



July 2018

Through Thick and Thin, and Changing Data

The Innate Influence of Prior Predictions on Corporate Disclosures

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Contents

- Background 3
- Introduction..... 3
 - Understanding Commitment and Consistency 3
- Public Statements 4
- Examples of Commitment and Consistency Getting the Better of Accuracy 8
 - Goldman Sachs vs. Merrill Lynch 8
 - Volkswagen (“VW”) Emissions 11
 - JPMorgan and the London Whale 13
 - Continued Reliance on Flawed Credit Rating Models 14
 - Valuation Issues (Delay-and-Pray) 15
- Solutions..... 17
- Conclusion..... 20
- References 22
- Endnotes 23

Background

In late 2006 and early 2007, when it saw a mortgage-related crisis looming, Goldman Sachs off-loaded many of its (long) mortgage-related exposures, and in quick succession bet against (shorted) other mortgage-backed products. Many of Goldman's competitors noticed the same sorts of underlying deterioration at or around the same time as Goldman, but failed to respond accordingly. Bear Stearns was "rescued" in a Fed-assisted merger with JP Morgan; Lehman Brothers went under; and Merrill Lynch likely would have followed suit if not for a crisis-era merger with Bank of America.

But what was it about Goldman that enabled them to act decisively in shifting their asset exposures and altering their business operations? And why were its rivals so much slower to respond? There are several possible answers to this question. One possible explanation, the focal point of our piece, looks at the powerful pressures individuals feel to appear consistent with certain of their prior commitments. As we shall see, Goldman Sachs had a strong and profitable mortgage-related operation; but Goldman was not *committed* to that business, at least not to the same degree as Merrill Lynch.

Introduction

Many shareholder lawsuits center on the supposed failure of the company to punctually update its shareholders (or prospective investors) of any material changes.

Investors buying shares after the problematic event, but before it has been disclosed, might rightly feel aggrieved at having invested based on management's projections, despite management having known *at the time of the investment* that some of their operations were not going according to plan. Investors argue, then, that they paid inflated prices for their shares during the period leading up to the corrective disclosure.

Why might a company fail to update its shareholders on a timely basis? Each instance can be investigated separately, but a case-by-case approach sometimes misses the bigger picture: that there are common threads among the companies or the individuals within them that can lead them to delay disclosure.

We examine just one of these common threads here — that individuals (here, company executives) feel unduly influenced to maintain their prior estimates, sometimes despite knowing them to be faulty, because of a societal pressure to appear consistent. This need to appear consistent seems to, at least anecdotally, explain several recent and surprising failures in corporate decision-making, and we detail many of those here. We also describe the circumstances in which companies may be most likely to stick with faulty estimates: when a statement is made publicly and the company or its executives are heavily vested in the outcome.

Understanding Commitment and Consistency

Psychologists have long studied the various factors that can influence the way people act, often in the contexts of sales or negotiations.

Consistency is just one of these influential factors. The need to be consistent is ingrained in human nature from an early age as a valuable trait: individuals found to be inconsistent are denigrated as being indecisive, two-faced, confused or even mentally ill. People therefore hold a strong desire to appear consistent: their impulse, when challenged, is therefore to continue to default to their current stance. This

impulse is just that — an impulse. It is a mental shortcut that individuals do not consciously think about or control.

The need to appear consistent is not as obvious when it pertains to minor things, like what one wants to eat for lunch; but it is more potent a force in the context of issues to which the individual is *committed*.

What leads parties to be *committed* to a thought or an idea?

First, companies or individuals will be more likely to be committed to something if their self-image is built around it — they identify deeply with it. This is particularly noticeable in the realm of political beliefs,^a with studies showing that individuals subconsciously choose their opinions and positions based on the stances they are expected to hold, given their stated affiliations. The deep sense of ownership and commitment to a system can also be seen in the avid support and sometimes fanatical behavior of sports fans, who see their local teams as a somewhat natural extension of themselves, representing their interests.

“All things being equal, you root for your own sex, your own culture, your own locality ... and what you want to prove is that *you* are better than the other person. Whomever you root for represents *you*; and when he wins, *you* win.”

– Isaac Asimov

Next, the more serious the commitment, the more likely it is for people to impulsively want to stick with their current position. If you wanted a third party to live up to a commitment, you would have that person write it down (to formalize it internally) or publicize it (to create external pressure or oversight). In fact, it has been shown that when people are asked to verbalize or write down a statement, *even if they do not believe it*, the mere act of expressing the statement can formalize it in their minds, thereby increasing their commitment to its validity.¹

Corporations (often through their executives) make numerous public statements that, once made, create a subliminal pressure in the direction of subsequent adherence. That is typically a positive idea: one should encourage companies to say what they mean and mean what they say. But complications arise in that many of the public statements are forward-looking statements: projections or estimates of future events or conditions. Yet despite these being mere “predictions,” by their very nature understood to be imprecise, the consistency impulse often still kicks in, driving individuals to maintain these predictions, *even when the situation changes*.

This research piece examines the tension that can build around public statements, and the thorny situations several companies find themselves in when maintaining estimates or desperately trying to achieve prior guidance, even after the economic environment has changed materially. We suggest fixes for executives to implement to reduce the potential for subliminal behavioral tendencies, such as the need to appear consistent, to interfere with the goal of delivering honest and accurate communications to shareholders and other stakeholders.

Public Statements

Companies make public statements on a frequent basis, including as part of capital raises and in the process of regularly updating the public as to the company’s recent performance, its current financial condition and, sometimes, its prospects.

^a For example, individuals often tend to choose their policy preferences based on their partisan identities, rather than the converse.

The Securities and Exchange Commission (SEC), as part of its mission to “protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation,”² mandates that publicly-traded companies periodically report the status of their financial condition and operations, and that they provide additional public disclosures on an interim basis, as needed.^b

Many of the public statements about the company’s then-current financial position are thus required, but other statements are optional, such as guidance as to the company’s future performance.^c The annual financial statements are audited and generally “factual” in nature, such as the company’s then-current cash position, expenses or revenues. On the other hand, the guidance is often provided in the management discussion and analysis (MD&A), quarterly filings (10-Q reports) or news releases (concurrently as 8-K reports), which go unaudited, and are presented in the form of forward-looking and predictive opinions.

We use the term *estimates* to broadly describe all numerical inputs into the public statements made by companies, where they are audited inputs or unaudited projections that might influence a company’s guidance.^d

For our discussion, *estimates* include basic economic projections that might be relevant to the company’s business prospects, or more particular estimates of future income, revenues, product sales, or the viability of certain projects. When valuing its own assets (such as a mine, plant, building, or a book of receivables) a company typically relies on estimates, whether they be internally or externally driven.

