

Leithner Letter No. 229-232: 26 November 2018-28 February 2019

To be sure, there is a risk for companies associated with climate change but it has almost nothing to do with the climate changing (the incidence of extreme weather events is declining). It has almost everything to do with the menace for companies of dealing with absurd and unpredictable changes enacted by shallow, ill-informed politicians and regulators.

Judith Sloan

*“Jumped-up Geoff [Summerhayes] Is Proof We Need Fewer Regulations”
(The Australian, 28 February 2017)*

“Factfulness” is the stress-reducing habit of only carrying opinions for which you have strong supporting facts.

Hans Rosling

*Factfulness: Ten Reasons We’re Wrong about the World –
and Why Things Are Better Than You Think (2018)*

... The [IPCC report released yesterday](#) ain’t science. It doesn’t set out refutable hypotheses and test them. In fact, we don’t even have reliable data on global temperatures. Using climate models to support predictions of future disasters is actually not that far from making astrological prophecies ... Luckily, ... Prime Minister [Scott Morrison] recognises the essentially fraudulent nature of these international reports ...

For anyone who wants to spend time on yet another IPCC report predicting future climate cataclysms, I recommend you read [Nassim Nicholas Taleb’s](#) latest book [[Skin in the Game: Hidden Asymmetries in Daily Life](#), Random House, 2018]. He makes the distinction between science and scientism. The IPCC report is a clear example of the latter, with all its fancy concocted charts and tables pretending to be based on real science undertaken by distinguished scientists when it is nothing of the sort ... In sum, “scientism is to science what a Ponzi scheme is to investment.”

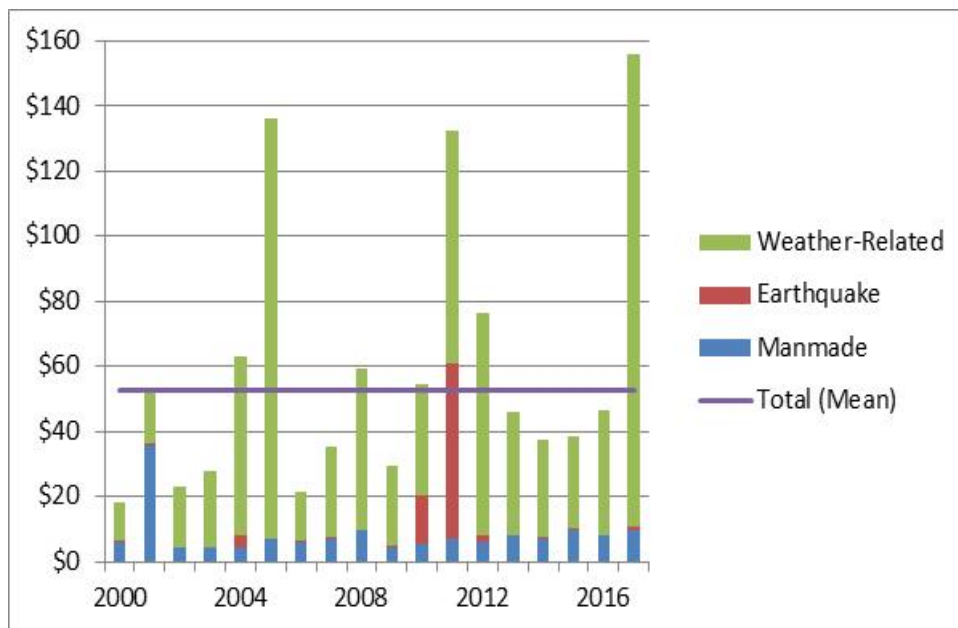
Judith Sloan

*“If Disaster Is Nigh, at Least We’ll Be Spared This Amateur-Hour Claptrap”
(The Australian, 9 October 2018)*

Man-Made or Natural “Climate Change” – or Merely Extreme Weather?

On 3 October 2017, Australia’s largest insurer, QBE Group Ltd, warned that 2017 could be “the costliest year in the history of the global insurance industry.” Further, “extreme global catastrophe” losses during the year would push its results firmly into the red. (In January 2018 it estimated that loss could reach a record \$US1.2 billion; the actual figure, announced in February, was \$US1.25 billion.) Also in October 2017, a leading global reinsurer, MunichRe, reckoned that global insured losses in 2017 would likely exceed \$US170 billion (it subsequently revised this figure to \$144 billion). At its AGM on 2 May 2018, QBE confirmed that “this level of insured catastrophe losses was, by a small margin, the highest ever recorded.” Losses in 2017 were approximately three times the annual average (\$US53 billion) since 2000 (see Figure 1, which plots data collected by another major reinsurer, SwissRe, and published in *The Wall Street Journal* on 7 September 2017).

Figure 1:
Three Categories of Global Insurance Loss from Disasters
(Billions of Nominal \$US), 2000-2017



Why was 2017 such a bad year? It wasn’t the consequence of manmade disasters (which exclude war but include terrorism): since 2000, their annual cost has averaged ca. \$US10 billion per year; the greatest loss, \$US38 billion in 2001, stemmed from the attacks in the U.S. on 11 September. The cost of manmade disasters in 2017 was, from a long-term point of view, roughly average. Similarly, earthquakes don’t explain why 2017 was so bad. Their cost can be considerable (see p. 20) but occurs infrequently: in most years – including last year – it has been close to zero; the aver-

age is less than \$US1 billion per year; and the greatest cost (\$US54 billion) occurred in 2011 as a result of major quakes in Japan and New Zealand. In sharp contrast, major storms – particularly tropical storms – are constant and costliest: they occur every year, the annual average cost is ca. \$US40 billion and “spikes” occurred in 2005 (\$US129 billion stemming mostly from Hurricane Katrina) and 2017. On average since 2000, weather-related disasters have comprised 76% of the annual losses plotted in Figure 1; manmade disasters have generated an average of 19% and earthquakes 5%. *In short, 2017 was a very bad year because major storms were particularly costly.* Indeed, by my reckoning – and bearing in mind that valid and reliable estimates of insured damage outside the U.S. mostly don’t exist before 1970 – three of these storms rank among the costliest in recorded history (Figure 2).

Figure 2:
Top-10 Costliest Natural Disasters, 1970-2017
(Insured Losses, Billions of 2018 \$US)

