



# **What Just Happened? Or Didn't: a Personal Perspective on Three Decades of Forecasting Change in the Automotive Industry**

**Glenn Mercer – for GERPISA, June 2020**



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## Disclaimers

1. These are personal reflections only, not based on any theory or quantitative analysis.
2. I attempt to maintain a global perspective, but inevitably my focus is on the American situation.



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## Objective

- Today in the automotive industry *everyone is a forecaster*, as we all try to project the trajectory of autonomy, mobility, electrification, etc. Thus forecasting is an important topic.
- My two other GERPISA talks are focused on forecasting, so this is also a topic of high personal interest to myself.
- By learning from past predictions, we can improve the accuracy of our current forecasts. Too often we look only to the next forecast, never “auditing” those of the past.



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## Experience: overview

- 1985-2006: McKinsey & Co. The Firm's sole Partner dedicated 100% to automotive. Several hundred automotive client projects. Responsibility for acquiring and interpreting findings from inside the Firm (projects) and outside (articles, reports, papers, theses, IMVP, GERPISA, much more)
- 2006-present: independent researcher. Learning from Board seats (5 automotive suppliers), private and public equity work, research for industry associations, more



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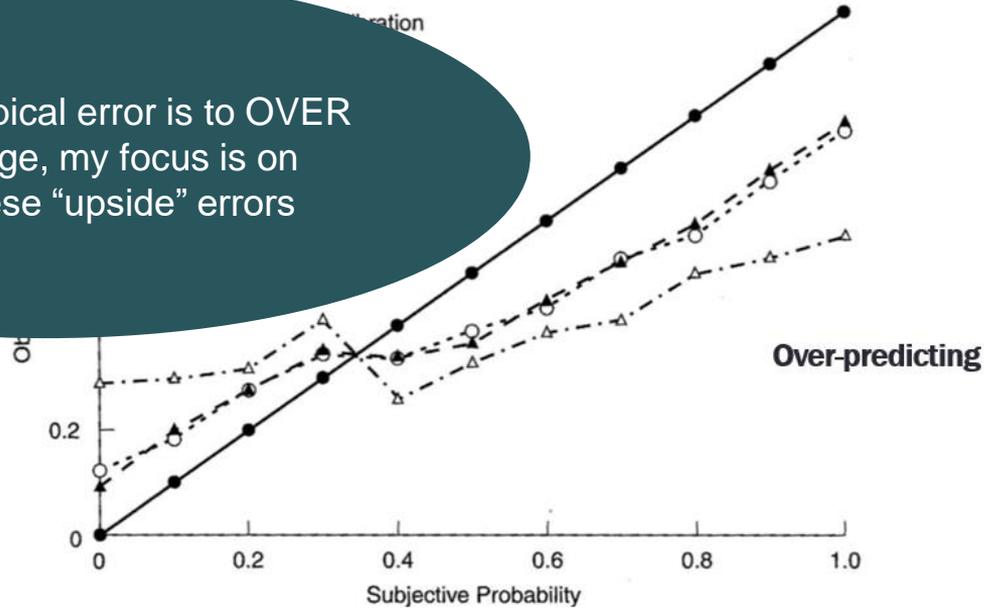
## 1. Change is *not* accelerating

Factor (USA data except airliner cruise speed)	Metric	1917	1967	2017	Change 1917-1967	Change 1967-2017
Infant mortality	Per 1,000 live births	95	21	6	-78%	-72%
Life expectancy	At birth, male, years	48	67	79	1.4x	1.2x
Households with telephones	Percent	35	85	99	2.4	1.6
Homes with indoor plumbing	Percent	2	96	99	+94%	+3%
Cars/household	Units	~0.25	1.25	1.85	5x	1.5x
Airliner cruise speed	Knots, avg.	~65	450	475/500	7x	1.1x
Real GDP/capita	1990 \$,000	5.3	14.3	31.5	2.7x	2.2x
PhDs issued	,000	~1	~20	~60	20x	3x



## 2. We *over*-predict change

Because our typical error is to OVER predict change, my focus is on reducing these “upside” errors



Source: Philip Tetlock, U California Berkeley, analysis of 82,000 expert predictions



## Why? We see *now* as special

The 2018 election is "The most important election any of us have voted in so far," declares Joe Biden.