With companies trying to placate shareholders or appeal to prospective investors when raising funds (or raising funds *cheaply*), there is often a tendency for executives to be aggressive in their estimates, an issue well understood by sophisticated market participants.^e Certainly, an investor is less likely to be bullish on a project or operation if management is not enthusiastic about it, which often leads management to communicate its optimism by way of producing ambitious estimates. This “game,” in which executives need to be honest, but are simultaneously driven to be bullish about their chances of success to win the investor buy-in, often culminates in the production of exaggerated estimates from the

^b The stock exchanges, as part of their listing requirements, also require listed companies to make certain periodic disclosures.

^c Corporate executives typically provide the required disclosures within written reports, but they also regularly conduct public conference calls with investors and analysts, during which participants may ask the executives to comment publicly about particular matters.

^d Investors generally value companies based on their projected future cash flows or earnings: thus, higher earnings projections result in higher company valuations. Management is often tempted to make forward-looking statements that positively influence (or skew) investors’ impression of the company and its prospects, encouraging investors to lift their expectations, culminating in higher share prices. Higher share prices bring tangible and intangible benefits to management and the company itself, including: (1) management’s variable compensation may be tied to share performance; (2) a significant portion of management’s compensation can come in the form of shares or equity options, which increase in value as the company’s share price rises; (3) higher share prices may allow the company greater “currency” for pursuing stock-based mergers and acquisitions; (4) higher share prices may enable companies to less costly debt financing or equity capital; and (5) higher share prices tend to give management greater job security, as board-members perceive that management has created shareholder value.

^e It can be very difficult for an investor to discern whether optimistic projection are the result of optimistic managers, deluded managers, or purposeful false statements (fraud). In Silicon Valley, for example, managers sometimes promise the “impossible” and then go on to deliver it.

very beginning — and the creation of inflated expectations by investors, which are difficult for management to subsequently lower.

Examples of *Estimates*

Companies often provide near-term and long-term estimates to stakeholders and prospects, including in the form of projections (“guidance”) on revenues, earnings, and the likelihood of certain ventures proving fruitful.

Apple (Feb. 2018): “Apple is providing the following guidance for its fiscal 2018 second quarter: revenue between \$60 billion and \$62 billion....”

BHP (Mar. 2018): “Total iron ore production for the nine months ended March 2018 increased by two per cent to a record 175 Mt, or 203 Mt on a 100 per cent basis. Guidance for the 2018 financial year has been reduced to between 236 and 238 Mt ... reflecting car dumper reliability issues as we push to record levels of production.”

DowDuPont (May 2018): “Our portfolio benefits from these macro trends, and we see our innovations and growth investments driving above-market growth. We see this strength continuing into the second quarter. We expect second quarter net sales to be up more than 10 percent and operating EBITDA up more than 20 percent year-over-year.”

Pfizer (Jan. 2018): “Pfizer’s 2018 financial guidance ... reflects a full year contribution from Consumer Healthcare. Pfizer continues to expect that any decision regarding strategic alternatives for Consumer Healthcare will be made during 2018. Financial guidance also assumes no generic competition for Lyrica in the U.S. until June 2019, which is contingent upon a six-month patent-term extension granted by the U.S. Food and Drug Administration (FDA) for pediatric exclusivity, which the company is currently pursuing.”

Sources:

<https://www.apple.com/newsroom/2018/02/apple-reports-first-quarter-results/>

https://www.bhp.com/-/media/documents/media/reports-and-presentations/2018/180419_operationalreviewfortheninemonthsended31march2018.pdfclass=?la=en

<http://www.dow-duPont.com/news-and-media/press-release-details/2018/DowDuPont-Reports-First-Quarter-2018-Results/default.aspx>

<https://investors.pfizer.com/investor-news/press-release-details/2018/PFIZER-REPORTS-FOURTH-QUARTER-AND-FULL-YEAR-2017-RESULTS/default.aspx>

Problematically, while the marketplace rewards management’s confidence as to its prospects, it also regularly rewards consistency as to its meeting its targets, by assigning higher values to companies whose returns are more “predictable” (i.e., earnings are more regularly consistent with prior estimates). Studies have found that corporate managers have even tended to forego lucrative long-term engagements if pursuing them would negatively impact managers’ ability to meet short-term consensus estimates.³

“I’d be shocked beyond belief, and I’d get a gun out and shoot him if he doesn’t make what he promised now,” former General Electric CEO Jack Welch said on CNBC, referring to his successor Jeffrey Immelt’s earnings misses. “Just deliver the earnings. Tell them you’re going to grow 12 percent and deliver 12 percent.”

Source:http://www.nbcnews.com/id/24163368/ns/business-cnbc_tv/t/welch-says-ge-immelt-has-credibility-issue/#.W0-5L6epFGN

The commitment and consistency phenomenon comes into play, most particularly, when new information calls into question the validity of public statements previously made. Once an executive takes a public stance on the company’s expectations, she knows she will be measured against that stance, and the desire to be consistent starts to make it difficult for her to concede to revising expectations previously set, even in the face of evidence such as declining demand or softening prices. Thus the natural tension begins when economic conditions change in a way that renders prior estimates, with which the company is deeply vested, overly optimistic.

Management is often able to scale back its estimates slowly; in other situations, managers might be so committed to previous estimates that they stubbornly maintain increasingly unlikely estimates, sometimes deluding themselves that they are realistic. The consistency principle

can manifest in management needlessly defending projects or espousing their supposed benefits rather than risk being seen to be flip-flopping. Executives might maintain for too long outdated estimates that need to be revised: executives, to justify any perceived inflexibility, might internally or publically attribute any negative conditions to the vagaries of a fickle marketplace that will imminently rebound. This “wait-and-see” approach, in lieu of lowering overstated estimates, is a tactic disparagingly referred to as “delay and pray.”^f

Before further examining commitment and consistency principles at work, we note that the theory is nuanced: not all public statements trigger an internal pressure for consistency. Many public statements are just that — statements — which may be made for any variety of *business* reasons (e.g., the desire to avoid investor scrutiny, or for competitive reasons). That is, some public statements, especially when they are not made by executives, do not bring with them the need for consistency. Management need not be defensive about all estimates made, as they are not always being marked on their performance, accuracy, or reliability.

Some examples include:

Brokerage house’s equity ratings. Enron filed for Chapter 11 bankruptcy on December 2, 2001. But according to *Forbes*, as late as October 18, 2001 — two days *after* Enron’s 3Q2001 earnings release revealed massive losses and writedowns stemming from complex structured finance vehicles — all 15 of the equity analysts tracked by Thomson Financial/First Call who were following Enron still had a “buy” recommendation on the company’s stock.⁴

Brokerage houses have often been found to maintain stale estimates of their prospects for other firms. As Silver (2015, p. 356) explains in the context of Enron, “even if these firms know that the party is coming to an end, it may nevertheless be in their best interest to prolong it for as long as they can.”