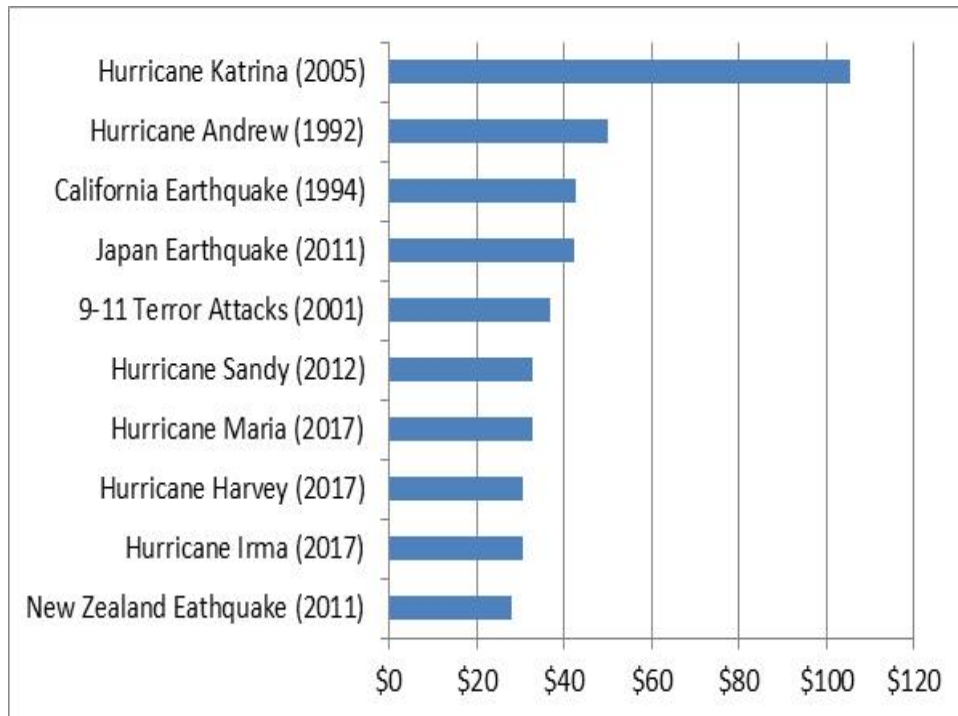


Table 1, which summarises data from the U.S. National Oceanic and Atmospheric Administration, elaborates this result (see NOAA National Center for Environmental Information, [U.S. Billion-Dollar Weather and Climate Disasters](#)). In the U.S. from 1980 to 2017, 218 natural disasters cost at least \$US1 billion (whether insured or uninsured). That’s an average of almost six disasters per year. Their total cost has been ca. \$1.5 trillion; even worse, they’ve taken almost 10,000 lives. From the point of view of loss of life and material damage, tropical storms are by far the costliest category of natural disaster: they account for one-third of deaths (more than any other category) and more than one-half of total cost.

**Table 1:
Billion-Dollar, Weather-Related Disasters Affecting the U.S.,
1980-2017 (Current \$US)**

Type of Disaster	No. of Events	Frequency (%)	Total CPI-Adjusted Losses	% of Tot Loss	Average Cost per Event	No. of Deaths
Drought	25	11.4	\$236.6	15.4	\$9.5	2,993 ¹
Flood	28	12.8	\$119.9	7.8	\$4.3	540
Freeze	8	3.7	\$27.6	1.8	\$3.5	162
T'storm & Tornado	91	41.6	\$206.1	13.4	\$2.3	1,578
Tropical Storm	38	17.4	\$850.5	55.3	\$22.4	3,461
Wildfire	15	6.8	\$53.6	3.5	\$3.6	238
Winter Storm	14	6.4	\$43.1	2.8	\$3.1	1,031
TOTAL	219	100%	\$1,537.4	100%	\$7.0	9,985

For Americans and Australians, four tropical storms that occurred in 2017 are particularly noteworthy:

1. *Cyclone Debbie (March)*

Debbie was the strongest tropical cyclone to reach Australia since Quang in 2015; given its path through populated areas, it's also regarded as the most dangerous storm to strike Queensland since Yasi in 2011. Debbie caused an estimated A\$2.4 billion of damage and 14 deaths – primarily in Queensland and as a result of flooding. Debbie was thus the worst cyclone to impact this country since Tracey in 1974, and the third-costliest on record (Figure 9 and Figure 10). In addition to Debbie, a hail-storm in Sydney in February generated ca. \$A500 million of claims.

2. *Hurricane Harvey (August-September)*

Harvey was the first major (Category-3 or stronger) hurricane to reach the U.S. since Wilma in 2005, and it inflicted ca. \$US125 billion of damage (of which ca. \$30 billion was insured) – primarily from extreme rainfall that triggered catastrophic flooding in and around the Houston metropolitan area (the country's 4th-largest). During a four-day period, a "1-in-1,000-year flood event" occurred: many areas received more than 1,000mm (one metre) of rain and the worst-hit received more than 1,500mm. The resulting floods killed at least 80 people (and temporarily displaced up to

¹ "Deaths associated with drought," says NOAA, "are the result of heat waves. (Not all droughts are accompanied by extreme heat waves.)"

500,000), inundated ca. 125,000 homes, ruined at least 1 million vehicles and necessitated more than 17,000 rescues.

3. *Hurricane Irma (August-September)*

Irma was the strongest-ever recorded storm in the open Atlantic. It caused widespread catastrophic damage, particularly in the north-eastern Caribbean and Florida Keys. It was also the most intense hurricane to strike the continental U.S. since Katrina, the first major hurricane to land in Florida since Wilma, and the first Cat-4 to hit that state since Charley in 2004. It killed 66 people and caused approximately \$US65 billion of damage (of which ca. \$30 billion was insured).

4. *Hurricane Maria (September-October)*

Maria is the tenth-strongest Atlantic hurricane on record. It caused extensive damage and numerous fatalities across the north-eastern Caribbean; this damage compounded difficulties in areas that Irma had already devastated. Many people believe that its death toll in Puerto Rico is vastly higher than the government's count (64): unofficial estimates range from 500 to more than 4,500.² Financially, total losses exceed \$90 billion, mostly in Puerto Rico (and still rising, given that the island's electricity grid outside San Juan remains largely unrepaired).

In 2018, too, huge storms have affected millions of Americans. Two are most notable:

1. *Hurricane Florence (September 2018)*

Florence caused severe damage – primarily as a result of flooding in the Carolinas. At its strongest it was a Category-4 hurricane, made landfall (near Wrightsville Beach, NC) as Cat-1 and weakened further as it slowly moved inland. Nonetheless, it packed enough punch to uproot trees and cause power outages affecting 0.5m people throughout the Carolinas. It dumped at least 500mm of rain over widespread areas, and almost one metre on some; it thereby ranks as the wettest tropical cyclone recorded in the Carolinas, and also the 8th-wettest overall in U.S. history. On 17 Sep-

² Widespread destruction of communications hampered efforts to document loss of life. CNN's investigation of 112 funeral homes – covering approximately half of the island – estimated that 499 hurricane-related deaths occurred between September 20 and October 19. "Funeral homes became so overwhelmed by the number of bodies that in one instance a facility's director ... died from a stress-induced heart attack" (see [After CNN Investigation, Puerto Rico Asks Funeral Homes to Help Identify Hurricane Deaths](#), 17 November 2017). [Mortality in Puerto Rico after Hurricane Maria](#), a study conducted by researchers at Harvard University and published in the *New England Journal of Medicine*, estimates that 4,645 deaths can be attributed to Maria and its immediate aftermath (see also [Harvard Study Estimates Thousands Died in Puerto Rico because of Hurricane Maria](#), *The Washington Post*, 29 May 2018).

tember, Moody's, the credit ratings agency, estimated that it caused at least \$17-\$22 billion of damage.

2. *Hurricane Michael (October 2018)*

Michael was the third most intense (in terms of atmospheric pressure) Atlantic hurricane that landed in the U.S.: only the Labor Day Hurricane (1935) and Hurricane Camille (1969) were more intense. Michael was the strongest storm (maximum wind speed of ca. 250 kilometres per hour) that hit the U.S. since Andrew (1992), and the fourth-strongest in U.S. history; it was also the strongest to strike the Florida Panhandle. By October 22, Michael had caused at least 54 deaths: 39 in the U.S. and 15 in Central America. Insured losses in the U.S. have been estimated at ca. \$8-11 billion; losses to agriculture and timber in Georgia alone exceed ca. \$3.7 billion.³

How Are Elites Interpreting These Events?

