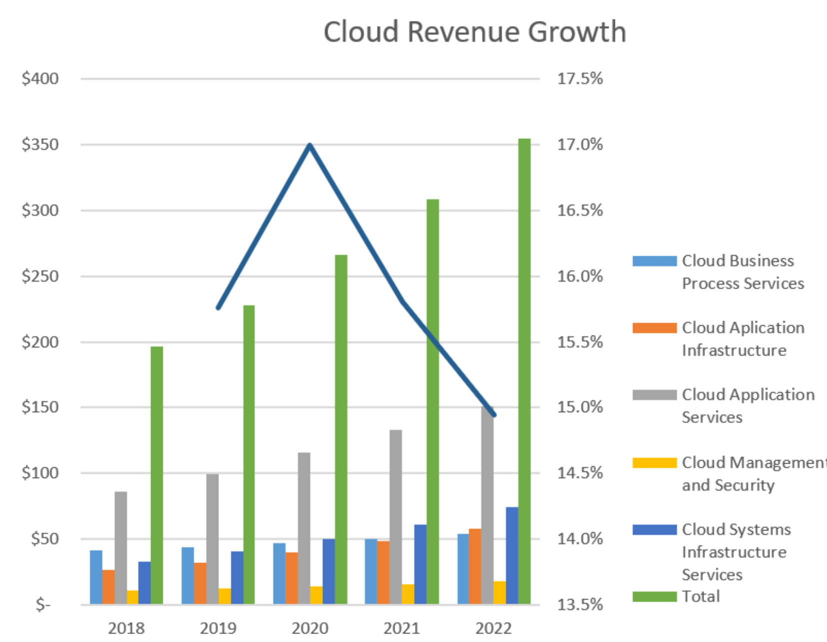
In Advertising: Google and Facebook

- In 2018, mobile ad spending worldwide was roughly $159.9 billion and is expected to grow to $255.4 billion by 2021[5]. Google and Facebook had combined revenue of $232 billion in 2019, which is expected to expand to $299 billion in 2021. Not all of their revenue is derived from advertising, but the vast majority is. Together, they will account for almost the entire market within two years.
- The mobile advertising segment grew by 33% per year between 2016 and 2019.
- The global advertising market, which includes all forms of advertising (magazines, billboards and cereal boxes, radio and television, etc.), not just mobile, is estimated to have reached $560 billion in 2019[6]. That was a 4% annualized increase from 2016. Global advertising typically expands by about 3% to 4% per year, with some cyclicality.
- Year-over-year mobile ad spending, which essentially comprise Google's and Facebook's revenues, has moderated to single-digit expected growth in 2022.



In Cloud Computing

- The cloud market was $272 billion in 2018 and is expected to reach $623 billion by 2023[6], annual growth of 18%.
- Most of the growth was from the 'public cloud' segment, which was $6 billion in 2008 and $141 billion in 2018, which is a 37% rate.
- Public cloud spending is projected to slow to 17% in 2020, and to 15%, in 2022[7].
- Amazon Web Services (AWS) accounted for 63% of Amazon's total operating income in 2019, and 65% of



($ bill. Source: Gartner, November 2019.)

[5] Statista.com
[6] Source: MarketsandMarkets
[7] Gartner, Inc.

operating income in the first half of 2020.

- Major competitors include Microsoft, Amazon, Google, IBM and, to a lesser extent, Oracle and Dell. Azure, is now a major portion of Microsoft's revenues and earnings.
- The AMAGF digital platforms are 'asset-light', high-margin services businesses.
- Cloud services like AWS, though, are asset-intensive 'bricks-and-mortar' operations. Unlike the AMAGF digital business models, cloud computing is not highly differentiated.

Implication, broad: The long history of slowing-growth scenarios for such types of businesses is that price becomes the differentiating factor. A less-dominant company in cloud computing, such as IBM, which must maintain its presence in large-scale computing, might have to try to claim market share at the cost of profitability. Price competition would then impact the more dominant companies like Microsoft, Google and Amazon.

Implication, narrow: Amazon's operating income in the second quarter of 2020 was $5.8 billion. If the AWS-division operating margin is reduced to 20% from 30% – still generous by most business model measures – it would contribute $1.2 billion less in operating income. That would be a 20.5% reduction in AMZN total operating income.