There are several possible explanations: First, the desire to stay in the good graces of the covered firm’s management may color the opinions of brokerage firm analysts,⁹ culminating in equity analysts leaning towards being optimistic, or *willfully* remaining content with an overly-optimistic estimate despite a more realistic expectation to the contrary. There may also be a business opportunity in publicly maintaining an outdated opinion, in that it allows time for the brokerage house to provide “choice” clientele with early warning as to the impending change. In fact, J.A. Busse et al. (2012) provide some evidence that

^f “Delay and pray” describes the tendency for management to defer the re-pricing, usually writing down, of certain assets, in the hope – or prayer – that the economic environment will change favorably in such a way that would render the writedowns unnecessary. Or sometimes executives wait for some good news to come so that they can combine the good news with the bad news, and make the bad news seem less problematic to shareholders. “Our profits are down *but* we laid off employees (which will lower our future costs).”

⁹ One reason traditionally ascribed to analysts’ desire to curry favor with corporate management has been that analysts hope to help their firms win investment banking business from the companies they cover. However, this has likely been a less prominent factor since barriers were erected between banks’ research and investment banking businesses, following the \$1.4 billion 2003 Global Analyst Research Settlements (<https://www.sec.gov/news/speech/factsheet.htm>). More likely, analysts may be motivated to stay in good standing with corporate management because it allows the analysts to offer corporate access to the bank’s buy-side clients wishing to meet with company managers: the offering of perks purportedly drives execution flow business to the bank.

brokerage firms' stock analysts know, privately, when a stock is a loser (i.e., they would recommend selling the stock) well before they are prepared to say so publicly.^h

Commitments by corporations to defend litigation against them. Companies habitually deny wrongdoing alleged in lawsuits filed against them — countering that the plaintiffs' claims lack merit — and publically pledge to *vigorously* defend themselves against the “meritless” claims.ⁱ

In these cases the public statement can be (1) part of a public-relations initiative to minimize the impact of the negative press associated with the announcement of the litigation, (2) a tactical decision made by the firm in advance of negotiations with the plaintiffs, or (3) a means of assuring investors that the litigation is nonthreatening to its prospects.

But publicly asserting that claims lodged against it are meritless and will be fought vigorously does not seem to be an impediment to companies settling them expeditiously. For example, Barclays Bank issued a statement on April 11, 2014, in which it declared that claims asserted against it by the FHFA were “without merit” and that it “intends to defend them vigorously.”⁵ Barclays promptly reversed course, settling the matter a mere 12 days later, in the amount of \$280 million.

Examples of Commitment and Consistency Getting the Better of Accuracy

Goldman Sachs vs. Merrill Lynch

Goldman Sachs navigated the hazards of the financial crisis more prudently than most of its immediate broker-dealer rivals (Bear Stearns, Lehman Brothers and Merrill Lynch) and most of the larger bank holding companies too, such as Citigroup and Bank of America.

Goldman v Competitors: Pre- and Post-Crisis Return on Equity (ROE) by Quarter (Annualized)

	1Q07	2Q07	3Q07	4Q07	1Q08	2Q08	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09
Goldman Sachs	29.1%	19.7%	24.0%	26.2%	12.0%	16.9%	6.9%	-14.7%	11.1%	21.4%	19.6%	28.7%
Bank of America	15.6%	17.0%	10.8%	0.8%	3.2%	8.6%	2.9%	-4.2%	8.2%	5.2%	-1.6%	-0.3%
Bear Stearns	17.4%	10.9%	5.2%	-27.6%	3.9%	—	—	—	—	—	—	—
Citigroup	16.6%	19.9%	6.9%	-32.7%	-16.9%	-7.5%	-8.6%	-51.6%	4.4%	11.4%	0.3%	-20.4%
JPMorgan	16.4%	14.3%	11.3%	9.8%	7.6%	6.2%	1.5%	1.8%	5.1%	6.7%	9.1%	8.0%
Lehman	23.4%	24.8%	16.6%	16.0%	8.3%	-43.4%	—	—	—	—	—	—
Merrill Lynch	21.4%	20.4%	-22.2%	-111.5%	-22.9%	-52.2%	-56.4%	-217.2%	49.8%	-20.7%	7.3%	46.3%
Morgan Stanley	29.1%	26.7%	16.5%	-43.2%	19.2%	12.1%	16.2%	-21.2%	-1.4%	1.2%	5.8%	4.7%

Source: Bloomberg L.P., with calculations by PF2

Some might attribute that to the fact that Goldman Sachs is the smartest global investment bank, with astute management overseeing state-of-the-art operations and superior risk management processes. Indeed, its “sharpness” may provide an instructive clue as to why Goldman, alert to the changing nature of mortgage performance, was most effective in trading its way out of risky exposures (off-loading its long

^h See also the *Wall Street Journal* article: “Regulators Examine Goldman’s Trade Tips,” which reports that “analysts at Goldman sometimes shared with traders and key clients short-term trading tips that sometimes differed from the firm’s long-term research.” <https://www.wsj.com/articles/SB125115914476055403>.

ⁱ In fact, these statements are often tendered by a company’s spokesperson, rather than by executives. The company’s spokesperson would typically have no vested (financial) interest in the subsequent performance of her estimates, and little ability to influence the decision to maintain or reverse an estimate.

positions and adding shorts) while also most aggressively requiring its trading counterparties, like AIG, to post additional collateral against risky assets.

What made Goldman determine to act boldly and swiftly, walking away from what had been, for them, a very profitable business up until that moment?

We return to the credible theory that Goldman was able to alter its subprime mortgage stance because its executives did not have an emotional investment in that business line: Goldman did not regard itself as one of the top manufacturers of residential mortgage-backed securities (RMBS) and collateralized debt obligations (CDOs). Even though it had a fully vertical operation for structuring CDOs, its public identity as a dominant investment bank was not inexorably linked to that business.

“[On] December 14, 2006, Kevin Gasvoda, [Goldman’s] head of the Mortgage Department’s Residential Whole Loan Trading Desk, instructed his staff to undertake an immediate, concerted effort to sell the whole loans and RMBS securities in Goldman’s inventory and warehouse accounts, focusing on RMBS securities from Goldman-originated securitizations. ... [By] the end of February ... Goldman’s inventory of “subprime loans [had] decreased from \$6.3bn to \$1.5bn,” In addition, during the first quarter of 2007, the Mortgage Department drastically slowed its RMBS origination business and its purchase of whole loans and RMBS securities. Those actions meant that Goldman was not only reducing its inventory, **but also reducing its intake** of what had previously been a constant inflow of billions of dollars in whole loans and RMBS securities purchased as part of its securitization business.”