According to prominent people and influential organisations, the fact that three of the financially costliest natural disasters occurred in 2017 can mean only one thing. Moody's, for example, entertains no doubt. "Climate change is forecast to heighten U.S. exposure to economic loss," [it warned on 17 November 2017](#):

Extreme weather patterns exacerbated by changing climate trends include higher rates of coastal storm damage, more frequent droughts, and severe heat waves ... [Our] report differentiates between climate trends, which are a longer-term shift in the climate over several decades, versus climate shock, defined as extreme weather events like natural disasters, floods, and droughts which are exacerbated by climate trends ... One example of climate shock driving [credit] rating change was when Hurricane Katrina struck the City of New Orleans ...

On 1 March 2018, in [QBE under Pressure to Disclose Climate Risks](#), *The Australian Financial Review* reported:

A Sydney-based superannuation fund has lodged resolutions against QBE Insurance Group in an attempt to force the company to disclose more information about climate risk ... "As the physical impacts of climate change are already impacting the insurance industry, QBE should produce and disclose analyses of the material impact of physical risk to its business in

³ See [Losses from Michael Could Be Close to \\$10 Billion](#) (ABC News, 18 October 2018) and [Michael's Estimated \\$3 Billion hit to Georgia Agriculture](#), *Atlanta Journal-Constitution* (18 October 2018).

scenarios where the Paris Agreement is met, along with scenarios where the 2°C global warming limit is breached,” the resolution says. Market Forces [a “climate-action activist group”] said the lodgement marked “a hardening of investor attitudes towards companies failing to effectively manage climate risk ... That [QBE] still fails to recognise climate change as a material business risk is an oversight bordering on negligence,” said a Market Forces analyst who is a former employee of QBE (see also [Super Fund REST Being Sued for not Having a Plan for Climate Change](#), ABC News, 25 July).

The Greens are even more adamant. In “‘Climate Change to Blame’ for Natural Disasters,” *The Australian* (19 March 2018) reported:

The Greens have blamed the federal government’s failure to address climate change for a cyclone and bushfires which have ravaged communities across Australia over the past 48 hours. Cyclone Marcus has swept across the NT, bringing down power lines and hundreds of trees in what Chief Minister Michael Gunner described as the biggest storm to hit the Top End in 30 years [it caused ca. \$A100m of damage]. In Tathra on the NSW South Coast, at least 70 properties have been destroyed, while thousands of hectares of farmland, livestock and 18 homes have been lost in four blazes which were started by lightning strikes across South West Victoria.

In an anti-coal speech in the Senate today, Greens leader Richard Di Natale said ... “We are seeing climate change in our everyday lives ... Right now we would normally be talking about the end of the bushfire season, and yet, here we are with bushfires ravaging my home state and indeed my community.” South Australian Greens senator Sarah Hanson Young said bushfires were getting more severe and frequent, “as a result of climate change ... There is extraordinary changes [sic] going on in our climate ... we know the science has been telling us this for a long time, more and more extreme weather events, more severe and more frequent, is a result of climate change, and it’s one of the key reasons why we can’t take our foot off the pedal when it comes to reducing carbon emissions, reducing pollution, and that means, here in Australia, getting out of exporting more and more coal to the rest of the world, which is only going to make climate change worse.”

Large numbers of academics emphatically concur. Howard Kunreuther of the Wharton Risk Management and Decision Processes Center at the University of Pennsylvania is but one example: “it’s very clear that things are ... worse now than they’ve been in the past.” He concedes that greater numbers of natural disasters aren’t nec-

essarily occurring, but insists that they're becoming more intense – “which is one reason we had this very, very large loss in 2017.”⁴

Australian lawyers and regulators have also joined the frenzy. On 19 June, in [ASIC Warns on Climate Risk as Heat Turns on Directors](#), *The Sydney Morning Herald* reported:

An ASIC commissioner has urged company directors to take seriously a leading barrister's opinion that they could face lawsuits for failing to consider risks related to climate change ... John Price said in a speech [yesterday that] directors “would do well” to carefully consider a 2016 legal opinion⁵ ... [whereby] directors not thinking about climate change risks today could be found liable for breaching their duty of care in the future ... It would likely be “only a matter of time” until a director personally faced litigation over their [sic] statutory duty of care relating to climate change.

... Regulators in Australia and internationally are taking a growing interest in the potential for climate change to destabilise financial markets. The Council of Financial Regulators – which includes ASIC, APRA, the Reserve Bank and the federal Treasury – has also created a working group looking at climate risk as it affects the financial system. APRA executive board member Geoff Summerhayes [last year also cited \[legal opinion\] in a speech](#) in which he described climate change as a “material” risk for the financial system. Mr Price highlighted that social and environmental issues were an “acute” concern for some investors, and corporate boards should consider whether they were responding in a way that was consistent with their “social contract.”⁶

⁴ [Here's What 2018 May Bring for Natural Disasters](#) (*Knowledge @Wharton*, 1 February 2018); see also [2017 Was a Terrible Year for Natural Disasters: Is It the New Normal?](#) (*Knowledge @Wharton*, 1 February 2018) and [Climate and Tech Pose the Biggest Risks to Our World in 2018](#) (World Economic Forum, 17 January 2018).

⁵ In November 2016, Noel Hutley SC, president of the Australian Bar Association, stated that “financial risks caused by climate change would be considered by courts to be foreseeable.” Further, it was “likely to be only a matter of time before we see litigation against a director who has failed to perceive, disclose or take steps in relation to a foreseeable climate-related risk that can be demonstrated to have caused harm to a company” (see [Directors Ignore Climate Change Risks at Their Own Peril](#), *The Australian Financial Review*, 4 November 2016).

⁶ See also “Insurers Told to Disclose Climate Risks,” *The Weekend Australian*, 18-19 February 2017 and “APRA to Test Climate Change Stresses,” *The Australian*, 30 November 2017.

“APRA’s Cold Look at Climate Risks” (*The Australian*, 31 July) elaborated:

The prudential regulator is conducting a climate-risk survey of all the institutions it supervises, ahead of an expected ramp-up in scrutiny of one of the key emerging threats to financial-system stability. APRA member Geoff Summerhayes has written to banks, insurers and superannuation funds in the past week or so, saying that the results of the survey would “help assess industry maturity and inform APRA’s approach going forward.” Since February last year, APRA has been adopting a gradual approach to lifting awareness of the risks flowing from climate change. Summerhayes flagged in a landmark speech at the time that, while the risks were broadly recognised, they were often seen as a future or non-financial problem. However, that was no longer the case: the risks [are] “foreseeable, material and actionable now.”

... The trend was made abundantly clear in September last year when Commonwealth Bank was forced to disclose climate risks in its 2017 annual report after world-first court proceedings brought by CBA shareholders ... Summerhayes escalated his softly-softly approach late last year, saying that mounting scientific evidence suggested global warming would contribute to more frequent, more intense and more expensive natural disasters. Insurers would bear the cost, as would banks [and others] ...

Money Morning (4 July) concluded

Climate change is continuing to challenge the insurance industry, as unpredictable weather events and catastrophes increase. The randomness and intensity is extremely complex to price. Additionally, because of ... increased energy consumption, pollution and global greenhouse emissions, insurers are pressured to consider the significant environmental damage and degradation as a future risk on the industry. These issues are creating significant strain and economic risk for the Australian giants (see also “Climate Change Is Forcing the Insurance Industry to Recalculate,” *The Wall Street Journal*, 2 October 2018).