2016: "I believe this may be the most important election of our lifetimes," Hillary Clinton said.

2012: "The most important election of our lifetime," according to Mitt Romney. "The most important election since 1860," Newt Gingrich added.

2008: "This is certainly the most important election in my lifetime" said Obama.

2004: "This is the most important election of our lifetime," John Kerry. Bruce Springsteen: ditto.

2000: The National Rifle Association: this is "the most important election since the Civil War." Rush Limbaugh went further: "This is the most important election in our history."

1996: Ralph Reed (Christian Coalition): "the most important election of our lifetime."

1992: Bill Clinton explained 1992 was "the most important election in a generation."

1988: Robert C. Byrd: this "may be the most important election of (the) century."

1984: Ronald Reagan: "Americans are facing the "most important election in this nation in 50 years."

Sources: Real Clear Politics and The American Scholar



### 3. Mean regression *works*...

The Day  
the World  
Changed



joseph margulies  
what changed  
when  
everything  
changed  
9/11 and the Making  
of National Identity



THE DAY OUR WORLD CHANGED  
children's art of 9/11

Rubin F. Goodman, Ph.D. & Andrea Henderson Fahnestock  
Introduction by Rudolph W. Giuliani  
Forewords by Harold S. Koplewitz, M.D. & Robert R. Mardonald

- There *was* massive impact: 3,000 deaths, much emotional damage, \$5 trillion spent on two wars, permanent TSA presence
- But how much did underlying *behavior* change?



...even as “everything changes”

**FRED**

— Revenue Passenger Miles for U.S. Air Carrier Domestic and International, Scheduled Passenger Flights





## 4. Equilibrium > extrapolation

Forecasting improves if we discard extrapolation in favor of finding the new equilibrium. In the USA:

- AirBnB had its best year ever in 2019... and hotels had their highest-ever occupancy rates
- Also in 2019, market share of e-books fell for the 3rd year, while print books held steady (all growth was audio books)
- “Build to order” OEM Tesla in 2019 continued sales from inventory, and paid salespersons for quota fulfilment



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## Forecasts that proved right

1. “Electrification (HEV/PHEV/BEV) of the fleet will proceed” ... though more slowly than most expected\*
2. “The Toyota Production System (aka “lean”) will become dominant in car plants around the world”
3. “China’s OEMs will grow fast” (but did not export as foretold)
4. “Per-car fuel economy will improve, and emissions will fall”
5. “Electronics and software will become ever more critical to car operation and provision of customer value”

\* But note ~2000 many forecasters were projecting *fuel-cell* cars to out-sell electric vehicles by 2010-2020



## Forecasts that proved wrong

6. “Cars will soon be made mostly of Al, or of plastic”
7. “OEMs will do most purchasing via shared online platforms”
8. “OEMs will slash vertical integration and utilize contract manufacturing, so as to become asset-light brand integrators.”
9. “The costs of developing and building cars will become so great that OEMs will consolidate in number to 5-10 globally.”
10. “The ultra-low-cost car will achieve significant market share.”
11. “Cars will be built to order, so system inventories will fall.”



## Plastic- or Al-intensive cars

6. “Cars will soon be made mostly of Al, or of plastic.” (1980s, 90s)
  - Reality: steel remains dominant. In the average USA vehicle, from 1995 to 2015, the share of Fe fell (12% to 8%), and while Al did rise (7/10%), along with plastics (8/10%) and other materials (18/20%), steel remained dominant (55/52%).
  - Why?
    - struggling steelmakers could not afford to “lose cars,” and innovated rapidly (e.g. HSS, UHSS, tailor-welded blanks)
    - optimists saw Al’s and plastic’s *product* advantages, but under-estimated their *process* (manufacturing) issues



## Shared online purchasing

7. In 2000 DCX, F, GM create a massive internet-based B2B exchange (Covisint); later Nis/Ren, PSA, VW, Toyota join. Goal: lower parts costs ( $\geq$  \$1K/car), in part via reverse auctions.\*