Source: U.S. Senate Permanent Subcommittee on Investigations (2011)

Goldman, unlike Merrill (see below), was not at the time predisposed to maintaining or growing its CDO market share.

Thus, when a pair of astute Goldman traders identified looming weakness in the CDO market, they did not have to overcome institutional commitment to subprime mortgages in order to express that view and short (i.e. bet against) the CDO market. According to accounts of Goldman’s prescient positioning before the financial crisis unfolded, then-CFO David Viniar was particularly concerned about offsetting the firm’s subprime exposure. Likewise, as the CDO market began to crater, Goldman’s then-head of mortgages Dan Sparks recommended cancelling pending CDO deals and exiting long positions expeditiously, even if it meant taking a loss.⁶

A firm more committed to the CDO business might have eschewed locking in losses, and instead waited (fruitlessly in this case) for the CDO market to bounce back.

By early 2007, not only was Goldman *trading* its way out of its risky exposures, but it had already implemented *structural changes*, shutting down its mortgage operations.

CEO’s Influence on Culture

Unlike Merrill’s CEO, Goldman’s CEO Lloyd Blankfein came from a trading background – not a leveraged finance, investment-banking background. This may arguably have influenced Blankfein in viewing Goldman’s mortgage exposure objectively from a risk-reward perspective, rather than being emotionally attached to the idea of growing the structured finance business.

In early 2007, Blankfein was actively steering his personnel to reduce undesirable risk exposures. After reviewing a report concerning the Mortgage Department’s efforts to reduce certain exposures, Blankfein asked the preparer:

“[Y]ou refer to losses stemming from residual positions in old deals. Could/should we have cleaned up these books before and **are we doing enough right now to sell off cats and dogs** in other books throughout the division?”

Source: U.S. Senate Permanent Subcommittee on Investigations (2011), with emphasis added.

Lehman Brothers, by comparison, would not shut its subprime unit until August 2007⁷; Merrill Lynch would not wind down its First Franklin or Lake Forest units until March 2008.⁸

While Goldman was closing its mortgage business, Bank of America was doubling down on its bet on mortgages (purchasing a \$2 billion stake in Countrywide in August 2007 and then announcing in January 2008 that it would acquire all of Countrywide, with the deal completed in July 2008).⁹

Overall, Goldman’s management and personnel ought to be commended for moving with alacrity to manage their risks and protect their shareholders’ interests; but one explanatory factor for why they, and not others, were able to respond decisively is perhaps purely serendipitous: the subprime “issue” happened to occur in an area of the bank to which the firm’s management lacked a strong commitment.

Merrill Lynch, narrowly avoided Lehman Brothers’ fate by merging with Bank of America at the height of the financial crisis: it had found itself on the brink of failure due to its exposure to subprime mortgage-related assets such as RMBS and CDOs.

Under then-CEO Stanley O’Neal, who had previously run Merrill’s leveraged finance business, Merrill reportedly became fixated with the idea of dominating areas of structured finance, and out-gunning Goldman Sachs. Of course, in Merrill’s endeavor to seek out additional gains, Merrill needed to take more risks.

Top Underwriters of RMBS-backed CDOs

Underwriter	2002	2003	2004	2005	2006	2007	TOTAL
Merrill Lynch	0	3	20	22	33	18	107
Citigroup	3	7	13	14	27	14	80
Credit Suisse	10	7	8	9	14	6	64
Goldman Sachs	3	2	6	17	24	7	62
Bear Stearns	5	2	5	13	11	15	60
Wachovia	5	6	9	16	11	5	52
Deutsche Bank	6	3	7	10	16	5	50
UBS	5	2	5	10	16	6	46
Lehman Brothers	3	4	3	6	5	6	35
Bank of America	2	2	4	9	10	2	32
TOTAL DEALS	47	44	101	153	217	135	697

This table shows Merrill’s advancement under O’Neal from being a bit-player to being the dominant underwriter of RMBS-backed CDOs from 2004-2007. Merrill and Goldman both substantially reduced their underwriting activities by 2007 (from 2006 levels) with Goldman’s change being more pronounced. Unfortunately for Merrill, however, much of its 2007 issuance was arguably ill-conceived, with Merrill being forced to retain on its balance sheet a significant portion of the ABS CDO debt it underwrote but was likely unable to distribute.

Source: Anna Katherine Barnett-Hart, “The Story of the CDO Market Meltdown: An Empirical Analysis” (2009). <https://sites.hks.harvard.edu/m-rcbg/students/dunlop/2009-CDOmeltdown.pdf>

Merrill’s tremendous overall growth during the 2004-2006 period was largely attributable to its notable success in the CDO market (\$388 billion market as of 2006), where it had become the top originating institution. In mid-2006, following the departure of a key CDO employee, one Merrill executive reportedly “sought to reassure the CDO group that Merrill remained committed to the business, saying it would do ‘whatever it takes’ to remain No. 1 in CDOs.”¹⁰

One method of doing “whatever it takes” was to ensure that it kept the CDO machine humming, even after demand for super-senior tranches had begun to soften in 2006-2007. According to a *ProPublica*

report, it managed this by creating “a new group within Merrill, which took on the bank’s money-losing securities. ... The division creating the securities passed portions of their bonuses to the new group. ...”¹¹

To keep doing new deals and maintain its position atop the CDO leaderboard, despite market demand cooling off, Merrill added to its own balance sheet, particularly when it was unable to distribute all of the notes being marketed. The firm’s exposure to subprime mortgage-backed CDOs reportedly grew from \$5 or \$6 billion to \$55 billion in under one year.¹² Meanwhile, respected trader Jeff Kronthal was laid off and risk manager John Breit was demoted, both of whom had reportedly warned Merrill against taking too much CDO exposure.

Altogether, while Goldman Sachs was swiftly exiting its own exposure in early 2007,^j Merrill was catastrophically adding tens of billions of dollars of exposure.