Finally, and most recently,

For the first time Australian company directors have nominated climate change as the number one issue they want the federal government to address in the long term. The Australian Institute of Company Directors' (AICD) biannual Director Sentiment Index ... shows directors are heeding warnings from regulators about the risks of climate change and the fact that they may, in future, be held liable for failing to act.

[According to one Director,] “investor pressure is certainly one of the factors having an impact. Climate change is a real and urgent risk for organisations, businesses, and directors are keen for governments to seriously consider what they’re doing in that space, either by regulation or other mechanisms.” Conversations were being had at the board level, especially for companies with infrastructure in coastal areas where there were higher risks of climate-related events. “Directors get it about climate change. It’s real. The scientists are unequivocal in their advice. And we’re conscious of the need for action” ([Why Australian Company Directors Have Started Caring about Climate Change](#), ABC News, 25 October 2018; see also “Climate the Burning Issue for Directors,” *The Australian*, 25 October).

What Says Warren Buffett?

As the boss and biggest shareholder of Berkshire Hathaway, one of the world’s biggest insurers and reinsurers, he knows plenty and his actions should carry considerable weight. On 3 March 2014 he told CNBC:

The effects of climate change, if any, have not affected the insurance market ... The public has the impression that because there’s been so much talk about climate that events of the last ten years from an insured standpoint ... have been unusual. The answer is they haven’t. If anything, the incidence of hurricanes and tornados in the U.S. has been well below the historical norm ... I love apocalyptic predictions [about climate change and natural disasters] – they will help to increase [insurance and reinsurance] rates.

In his letter to Berkshire Hathaway’s shareholders (28 February 2016), he added:

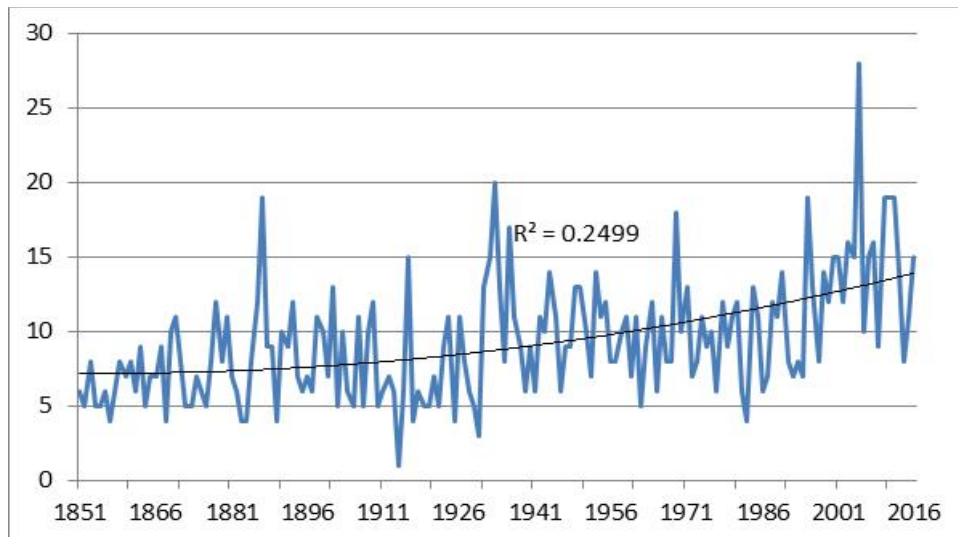
It seems highly likely to me that climate change poses a major problem for the planet. I say “highly likely” rather than “certain” because I have no scientific aptitude and remember well the dire predictions of most “experts” about Y2K. It would be foolish, however, ... to demand 100% proof of huge forthcoming damage to the world if that outcome seemed at all possible and if prompt action had even a small chance of thwarting the danger. ... Up to now, climate change has not produced more frequent nor more costly hurricanes nor other weather-related events covered by insurance. As a consequence, U.S. rates have fallen steadily in recent years, which is why we have backed away from that business. If super-cats become costlier and more frequent, the likely – though far from certain – effect on Berkshire’s insurance business would be to make it larger and more profitable. As a citizen, you may ... find climate change keeping you [awake at night.] As a homeowner in a low-lying area, you may wish to consider mov-

ing. But when you are thinking only as a shareholder of a major insurer, climate change should not be on your list of worries [italics added].

What Say Actual Data?

It's not just astonishing, it's highly suspicious: *the overwhelming majority (perhaps 99%) of the assertions about "climate change" that I've encountered in the mainstream media are just that – assertions.* Virtually never do commentators, journalists and others substantiate their claims – which are often demonstrably incorrect (an example appears on p. 22).

**Figure 3:
Number of Named Storms per Year, Atlantic Ocean
(Including Caribbean Sea and Gulf of Mexico), 1851-2017**



What, then, say valid and reliable data? NOAA has assessed the impact of “greenhouse warming” upon the number and severity of tropical storms.⁷ Figure 3-Figure 6 plot its data. At first glance, records from the start of the 20th century to the present seem to show a slight upward trend; yet the trend is weak and its explanatory power is at best modest (maximum $R^2 = 0.25$). Further, says NOAA,

the density of reporting ship traffic over the Atlantic was relatively sparse during the early decades of this record, such that if storms from the modern era (post-1965) had hypothetically occurred during those earlier decades, a substantial number would likely not have been directly observed by the ship-based observing network.

⁷ See in particular Gabriel Vecchi and Thomas Knutson, [Historical Changes in Atlantic Hurricanes and Tropical Storms](#) (NOAA Geophysical Fluid Dynamics Laboratory, 29 August 2017).

Figure 4:
Number of Hurricanes (Category 1-5) per Year, Atlantic Ocean
(Including Caribbean Sea and Gulf of Mexico), 1851-2017