Regulatory Risk – Net Neutrality

- Net neutrality regulation prohibits internet service providers from charging differential fees based on usage: the same rates are paid by all of the millions of retail and commercial businesses in the world, and all have the same access. Its regulatory and legal status is now in flux between the FCC, various states and courts.
- 43% of all internet traffic is accounted for by six companies: Google, Netflix, Facebook, Microsoft, Apple and Amazon.[8]
- The broadband internet *access* for those six companies, as well as the millions of other users, is provided by so-called landline local phone and cable companies. These include well-known firms (e.g., Verizon, AT&T, Comcast and T-Mobile) and lesser-known yet significant local phone companies such as CenturyLink and Frontier Communications.
    - CenturyLink, for example, has 450,000 route-mile network of fiber optic internet access. It owns the hardware, operating system and cloud infrastructure that accompanies that network, including 340 co-location facilities and data centers. All of this plant and equipment must be maintained.

[8] https://www.sandvine.com/hubfs/Sandvine_Redesign_2019/Downloads/Internet%20Phenomena/Internet%20Phenomena%20Report%20Q32019%2020190910.pdf

- To accommodate the constantly rising bandwidth consumption of the internet 'super-users', local phone companies must make comparable investments in their networks.[9] Yet, they are losing landline customers who 'cut the cord' and rely exclusively on cellular service. Both CenturyLink and Frontier had lower revenues in the most recent quarter, which is a regular phenomenon.

- In the past year, these six telecom companies spent $65 billion building, upgrading and maintaining those networks, which is about 8.0% of their combined stock market value.

	Capital Expenditures, as % of		
	Mkt Cap	Revenue	Oper. Inc.*
Verizon	9.10%	17.21%	77.37%
AT&T	9.00%	10.44%	64.91%
Comcast	5.63%	11.54%	60.55%
T-Mobile	5.38%	14.78%	139.40%
Century Link	32.07%	17.48%	105.43%
Frontier	6805.88%	15.08%	105.66%
Total	**8.0%**		
Total Cap Ex	**$65 billion**		

* Before deduction of goodwill impairment charges.

- The six super-user AMAGF+Netflix companies that consume all of the aforementioned bandwidth provided by the network operators had total capital expenditures of $87 billion, which is about 1.2% of their combined market value.

  However, only a very small part of IT company capital expenditures, of that 1.2%, is invested in network infrastructure improvements. These users have, essentially, outsourced the development and maintenance of the broadband networks to the network operators for no compensation.

	Capital Expenditures*, as % of		
	Mkt Cap	Revenue	Oper. Inc.
Amazon	1.52%	7.54%	143.81%
Apple	0.42%	3.03%	12.36%
Facebook	1.92%	19.22%	51.79%
Google	2.42%	14.57%	73.72%
Microsoft	0.97%	10.80%	29.13%
Netflix	0.18%	1.74%	1.05%
Total	**1.2%**		
Total Cap Ex	**$87 billion**		

*Cap ex *not* for internet infrastructure maintenance.

- In essence, the free-rider principle is being employed by Netflix for its video-streaming service, by Google for its YouTube channel, and by cloud computing providers like Amazon Web Services and Microsoft's Azure.

- There is an economic consequence to the free-rider aspect of this regulatory framework. T-Mobile has not had positive free cash flow since 2012, since all of its cash flow, and more, has been reinvested in its network. CenturyLink's share price is 70% lower than 5 years ago, and it has a 9.3% dividend yield. The AT&T share price is 12% lower than 5 years ago and it has a 7% dividend yield.

[9] From Frontier's last annual report:

> *…we anticipate that continued increases in internet usage by our customers will require us to make significant capital expenditures to increase network capacity or to implement network management practices to alleviate network capacity shortages. The FCC's stringent definition of broadband service and consumers' demand for faster transmission speeds could create additional requirements for higher capital spending. Any such additional expenditures could adversely impact our results of operations and financial condition.*
>
> *Video streaming services, gaming and peer-to-peer file sharing applications use significantly more bandwidth than other Internet activity such as web browsing and email…we could be required to make significant budgeted or unbudgeted capital expenditures to increase network capacity in order to avoid service disruptions, service degradation or slower transmission speeds for our customers. …Competitive or regulatory constraints may preclude us from recovering the costs of network investments designed to address these issues, which could adversely impact our operating margins, results of operations, financial condition and cash flows.*

  - Frontier Communications, one of the local telco internet service providers, declared bankruptcy in April 2020. Frontier is not a small company: it has 4 million customers and 18,300 employees across 29 states. Its shares were $85 per share 5 years ago, and are now $0.17.