From the top of its organizational chart, Merrill’s identity was so strongly linked with being the dominant player in the space that it was unable to reverse course in time to avoid catastrophic losses. When it finally announced a \$7.9 billion write-down in October 2007, mostly due to its CDO exposure, O’Neal acknowledged, “The bottom line is, we got it wrong by being overexposed to subprime.”¹³

Volkswagen (“VW”) Emissions

On September 18, 2015, the U.S. Environmental Protection Agency (EPA) issued Volkswagen with a *Notice of Violation*,¹⁴ a monumental turn of events that has already resulted in VW paying \$30 billion in fines and settlements with regulators and consumers world-wide.¹⁵ Volkswagen pled guilty to criminal charges in the U.S. that it had contrived to cheat emissions testing using a “defeat device” that lowered emissions during testing conditions.¹⁶

The VW scandal is well known and has been heavily covered by the global news media. What is more interesting to our research, however, is the fact that VW knew that regulators were investigating it for inconsistent emissions results well in advance of the September 2015 announcement^k — but VW continued its misconduct, despite knowing that it would inevitably be caught.^l

VW was not only slightly failing its emission levels. If the difference in emissions between real-world conditions and test conditions had been marginal, perhaps VW could have hoped to “explain it away” or that regulators might have given it a break. But in or around March 2014, certain VW employees learned of the results of a study conducted by the International Council on Clean Transportation (the “ICCT

^j According to Goldman, its subprime loan inventory was reduced from \$7.8 billion on November 24, 2006, to \$462 million on August 31, 2007, and the value of its inventory of subprime RMBS declined from \$7.2 billion to \$2.4 billion.

^k In May 2014, the West Virginia Center for Alternative Fuels, Engines and Emissions released a report that suggested that NOx emissions from Volkswagen diesel engines during real-world driving were 40 times higher than permitted levels, even though the emissions during testing conditions were acceptable. Two months earlier, the California Air Resources Board (“CARB”) and the US Environmental Protection Agency (EPA) had already begun to question Volkswagen about the discrepancies soon to be revealed in the West Virginia report. Rather than confessing to the defeat devices, for 18 months Volkswagen executives hid from prying regulators the existence of the defeat devices and offered false explanations for the discrepancies.

^l The German tabloid *Bild* reportedly claimed that top management had been aware of the software’s use to manipulate exhaust settings as early as 2007. <https://www.reuters.com/article/us-volkswagen-emissions-idUSKCN0RP14U20150927>

study") which showed that two of the three 2.0 Liter Subject Vehicles tested on the road, **"emitted NOx at values of up to approximately 40 times the permissible limit** applicable during testing in the United States."¹⁷

According to VW's guilty plea, after learning of the investigations into its violations by early 2014 (if not sooner), VW continued in 2014 and 2015 to evade and obscure the regulators' questions.

"In response to learning about the results of the ICCT study, engineers in the VW Brand Engine Development department formed an ad hoc task force to formulate responses to questions that arose from the U.S. regulators. VW AG supervisors, including Supervisors A, D, and E, and others, determined not to disclose to U.S. regulators that the tested vehicle models operated with a defeat device. Instead, Supervisors A, D, and E, and others decided to pursue a strategy of concealing the defeat device in responding to questions from U.S. regulators, while appearing to cooperate. ... Throughout 2014 and the first half of 2015, Supervisors A, D, and E, and others, continued to offer, and/or cause to be offered, **software and hardware "fixes"** and explanations to U.S. regulators for the 2.0 Liter Subject Vehicles' higher NOx measurements on the road without revealing the underlying reason - the existence of software designed to detect, evade and defeat U.S. emissions tests."¹⁸

In undertaking these new "fixes" while maintaining and covering up the misconduct, several VW employees further exposed themselves to criminal liability.^m Only in September 2015, shortly before the EPA's Notice of Violation and almost 18 months after the company had learned that regulators were investigating the outsized emissions discrepancies, did a VW employee finally give a partial admission to the EPA that the company was using defeat devices on its "clean" diesel vehicles.¹⁹

Part of the reason for VW's continued deception may be attributable to VW's having built so much of its identity and image around the success of the "Clean Diesel" project, as part of the company's plans to become the world's most successful automaker.

Back in 2008, VW dubbed its ambitious growth plan "Strategy 2018"²⁰ and subsequently referred investors to the highlights of this plan in its annual reports. A major focus of the growth strategy was producing fuel efficient and environmentally friendly cars. When discussing "Strategy 2018" in its annual reports, VW peppered its narratives with phrases depicting itself as an "environmental leader," a company which "gave top priority to ecological relevance," was "environmentally oriented," "set new environmental standards in vehicles,"²¹ and was "environmentally friendly."²²

VW's global growth strategy hinged on growth in the U.S. market, through its "Clean Diesel" engine: the company sought to increase annual core-brand sales to 800,000 vehicles by 2018.²³ An important part of VW's U.S. sales and marketing efforts — which were initially successful — involved the promotion of its diesel vehicles as low-emission, fuel-efficient cars that achieved performance comparable with gasoline vehicles. Its pitch to U.S. consumers was an affordable car that was environmentally responsible (low emissions) and fuel efficient, without sacrificing performance. Its answer to this heretofore impossible puzzle: "Clean Diesel" engines.

VW actively promoted its diesel vehicles as both "clean" and "green." Indeed, the company built much of its identity around the commercial success of its unique Turbocharged Direct Injection ("TDI") Diesel

^m While other executives are under investigation, at the time of writing one US-based VW executive who oversaw emissions issues has been sentenced to prison as part of a plea deal. <https://www.reuters.com/article/us-volkswagen-emissions/vw-executive-gets-seven-years-for-u-s-emissions-fraud-idUSKBN1E01W1>

vehicles. A March 2015 Product Strategy presentation included slides titled, "VW is a leader in clean diesel technology," "Diesel is an important differentiator for the VW Group," and "The TDI Advantage."²⁴

A December 2013 press release touted the success of its clean diesel vehicle sales:

"Selling more than 100,000 TDI Clean Diesel vehicles is a significant milestone for Volkswagen Group of America," said Mark McNabb, chief operating officer, Volkswagen of America. "We're excited to see the increasing numbers of customers able to enjoy the reliability, durability, fuel-efficiency and power of the clean diesel engine."

"The past year has shown that American consumers clearly recognize the benefits of clean diesel TDI vehicles," said Scott Keogh, President, Audi of America. "They understand now more than ever that this is a technology delivering real answers to society's concerns about fuel consumption and greenhouse gas emissions without compromises."²⁵

As such, one potential explanatory factor for why VW maintained and perpetuated a lie when faced with almost certain discovery, public humiliation, and criminal liability, was that its identity was so tightly wrapped with its ambitious growth projections and, in particular, the success of the diesel program.ⁿ

Reversing course would have required an overwhelming change in mental state.

JPMorgan and the London Whale

In 2012, Bruno Iksil, a trader in JPMorgan's Chief Investment Office (CIO), accumulated credit default swap positions in the division's Synthetic Credit Portfolio (SCP) that were so large that he ultimately became known as the *London Whale*. The size of the positions, combined with the lack of transparency into the potential downside, captured the attention of the financial press and investors alike.