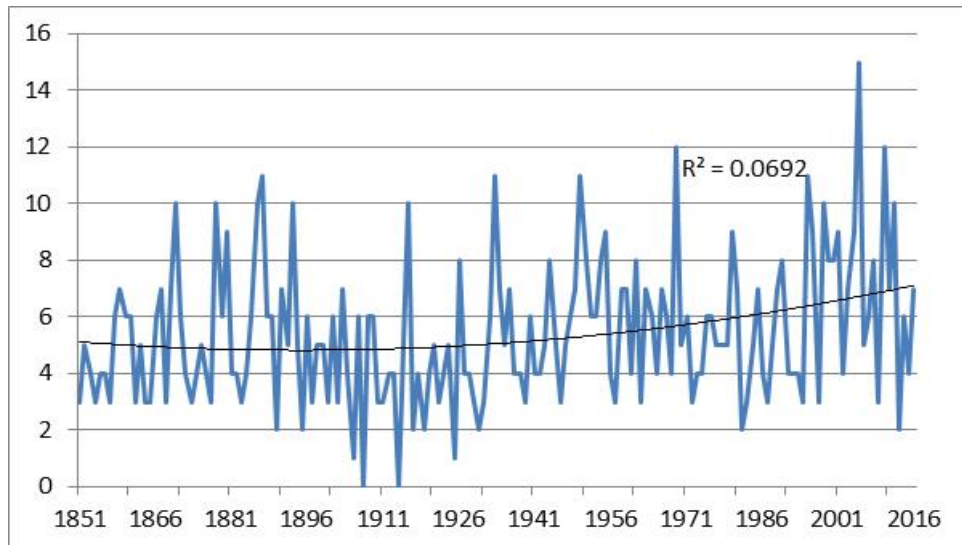
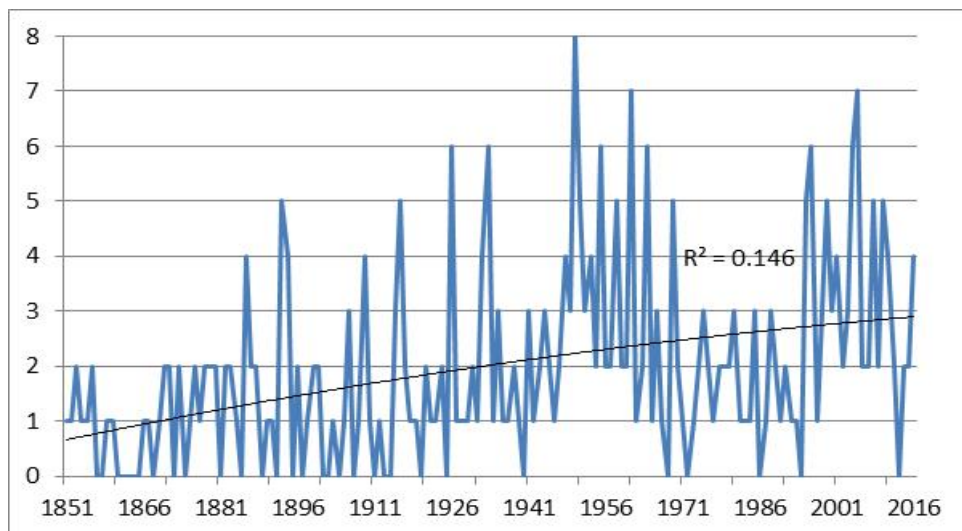


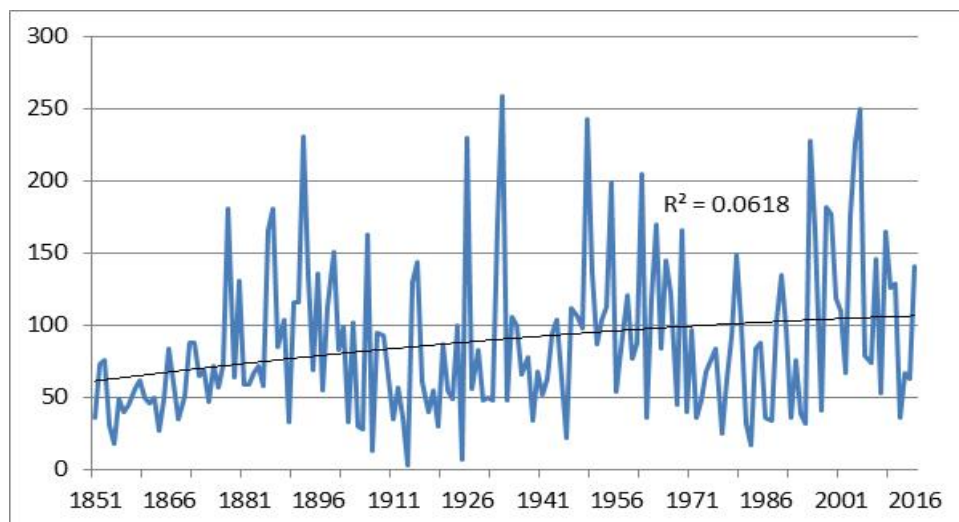
Figure 5:
Number of Major Hurricanes (Category 3-5) per Year, Atlantic Ocean
(Including Caribbean Sea and Gulf of Mexico), 1851-2017



Before the mid-20th century, in other words, air (never mind satellite) reconnaissance didn't exist; accordingly, ships steered clear of hurricane-prone areas during the storm season – and thus failed to detect some storms. *Hence the slight increase of hurricanes since the late-1800s is more apparent than real; specifically, it's primarily a consequence of better monitoring.* Further, finds NOAA, the seemingly-rising incidence of tropical storms in the Atlantic was almost entirely attributable to storms whose duration was less than two days – which, it adds, “were most likely to be overlooked during the earlier part of the record.” Accordingly, “... statistical tests reveal that this

trend is so small, relative to the variability of the series ... [and] not significantly distinguishable from zero.”

Figure 6:
Accumulated Cyclone Energy⁸ per Year, Atlantic Ocean
(Including Caribbean Sea and Gulf of Mexico), 1851-2017



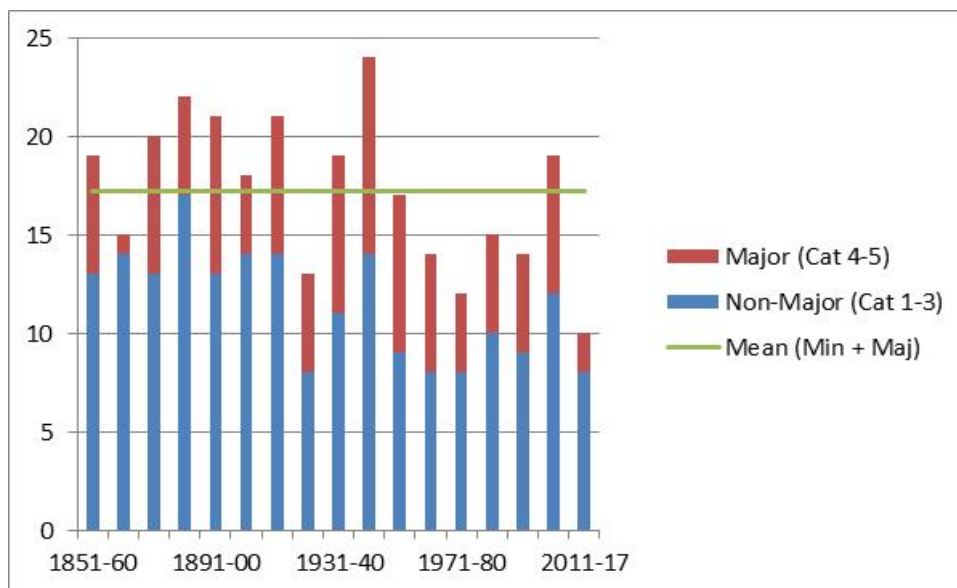
In [An Overview of Current Research Results](#) (24 January 2018), NOAA concluded:

In short, the historical Atlantic hurricane record does not provide compelling evidence for a substantial greenhouse warming-induced long-term increase ... Neither our model projections for the 21st century nor our analysis of trends in Atlantic hurricane and tropical storm counts over the past 120-plus years support the notion that greenhouse gas-induced warming leads to large increases in either tropical storm or overall hurricane numbers in the Atlantic. ... Therefore ... it is premature to conclude that human activity – and particularly greenhouse warming – has already caused a detectable change in Atlantic hurricane activity [italics added].⁹

⁸ According to NOAA, “Accumulated Cyclone Energy” is “an index that combines the numbers of systems, how long they existed and how intense they became. It is calculated by squaring the maximum sustained surface wind in the system every six hours that the cyclone is a Named Storm and summing it up for the season.”