- The provision of internet access as now configured via net neutrality regulation has broader operational and financial consequences. As well. In Europe, earlier this year, in order to protect the network infrastructure from breaking down due to a surge in usage, Netflix, YouTube and Amazon agreed to reduce their bitrate in order to reduce bandwidth usage by their services.

  If the primary users of internet bandwidth are ultimately required to pay for their use of the infrastructure, the impact upon their profitability would be consequential. If super users had to make infrastructure payments proportional to their usage, say 40% of the capital expenditures of the six telcos listed above, that would be $26 billion per year. $26 billion is about 30% of the $87 billion of capital expenditures of the AMAGF+Netflix.

  As a proportion of their operating income, an equally applied 30% increment in expense above their current capital expenditures – a very rough, undifferentiated and wholly inadequate form of estimate – would be equivalent to reducing their operating margins by several percentage points (for Amazon, Apple and Netflix) by 9% for Microsoft, by 16% for Facebook and by 22% for Google.

Options Expense and Dilution

- In 1994, President Clinton signed legislation that eliminated the deductibility of executive cash compensation over $1 million, but exempted incentive compensation of any kind[10]. Since then, incentive compensation has increased by magnitudes, while cash compensation has not, particularly at technology companies.

- Option-based compensation mostly bypasses the income statement, because only a small portion of the expense of an options package, a highly discounted amount calculated according to the Black Scholes option pricing formula, appears as an expense. The bulk of it comes a few years later when the employee exercises the options. That transaction is recorded directly in the shareholders' equity account.

- As compensation is an ordinary cost of doing business, the earnings are overstated, because the accounting entry understates operating expense. The portion of the AMAGF's companies' pre-tax operating income that would have been lost in 2019, if the cost of options grants were expensed on the income statement:

Company	TTM Operating Income	TTM Stock-based expense	Percentage
Amazon	$16,869	$7,977	47.3%
Apple	67,138	6,604	9.8%
Facebook	27,899	5,553	19.9%
Google	32,803	11,842	36.1%
Microsoft	52,959	5,289	10.0%

($ mill. Represents trailing twelve months.)

[10] IRS Section 162(m); for publicly traded companies.

Example: Amazon

- Amazon's share count has expanded by almost 34 million over the past 8 years. It reports the stock-based compensation expense as follows:

2019	2018	2017	2016	2015	2014	2013	2012	*Total*
\$6,864	\$5,418	\$4,215	\$2,975	\$2,119	\$1,497	\$1,134	\$833	*\$25,055*

(in millions)

- The 34 million shares were issued at a stated (when-issued) cost of \$25.1 billion. They are currently worth, via appreciation, more than \$108 billion. This is approximately 4x the amount of cumulative net income generated over the 8 years through 2019 (\$27.5 billion). The difference may be considered dilution to shareholders, beyond what is recorded in the income statement.
- If the shares do *not* appreciate, the result is not an equilibrium or stable state. If options issuance in the next several years were to be identical to the last several, with the exception that the shares do not appreciate above the prices at which the options are issued, then tens of billions of dollars of options will expire worthless.

  There will be no share dilution in that scenario, but thousands of employees might insist on being paid in cash rather than in options. Paying out an additional \$6 billion+ per year in actual cash compensation, would reduce Amazon's net income by roughly half. In that sense, the Amazon profit margin is highly dependent upon continued share price appreciation above a certain hurdle rate required to maintain employee options exercise value.

Example: Google and Facebook

- In the past five years, Google has spent \$38 billion on share repurchases; that would be, very roughly, about 5% of its average market capitalization during the period. The shares outstanding are down only 0.15%.

- Facebook has spent \$19 billion on share buybacks in the past five years; its shares outstanding have expanded by more than 50 million (all after the takeover of WhatsApp).

  Facebook had net income of \$18.5 billion in 2019. It also recorded (in shareholders' equity, not on the income statement) \$4.8 billion of share-based employee compensation, and spent \$4.2 billion on share repurchases, which represented 23% of its \$18.5 billion of income.

The off-income-statement share issuance/repurchase process for stock-based compensation is not dissimilar to the Federal Reserve monetizing the debt. This self-reinforcing process functions so long as the share prices continue to appreciate at a sufficient rate.

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