On an April 13, 2012, earnings call, CEO Jamie Dimon initially characterized media and investor angst about the positions as "a complete tempest in a teapot,"²⁶ downplaying the likelihood of the suspect exposures souring to a material degree. (Dimon would later acknowledge that his comment was "dead wrong"²⁷ but that he had earnestly believed it at the time.) A month later, on a May 10, 2012, conference call with analysts, Dimon disclosed that losses on the positions had reached \$2 billion.²⁸ By the 2nd quarter earnings call on July 13, 2012, losses totaled \$5.8 billion. According to the Senate Permanent Subcommittee on Investigations, the final loss amount on the *London Whale* positions reached a formidable \$6.2 billion,²⁹ casting serious doubt over Dimon's comments in April 2012 that suggested there was little to worry about.

Investors later sued JPMorgan for the misleading statements about these trading positions, eventually settling with the bank for \$150 million.³⁰ JPMorgan also settled with US and UK regulators for a total of

ⁿ There are other potential factors that may have influenced VW's decision-making. For one, VW admitted that at a late stage in August 2015, it continued to conceal the defeat device while seeking approval from the California Air Resources Board ("CARB") to sell its Gen 3 model year 2016 2.0 Liter Subject Vehicles in the U.S. Thus, according to VW, a business reason influenced the decision to continue concealment. This is only, however, a partial explanation, as any approval given on faulty grounds could subsequently be revoked. Further, it does not necessarily explain the decision to conceal the defeat device throughout the period of concealment. (<https://www.justice.gov/opa/press-release/file/924436/download>)

\$920 million,³¹ even admitting wrongdoing, although the regulatory actions covered the bank's actual risk management processes in connection with the losses – not the public disclosures to investors.

The question arises as to why Dimon was initially dismissive of outside concern for potential losses on the *London Whale* positions.

In light of his “tempest in the teapot” remark, one possibility is that Dimon was slow to internally or publicly acknowledge deficiencies in the bank's risk management processes because the firm's identity was so strongly tied to risk management competence.

For one, Value-at-Risk (“VaR”), the key risk measure found to have been improperly applied within JPMorgan's CIO,³² had originally been developed by JPMorgan's RiskMetrics^{33,°}

JPMorgan's emergence from the financial crisis, relatively unscathed (compared to peers such as Bank of America and Citigroup), was often attributed to Dimon's prudent approach to risk management. Dimon has described himself as “a conservative manager”³⁴ and has been regarded by some as the “ultimate chief risk officer of the bank.”³⁵ Dimon extols the virtues of JPMorgan's “fortress balance sheet” and its balance sheet strength, while espousing the conservative nature of the bank's accounting practices:

“To me, having a fortress balance sheet means you have plenty of capital and practice conservative accounting”³⁶

And, finally, Jamie Dimon is also known for “his tendency toward micromanagement.”³⁷ A \$6 billion loss occurring on his watch may have caused some investors to question their appraisal of JPMorgan's management generally (and Jamie Dimon in particular); JPMorgan, importantly, differentiates itself by management performance and competence, which is paramount for banks, given that several of their products, like commercial loans, are heavily commoditized.

In short, one explanatory factor for delaying appropriate disclosure of the *Whale Trade* may have been simply that Jamie Dimon's reputation was on the line, and that JPMorgan's image was tightly connected to its image as a well-managed, prudent and studious taker of risk.^p

Continued Reliance on Flawed Credit Rating Models

Credit rating agencies, like Moody's, often pride themselves on their quantitative abilities: their ability to model and measure risk is fundamental to their value proposition.

Leading into the crisis, Moody's came to realize that its models were not accurately capturing the mortgage risk inherent in the RMBS structures, which meant its RMBS ratings would be wrong, and in turn its ABS CDO ratings would also be wrong, as those ABS CDO ratings relied on the RMBS ratings being right.

[°] RiskMetrics was eventually spun off as a separate entity; it then went public and was subsequently acquired by MSCI.

^p Another explanation may be that JPMorgan felt it would be easier to exit its large position if the market did not know the level of its exposure. But this explanation is unlikely to be satisfactory, as the relevant market players and counterparties seem to have understood the true nature of JPMorgan's position at the time, even while its true nature was being obscured from JPMorgan's shareholders.

The Financial Crisis Inquiry Commission, which would later investigate the crisis-era shortcomings at Moody's and other financial firms, found that rather than admit to the problem and halt its rating of new issues, Moody's persevered, unabated, with a flawed model:

“Moody's, the Commission's case study in this area, relied on flawed and outdated models to issue erroneous ratings on mortgage-related securities, failed to perform meaningful due diligence on the assets underlying the securities, **and continued to rely on those models even after it became obvious that the models were wrong.**”³⁸ (with emphasis added)

Valuation Issues (Delay-and-Pray)

Shareholders' expectations are top-of-mind for corporate managers: management's performance is often judged relative to targets, often set by the company itself.

If market conditions become more challenging than anticipated, business prospects and asset valuations may suffer, putting previously articulated estimates at risk. Public company executives, facing potential underperformance relative to their prior guidance or the market's expectations, may not want to recognize losses at inopportune moments.

What might begin as a seemingly benign attempt by management to meet previous guidance (for example, by temporarily delaying expenses or pulling forward billable revenues), can escalate into something more troublesome, especially if the conditions that precipitated the original shortcomings deteriorate further, rather than improve.

Some firms might stave off write-downs or lowering guidance, “delaying-and-praying” in the hope that a forthcoming market improvement can halt or reverse the deteriorating situation in question. Other firms might be tempted to postpone a negative announcement so as to accompany it with an imminent shareholder-friendly disclosure (for example, a corporate action), in the hope that the potency of the newly-disclosed issue will be minimized or lost when joined with the accompanying positive news.

Executives often feel pressure to meet their quarterly forecasts, but "it can often put a company in a position where management from the CEO down feels obligated to deliver earnings and therefore may do things that they wouldn't otherwise have done," JP Morgan CEO Dimon said in an interview with CNBC.

Source: <https://www.cnbc.com/2018/06/06/warren-buffett-and-jamie-dimon-join-forces-to-convince-ceos-to-end-quarterly-profit-forecasts.html>

In the context of loan receivables, companies might (disturbingly) be induced to adjust loan terms so as to make them temporarily *appear* to be more promising to shareholders.

One option is to re-write contracts for delinquent loans — to extend them or change the interest due — in such a way that the debtors are no longer technically designated as *delinquent* on payments. This sometimes works sustainably, especially when debtors only need a bit of leeway before coming current again. However, in many instances this is simply a manifestation of wishful thinking on the part of the asset owner, whose hopes of improved asset performance are tied to a market or economic rebound that does not come to fruition. A market slowdown can magnify or exacerbate the problem, with those who have extended their loans or delayed their write-downs being forced into a day of reckoning.