⁹ Caution also applies to other categories of natural disaster. In Europe, for example, the number of and total area destroyed by wildfires has been declining for 40 years, and the incidence and severity of drought and flood hasn’t risen since the 1940s (see “Bad Weather Is No Reason for Climate Alarm,” *The Wall Street Journal*, 12 January 2018 and “Thirty Years On, How Well Do Global Warming Predictions Stand Up?” *The Wall Street Journal*, 21 June 2018). In the U.S., wildfires were far more widespread in the 19th and early-20th centuries than today – and the number

Figure 7:
Hurricanes Striking the U.S., by Category and Decade, 1851-2017



The key measure for insurers and their policyholders isn't the number of hurricanes per se; it's the number of *landfalls*. "Landfalls are important," says Roger Pielke, "because these are the storms that cause almost all [the deaths and damage]." Moreover, one doesn't need modern technology to count them. Figure 7 collates NOAA's count of hurricanes that have struck the U.S. since 1851 (see also [NOAA Technical Memorandum NWS TPC-4](#)). During most decades to 1940, landfalls exceeded the overall mean (15); since then (except in 2001-2010) they've fallen well short. In other words, *although 2017 was a major year, recent years have been below-average*. Indeed, NOAA's analysis concludes that landfalls in the U.S. have shown a slight *negative* trend beginning no later than 1900 and perhaps even in the late-1880s.

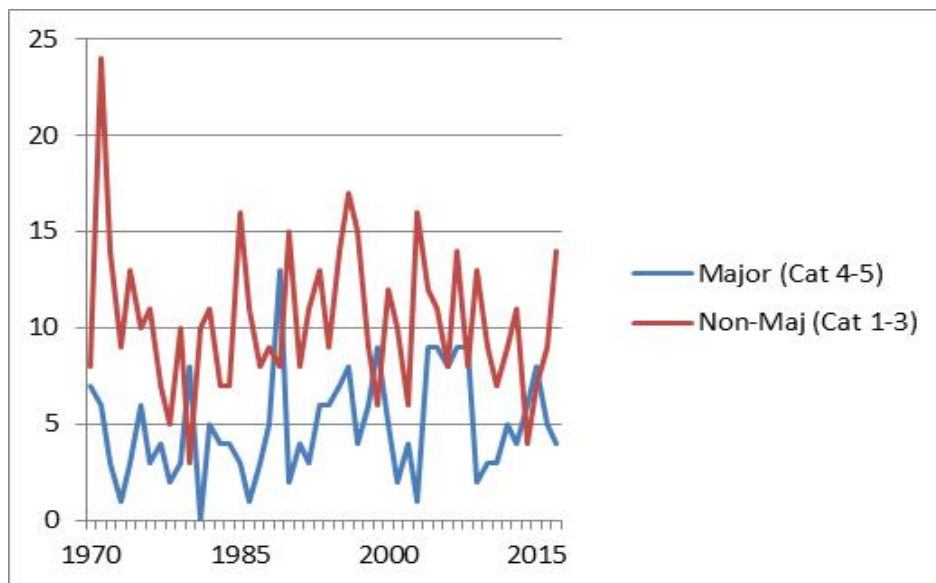
What about the rest of the world? Pielke *et al.*¹⁰ compiled and analysed relevant data (Figure 8). Globally in 2017, 18 tropical cyclones struck land. Four were major; of these, three ravaged the Atlantic. The long-term average is 4.8 (major) and 15.3 (total); 2009-2016 were below-average years; finally, neither series has a trend – and certainly not a significantly-upward one. The UN's *Intergovernmental Panel on Climate Change* (AR5 WG1) agrees. Its Executive Summary states: "confidence remains low for long-term (centennial) changes in tropical cyclone activity." And page 2-60 adds: "current datasets indicate no significant observed trends in global tropical cyclone frequency over the past century." According to *Physics Today* (19 July 2016),

of acres burned then absolutely dwarfs that experienced recently ([Wildfires Got Better Before They Got Worse](#), *Bloomberg Business*, 21 August 2018).

¹⁰ See R. Pielke, et al., [Historical Tropical Cyclone Landfalls](#), *Journal of Climate*, vol. 25 (2012), pp. 4729-4735.

the IPCC's take largely matches that of the World Meteorological Organization, which a decade ago formed an expert team to conduct research and assess the relationships between tropical cyclones and climate change. The resulting document predicted that by the late 21st century the number of tropical cyclones will decrease 6-34% globally, while the mean strength of tropical cyclones will increase 2-11% ... The WMO panel did not find dramatic changes in tropical cyclone tracks, duration, or areas of impact.

Figure 8:
Global Tropical Cyclone Landfalls at Hurricane Strength,
by Category, 1970-2017



What about Australia? Figure 9 and Figure 10 plot its ten costliest – measured in constant \$A – natural disasters (see [Australia's Worst Cyclones since 1970](#), ABC News, 9 February 2016). *As time has passed, they've clearly wreaked LESS damage.*¹¹ By a wide margin, Tracey – a Category-5 monster which killed 71, injured 3,000 and levelled Darwin in 1974 – remains the costliest. Ada, a Cat-4 which killed 14 people when it struck the Whitsundays in 1970, ranks second. Larry, a Cat-4 that landed

¹¹ Valid and reliable estimates of damage don't exist before 1970. According to [Australia's Most Destructive Cyclones: a Timeline](#) (*Australian Geographic*, 23 February 2016), "Cyclone Mahina may have claimed more than 400 lives when it struck Princess Charlotte Bay on Cape York Peninsula, in March 1899, making it Australia's deadliest natural disaster." Another Cat-5, the unnamed Innisfail cyclone of 1918, destroyed all but a dozen houses in this town of 3,500. "It's thought 37 people died in the town and possibly another 60 in surrounding areas." Another unnamed (Cat 4-5) cyclone struck Mackay in 1918: "about 30 people died as a result. ... It took residents five days to successfully send word out to signal the alarm and tell the rest of Australia what had happened." Fortunately, no major cyclone affected Australia until the Cat-3 "Great Gold Coast Cyclone" of 1954. It caused widespread damage from Noosa to Brisbane, the Gold Coast, Byron Bay and Lismore, and killed at least 26 people.

near Innisfail in 2006, fortunately caused no deaths or serious injuries; it did, however, damage 10,000 homes and devastated crops across Far North Queensland.

Figure 9:
Australia's Ten Most Destructive Cyclones since 1970,
Billions of Constant (2018) \$A, in Chronological Order