- Usage never reached expectations, and in 2004 Covisint, reduced to a B2B messaging firm, was sold, for just \$7 mm
- Why ?
  - Suppliers saw the exchange as a price hammer, not a cost saver
  - Having the auctions run by an OEM-owned organization eroded trust
  - Suppliers and OEMs both learned to game the system (e.g. “phantom auctions”)
  - OEMs found they were averse to sharing purchasing data with their rivals
  - Most parts were too unique to be usable across OEMs (let alone *within* OEMs)

\* In an RA suppliers bid the price at which they will sell a component, and prices *fall* until a winner emerges.



## OEMs will only integrate

8. “OEMs will give production to contract manufacturers (CMs), keeping only brand management as core, à la Apple.” (1990s)
- Reality: CM mostly declined: Valmet, VDL/Nedcar keep going; Magna-Steyr thrives; Pinin Farina, Karmann, Heuliez, Bertone, Kanto and Central all failed, left CM, or were absorbed by OEMs
  - Why?
    - OEM production flexibility improved dramatically, reducing need to outsource
    - Some pressure on OEMs to maintain employment levels (from governments, unions)
    - Persistent issues of vertical market failure, especially given “lumpy” demand



## OEMs will consolidate

9. “OEMs will consolidate to just a few globally.” (1980 onward)
- Reality: the concentration of OEMs has *fallen*: production share of the top 10 OEM groups: 1990, 82%; 2000, 73%; 2010, 71%; 2019: 71%.\* Some shrank (via reversal of globalization, sale/closure of brands, etc.), and Chinese OEMs (all outside the top 10) have both proliferated and grown.
  - Why?
    - economies of scale are not unlimited, nor their capture assured
    - we missed the rise of the Chinese OEMs
    - political forces for independence (families, governments) remain very powerful

\* 74% if FCA and PSA merge; 68% if they do not, but Nissan and Renault count as two



## Ultra-low-cost cars will rise

10. Bosch (price  $\leq$  €7K): 15% of world market by 2015; Roland Berger ( $\leq$  \$10K) 18 mm by 2012; Ricardo ( $\leq$  €5K) 7 mm by 2010 (~2000)
- Reality: none of these forecasts came true (although sub-\$5,000 low-speed EVs are common in China). In the USA (e.g.) there are *no* cars for sale with MSRP at \$12,000 or less.
  - Why?
    - Profits are almost impossible to achieve at these price levels
    - Regulatory costs dictate a price floor, such that only regulatory relief can lower it (e.g. China LSEV, France *voiture sans permis*, USA Neighborhood Electric Vehicle)
    - Consumer demand seems to exist in theory but not in practice: “A used Honda does not reveal my family’s status: a Tata Nano tells the world I am poor.”



## Build-to-order will rule

11. “...the current ‘stock-push’ supply system which fulfills most orders from existing stock is no longer a viable proposition. [ economic pressures ] have forced OEMs to rethink strategy in favour of stock-less ‘build-to-order’ systems.” (Dr. H, 2003)

- Reality (USA only!): vehicle inventories in 1958: 55 days of sales; half a century later: 70 days... we have gone *backwards!*
- Why?
  - Asymmetric economics: cost of stock-out is seen as greater than carrying cost
  - Stocks are inevitable when not every model can be guaranteed to succeed.
  - Incredible inertia of the entrenched system (see the 3 Day Car programme)
  - “Amazon has trained us too well: if I need only wait 1 day for a \$5 pen, why would I wait two weeks for a \$50,000 car? Instant gratification rules.”



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## Conclusion

### Hypotheses on sources of error (beyond my cited biases):

- Underestimating incumbent progress (1 ICE; 6 steel; 8 OEM manufacturing)
  - Failure to take a broad view (3 China market surge; 6 process issues)
  - Overlooking empirical commercial dynamics (7 participants' disincentives)
  - Extrapolation without cause (9 EofS not infinite)
  - Ignoring (ir)rational consumer requirements (10 status signaling, 11 impatience)
  - More?
- ▶ Looking for these errors in my own forecasts has helped to improve them.

**Any questions or comments?**

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