It is in this context of “delay and pray” that Warren Buffett is regularly quoted as saying: “you only find out who is swimming naked when the tide goes out.” Some illustrative examples follow:

- **Rio Tinto:** In April 2011 Rio Tinto, one of the largest mining companies in the world, purchased coal assets in Mozambique for \$3.7 billion. Rio Tinto's subsequent post-acquisition public statements,

including its 2011 Annual Report (published March 5, 2012), indicated that the company felt it was appropriate to maintain its pre-purchase projections:

*"In this report, the reserves and resources figures for our Mozambique coal assets are published for the first time since Riversdale was acquired by Rio Tinto. The magnitude of the reserves and resources figures **is consistent with our original estimates** that were calculated during our due diligence studies."³⁹*

- 2011 Annual Report, March 5, 2012, with emphasis added

According to the SEC, Rio Tinto maintained its original valuation throughout 2012 and into 2013, at which time a company executive purportedly alerted the chairman of the materially inflated valuation. Soon after, the company reduced the valuation by \$3 billion and eventually sold the subsidiary in 2014 for a mere \$50 million.

Importantly, the SEC determined that Rio Tinto's management had been made aware much sooner that its estimates were unsupported, and ought to have been more expeditiously revised. In 2017, the SEC charged Rio Tinto and former executives with fraud, alleging they failed to appropriately follow accounting standards in the valuation of these coal assets. According to the SEC, "... by the end of 2011, Rio Tinto knew that it could transport and sell only about five percent of the amount of coal it had originally assumed. Rio Tinto also learned that there was significantly less and lower quality coal than it had assumed at acquisition."⁴⁰

- Tesco: In September 2014, UK-based Tesco admitted in a press release that it had previously overstated "its expected profit for the half year, principally due to the accelerated recognition of commercial income and delayed accrual of costs."⁴¹
- Steinhoff International Holdings: Regulators from South Africa, Germany, and the Netherlands are investigating the multinational furniture retailer,⁴² while PwC is reviewing Steinhoff's off-balance sheet transactions, which may have been used to inflate revenue and hide losses. (Within a month of the revelation, Steinhoff shares had fallen roughly 90%, a drop of \$15 billion in market capitalization.)
- Quintis: Shareholders have sued Quintis, an Australian sandalwood company, alleging the company failed to disclose in a timely manner that one of its largest customers had terminated a supply contract. (When Quintis disclosed the contract cancellation in May 2017, its shares fell 76%; trading in the company's stock has been halted since May 2017.⁴³)
- ExxonMobil: When oil prices plummeted in 2014 and 2015, most major oil and gas exploration and production companies wrote down the value of their oil assets, with total write-downs amounting to roughly \$50 billion.⁴⁴ One exception was ExxonMobil, which left its valuations unchanged. News reports in September 2016 indicated that the SEC was investigating ExxonMobil's valuation practices. In February 2017, roughly a year after its competitors' oil price-driven write-downs, the company disclosed write-downs on some of its assets, particularly its oil sands assets.
- Royal Bank of Scotland (RBS): As part of a UK shareholder lawsuit against RBS, a former head of the bank's fixed-income independent price verification team testified that during his brief tenure at RBS in the autumn of 2007, he had warned his superiors of mismarked asset-backed securities (ABS) held on the bank's balance sheet. RBS settled that case in May 2017 but denied that it should have repriced the assets earlier.⁴⁵

Solutions

"When my information changes, I alter my conclusions. What do you do, sir?"

- Apocryphal, but regularly attributed to John Maynard Keynes

The psychological challenge we confront in this paper is that once people have taken a stand, they tend to encounter personal and societal pressures to act in a way consistent with that stand: it is those pressures, whether recognized or subconscious, that cause people to act in ways consistent with their prior actions.

The “solutions” we put forward here therefore need to combat pressures to remain consistent with estimates, especially to the degree the pressure is subliminal. Our solutions, therefore, encourage firms to make it easier to change course, by making one or a combination of structural changes:

First, Reduce the Propensity for Problematic Estimates.

Instead of making difficult-to-meet and awkward-to-reverse commitments, we propose that companies avoid providing public guidance involving “hard” estimates.

When making public statements, companies should explain the conditions that might necessitate revisiting these statements, thus laying the groundwork for a potential change in opinion that can be explained and justified, and is therefore less surprising.

While hedging one’s articulated projections may seem weak, it helpfully turns the hard estimate into a larger statement.

“It is wise to take admissions of uncertainty seriously, but declarations of high confidence mainly tell you that an individual has constructed a coherent story in his mind, not necessarily that the story is true.”

– Daniel Kahneman

Publicizing the decision-making process turns the desire for consistency into an asset instead of a liability: rather than feeling pressure to maintain the *estimate*, the executive would feel pressure to maintain the *process*. A revision would not be seen as a departure from a previous public position, but as an update to the position that accommodates changing conditions. In making the necessary update, the executive would demonstrate a consistency with previous descriptions of the conditions, now realized, that would lead the projection to be altered.

Examples: Moody’s Rating of Tesla’s Bonds and Consumer Report’s Rating of the Model 3

When **Moody’s** rated Tesla’s \$1.8 billion bond issue in August 2017, Moody’s noted certain conditions that would prompt it to subsequently revise its rating for better or worse, including metrics specifically linked to the achievement of production targets:

“The rating could be downgraded if there are major production or quality problems for the Model 3, if consumer demand erodes to the degree that the company cannot maintain its 5,000 per week production target through 2018, or if the level of Model 3 reservations supported by \$1,000 deposits fall from the current level of 455,000 to below 350,000.”⁴⁶

Tesla subsequently missed its production targets, and Moody’s promptly downgraded Tesla in March 2018, explaining that their downgrade “reflect[s] the significant shortfall in the production rate of the company’s Model 3 electric vehicle.”⁴⁷ Again, in March 2018, Moody’s set guidelines that would encourage it to upgrade or further downgrade Tesla’s bond rating.

Separately, on May 21, 2018, **Consumer Reports** (“CR”) announced that it was unable to recommend the purchase of the Tesla Model 3, Tesla’s attempt at a mass market vehicle.

CR explained that, “Our testers also found flaws—big flaws—such as long stopping distances in our emergency braking test and difficult-to-use controls. These problems keep the Model 3 from earning a Consumer Reports recommendation.”⁴⁸

Tesla was reportedly able to improve its braking speeds by way of a software update that it could release “over-the-air,” which it promptly did. CR, on the back of the new braking speeds, reversed its position only nine days later, newly recommending the Model 3.⁴⁹

Moody’s and Consumer Reports were both better positioned to change their recommendations because they had explained the reasons supporting their verdict, allowing them to seem deliberate when changing their stances, rather than appearing indecisive.

Second, Create a Culture of (Constant) Measurement.

To the extent important “hard” estimates are provided to the public, we encourage a process that enables those estimates to be continuously monitored and adjusted.