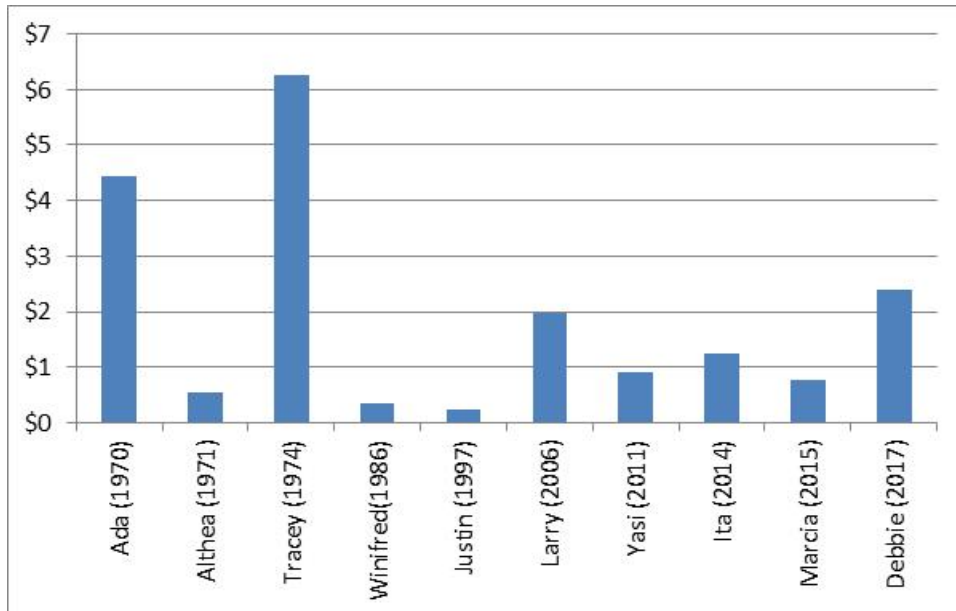
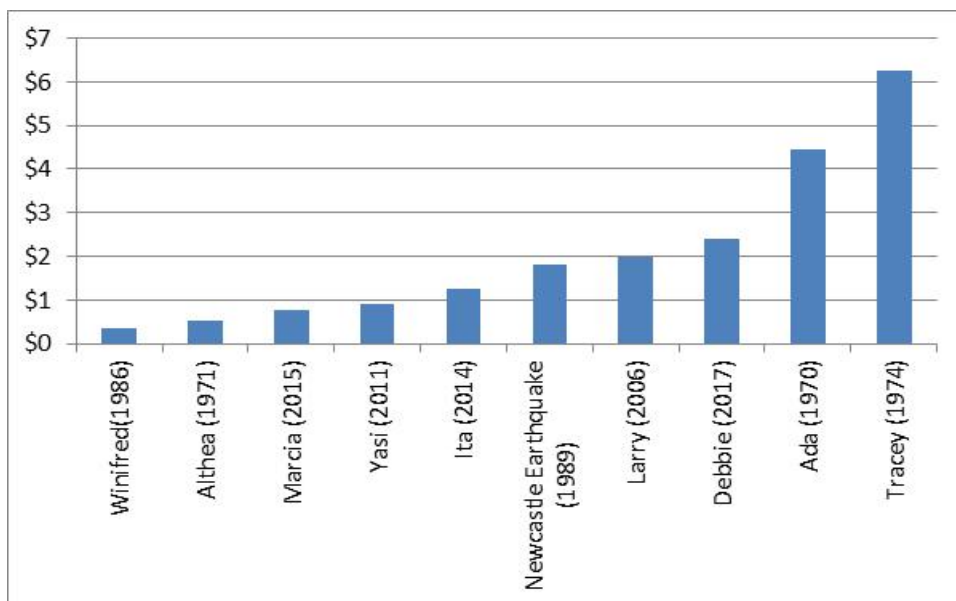


Figure 10:
Australia's Ten Costliest Natural Disasters since 1970,
Billions of Constant (2018) \$A, Ranked According to Cost



What about fatalities? Whether in the Atlantic, the Caribbean or globally, historical data disprove the allegation that cyclones, hurricanes, typhoons and the like are

deadlier now than they were in the past: the data in Table 2 show no trend ($R^2 = 0.04$) and those in Table 3 trend downwards ($R^2 = 0.31$).

Table 2:
The 10-Deadliest Known Atlantic Storms (Ranked by Fatalities)

Rank	Name	Area/Country Affected	Year	Est'd Deaths
1	Great Hurricane	Lesser Antilles	1780	22,000+
2	Mitch	Honduras, Nicaragua, Yucatán Peninsula	1998	11,500-18,000
3	Galveston	Texas	1900	8,000-12,000
4	Fifi	Caribbean, Central America	1974	8,000-10,000
5	Flora	Caribbean	1963	7,185-8,000
6	Dominican Republic	Greater Antilles, Florida	1930	2,000-8,000
7	Pointe-à-Pitre	Lesser Antilles	1776	6,000+
8	Newfoundland	British America	1775	4,000-4,150
9	Okeechobee	Caribbean, U.S. East Coast, Atlantic Canada	1928	4,075+
10	Monterrey	Caribbean, Mexico, Texas	1909	ca. 4,000

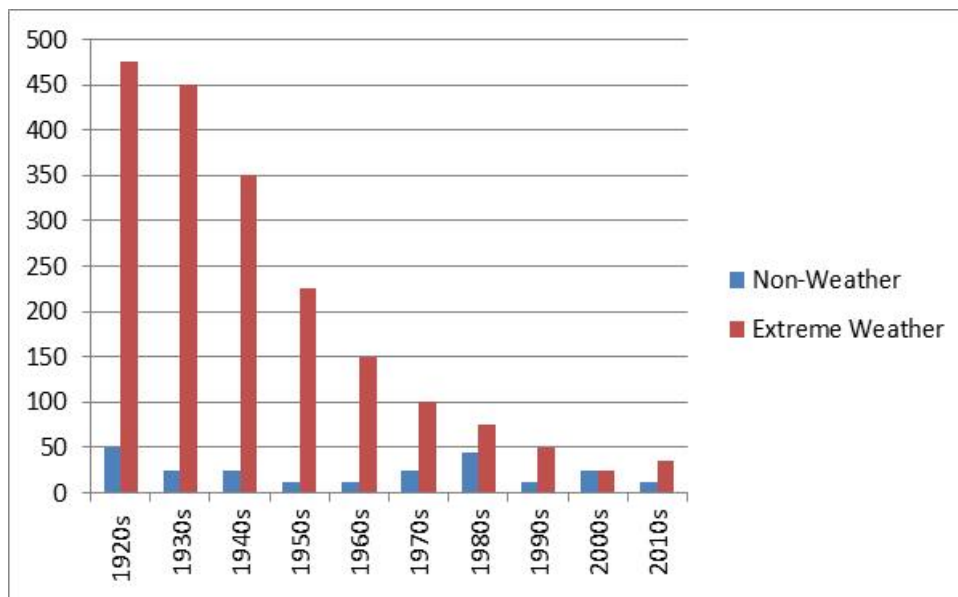
Table 3:
The 10-Deadliest Known Global Storms (Ranked by Fatalities)

Rank	Name	Country Affected	Year	Est'd Deaths
1	Great Bhola Cyclone	Bangladesh	1970	300,000-500,000
2	Hooghly River Cyclone	Bangladesh and India	1737	325,000
3	Haiphong Typhoon	Vietnam	1881	300,000
4	Cyclone Coringa	India	1839	300,000
5	Backerganj Cyclone	Bangladesh	1584	200,000
6	Great Backerganj Cyclone	Bangladesh	1876	200,000
7	Chittagong Cyclone	Bangladesh	1897	175,000
8	Super Typhoon Nina	China	1975	171,000
9	Cyclone 02B	Bangladesh	1991	150,000
10	Cyclone Nargis	Myanmar	2008	140,000

Indeed, the best news by far is that, around the world over the past century, natural disasters of all kinds have killed ever fewer people; further, fatalities from the deadliest category of disaster have decreased fastest. In Figure 11, "Non-Weather" means earthquakes, tsunamis

and eruptions of volcanos; “Extreme Weather” means droughts, extreme temperatures, floods, storms and wildfires. On average during the 1920s, extreme weather killed an estimated 475,000 people around the world per year. In every successive decade, this number has fallen; by 2010-2017, the annual average had plummeted to 35,000. Similarly, but much less dramatically, deaths from earthquakes, etc., decreased from ca. 50,000 per year in the 1950s to 12,500 per year in 2010-2017.