Many people feel committed to a statement once made or to a set of beliefs steadfastly held. Tetlock and Garner (2015) note that “[social] psychologists have long known that getting people to publicly commit to a belief is a great way to freeze it in place, making it resistant to change.”

But Tetlock finds in his work that one of the reasons certain predictive analysts are particularly astute — he calls them *superforecasters* — is that they have the advantage of not being too attached to their forecasts. As such, when the information changes, they can change their minds.

One of the superforecasters Tetlock measures prides himself on his ability and willingness to change his opinions, with greater frequency than his colleagues or competitors. But even that analyst found the force of inertia difficult to overcome when the forecast’s topic sits well within his presumed area of expertise — in those moments in which he feels he has a particular “investment” in the accuracy of his then-current forecast.

Create a culture and mindset that encourages being consistent with procedures and regularly revising measurements.

Unfortunately, models are too often built to engineer and justify a conclusion that has already been conceived. Thus, the assumptions that go into the model are driven by the outcome desired, rather than driving the outcome. But if corporations force themselves to mark their estimates to market and to constantly test their assumptions, they can create a culture of verification and authentication.

Altogether, a culture of measurement brings with it several advantages:

- *Regular measurement* improves the quality of measurements over time, which is a positive for a company (and its stock) as investors value reliable estimates.
- *Regular measurement* reduces the likelihood of outsized downward stock price corrections, which is a positive for the company’s stock price.
- *Regular measurement* demands the maintenance of written policies and procedures, which in turn act as helpful checks and balances on management’s and employees’ activities. Importantly, well-documented procedures can turn the pressures of *consistency* to the company’s advantage, encouraging individuals to maintain the integrity of the processes and follow the formalized procedures (rather than being committed to the public statement itself). Procedural (and mental) contortions, then, would be required to bypass the written policies.

- *Regular measurement* allows for the earlier detection of developing problems, which can be better managed internally, or disclosed, before escalating into larger problems.

Regular measurement, more timely disclosures, and well-documented and maintained policies and procedures can together act to limit:

- asset-level risks;
- employee-level risks (such as the potential for rogue-trading);
- management-level risks;
- reputational risks;^q
- legal risks and costs^r

Third, Ensure Disinterested Individuals Oversee Estimates.

Some corporate structures are more vulnerable to the commitment and consistency phenomenon interfering with sound practices. A company in which a single individual consolidates power and decision-making is more prone to falling prey to the downside of commitment and consistency: a powerful individual would be more heavily vested in the commitment than a team would be, since his own self-image is often tied to the commitment (while each team-member would have a more diffused commitment).

Managers and employees may be least likely to reverse optimistic outcomes if their salaries depend on stock performance, especially if they have stock options expiring in the near term. Personnel whose self-esteem or commercial prospects are tied to the outcomes of their decisions are thus less likely to downgrade predictions or reverse course.

Therefore it is important to ensure that the people making the judgments have little ego invested in the outcomes. To the extent important “hard” estimates are provided to the public, senior executives (including board members) can push to ensure that the parties updating those estimates are separated from their outcomes, enabling “independent” personnel to run the *measurement* business.

Too often nominally independent functions (including external auditors) have negligently accepted management’s biased inputs — Enron, WorldCom, Lehman Brothers, Madoff Funds, and Allied Irish Bank to name a few — thereby clouding the independence of their role and allowing the financials (through the projections that are used in valuation models) to become a function of management’s optimistic hopes, rather than a portrayal of reality.

^q The 2018 Edelman Trust Barometer continues to show *Financial Services*, globally, as the least trusted of the industries it measures, despite some recent gains. <https://cms.edelman.com/sites/default/files/2018-01/2018%20Edelman%20Trust%20Barometer%20Global%20Report.pdf>

^r The Conduct Costs Project Report 2017 shows cumulative conduct-related costs (including provisions), among 20 international banks, amounting to GBP264 billion for the five-year period ending December 31, 2016. <http://foreigners.textovirtual.com/ccp-research-conduct-costs/274/221515/conduct-costs-project-report-2017-updated.pdf>

Conclusion

Companies might intentionally make false statements for any number of reasons. They might hope to get away with it (at least temporarily), benefitting in the meanwhile, say, by raising capital at favorable levels or seeking other competitive advantages, like capturing market share.

There are various forms of corporate mismanagement, especially when executives formulate plans to hit performance targets or stave off criticism. Some examples are described herein, in which executives masked the true nature of their financial position from their shareholders. Others include more sophisticated forms of financial engineering, many of which came with sign-off from the firms' auditors, only to be found to be misleading by bankruptcy examiners (e.g., Enron's off-balance sheet Rhythms and Raptors transactions or Lehman Brothers' Repo 105 usage, which reduced the firm's reported leverage).

These contraventions are often due to public pressure and might result from management's desire to meet overly optimistic projections. Sometimes innocent efforts to meet targets can spiral out of control. Had management not made such aggressive estimates, or had their employees judiciously revised them when applicable, some of these great *unwindings* may never have been necessary.

Whether it be Volkswagen delaying recognition of faulty emissions disclosures, Bank of America "doubling down" on mortgages heading into the financial crisis or Jamie Dimon talking down the risk of the *London Whale* trades, it may be that the pressure exerted on executives to be consistent with prior estimates, or with their self-image, explains their failure to expeditiously diagnose their shortcomings and publicly disclose them. We also highlight firms, such as Goldman Sachs, that were able to reverse course in part, perhaps, because they were not as heavily vested in a particular outcome or the business line at issue.

Sometimes, merely understanding the root causes of a problem allows one to fix it. But if the pressures are difficult to detect or subliminally-driven, as in the cases we describe, merely identifying them may not suffice in tackling it.

We therefore recommend solutions that require specific actions to be taken.

Importantly, the solutions aim to remove the hurdles and disincentives to reversing course. They seek to assign individuals the responsibility of maintaining accurate and up-to-date models, and the obligation to update their stakeholders of any material developments on a timely basis.

We propose adding qualifying statements when making public statements that hinge on estimates, so that economic changes that should lead to a change of course can more readily be referenced and acted on, creating a positive feedback loop.

A company's failure to appropriately document its measurement techniques allows vested individuals latitude to find "creative" ways to meet their guidance. But strong measurement specifications can mitigate the potential for misconduct: they turn commitment and consistency into an asset, encouraging individuals to be consistent in revising their estimates as conditions change.

* * *

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¹⁸ Statement of Facts accompanying VW's plea, with emphasis added.

¹⁹ <https://www.cnn.com/2015/09/24/how-volkswagen-fought-epa-on-emissions-cheating-claims.html>. According to the documentary film "Hard NOx," the admission only came after the EPA threatened to withhold certification for *all* 2016 VW vehicles, not just its diesel vehicles.

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