Figure 11:
Total Global Deaths by Category of Natural Disaster,
Annual Average (Thousands) per Decade, 1920-2017



As Bjørn Lomborg¹² wrote on his blog (15 March 2018),

This is clearly opposite of what you normally hear, but that is because we’re often just being told ... how *many* events are happening. The number of reported events is increasing, but that is mainly due to better reporting, lower thresholds and better accessibility (the “CNN effect”). Instead, look at the number of dead per year, which is much harder to fudge. Given that these numbers fluctuate enormously from year to year (especially in the past, with huge droughts and floods in China), they are here presented as averages of each decade (1920-29, 1930-39 etc., with last decade as 2010-17). The data [are] from the most respected global database, [the International Disaster Database](#). There is some uncertainty about complete

¹² Lomborg is President of the Copenhagen Consensus Centre. CCC is a conference of prominent economists, held every four years, which uses cost-benefit analysis to examine, prioritise and formulate potential solutions to global issues. He was formerly the director of the Danish government’s Environmental Assessment Institute.

reporting from early decades, which is why this graph starts in 1920, and if anything this uncertainty means the graph *underestimates* the reduction in deaths [italics in original].

Roger Pielke (“Some Good News – About Natural Disasters, of All Things,” *The Wall Street Journal*, 3 August 2018) agrees:

In his posthumously published book *Factfulness: Ten Reasons We’re Wrong About the World – and Why Things Are Better Than You Think* (Flatiron, 2018) the Swedish statistician Hans Rosling describes a paradox: “The image of a dangerous world has never been broadcast more effectively than it is now, while the world has never been less violent and more safe.” A case in point: natural disasters. The earth will always be volatile, but despite recent fires, volcanoes and hurricanes, humanity currently is experiencing a stretch of good fortune when it comes to disasters ... It’s deceptive to track [them] primarily in terms of aggregate cost. Since 1990, the global population has increased by more than 2.2 billion, and the global economy has more than doubled in size. This means more lives and wealth are at risk with each successive disaster.

[Yet] disasters are claiming fewer lives ... The material cost of disasters also has decreased when considered as a proportion of the global economy. Since 1990, economic losses from disasters have decreased by about 20% as a proportion of world-wide gross domestic product. The trend still holds when the measurement is narrowed to weather-related disasters, which decreased similarly as a share of global GDP even as the dollar cost of disasters increased. The decrease in disaster damage isn’t a surprise, because as the world population and economy have grown, the incidence of the most damaging extreme events has hardly changed. The Intergovernmental Panel on Climate Change reported in 2014 that there has been no increase in hurricanes, floods, droughts or tornadoes within the past 30 years. And 2018 is on track to have the lowest losses from disasters as a share of global GDP since 1990.

... Improving resilience to disasters will be easier if it is based on evidence. That means acknowledging both the progress made so far and the risks and vulnerabilities that lie ahead. As Rosling advises: “factfulness, like a healthy diet and regular exercise, can and should become part of your daily life ... You will make better decisions, stay alert to real dangers and possibilities, and avoid being constantly stressed about the wrong things.”

Forget “Climate Change” – Here’s a Genuine Risk

Recall from Figure 2 that, of the world’s five costliest natural disasters since 1970, two are earthquakes. The seismic scale and geographical scope of the tremor and fire that destroyed half of San Francisco on 18 April 1906 remind us that, if and when such a disaster recurs (seismologists regard it as very likely; see below), its human and financial cost will probably greatly exceed those of hurricanes such as Katrina and Andrew. Killing an estimated 3,000 people, the San Francisco quake and fire remains the second-worst natural disaster in American history: only the unnamed hurricane that smashed Galveston, Texas on 8 September 1900 and killed an estimated 8,000-12,000 people exceeds it, and it triggered the largest by far (bar none including Katrina) relief effort in U.S. history.

In the earthquake’s wake, severe strains reverberated through the global financial system. On the New York and London stock exchanges, news of the disaster in San Francisco caused initial (ca. 15%) sell-offs that, according to some, triggered a sequence of events that culminated in the Panic of 1907. Insurers faced claims equivalent to the cumulative profit of the entire American insurance industry since 1860. At least 150 and as many as 220 insurers (not just in the U.S. but also in Britain and Europe) were directly involved, and another 17 provided reinsurance. The claims severely strained all insurers’ finances; as a result, only six fully honoured their obligations, and 20 collapsed (see Robert Bruner and Sean Carr, *The Panic of 1907: Lessons Learned from the Market’s Perfect Storm*, John Wiley & Sons, 2009).

A series of studies conducted by academics at Stanford University in 1996 concluded: “if the worst possible earthquakes struck San Francisco, Los Angeles or Tokyo, economic losses would be substantially higher than previously estimated ... In the two U.S. cities, loss of life would also be greater than earlier estimates.” According to these studies:

- “A repeat of the 8.3 magnitude 1906 earthquake in the San Francisco Bay Area could result in 3,000-8,000 deaths, 8,000-18,000 serious injuries, and a total economic loss of \$340-\$450 billion [recalculated in 2018 \$US];
- A magnitude 7.0 temblor ... in the Los Angeles basin could result in 3,000-8,000 deaths, 11,000-20,000 hospitalizations and a total economic loss of \$350-\$440 billion;
- Re-occurrence of the ... Great Kanto Earthquake, which destroyed Tokyo in 1923 [see Table 4] ... could result in 30,000-60,000 deaths, 80,000-120,000 serious injuries and economic losses totalling between \$4.2 and \$6.6 trillion.”¹³

¹³ This point also applies to Australia: according to *The Newcastle Herald* (3 March 2016), an earthquake like the one that occurred in 1989 “would cost \$A18.7 billion.”

- “... These estimates represent worst-case scenarios. They assume that the largest earthquakes considered likely to occur in the next 30 to 50 years would strike as close as possible to the most highly developed areas in the three locations” (Stanford News Service, [Casualty, Damage Estimates of Great Quakes Revised Upward](#), 1 October 1996).

According to the U.S. Geological Survey, the threat of another major quake in the San Francisco Bay Area is “real and could happen at any time.” Specifically, the odds are 3-in-4 that within the next 30 years it will experience an earthquake of magnitude 7.2 or greater. The risk is hardly confined to the Bay Area. USGS’s latest Uniform California Earthquake Rupture Forecast (UCERF3) estimates that the probability is 93% that a quake of magnitude 7.0 or larger will hit the Golden State by 2045; even higher probabilities occur along the San Andreas Fault in Greater Los Angeles.¹⁴ Finally, note that the worst – as measured by geological severity – earthquake in Japanese history occurred less than a decade ago; ranked by number of fatalities, it was the sixth-worst in that country’s history (Table 4; see also Figure 2).

**Table 4:
The Ten Worst Earthquakes in Japanese History**

Date	Richter Scale	Est’d Deaths
Sep 1923	8.3	140,000
Sep 1498	8.6	31,000
May 1293	7.3	23,000
Jun 1896	8.5	22,000+
Mar 2011	9.1	16,000
May 1792	6.4	15,500
Apr 1771	7.4	13,500
Dec 1854	8.4	10,000+
May 1847	7.3	8,600+
Oct 1891	8.0	7,300

In the 1990s, It Was Dot Coms and Y2K; Today, It’s “Climate Change”

Are We Supposed to Laugh or Cry?

What do today’s corporate bureaucrats do when hard numbers indicate that their achievements are meagre? Babble soft buzzwords about their unimpeachably good intentions! “Corporate Australia is starting to get serious about its public support for

¹⁴ See [USGS Fact Sheet 2018-3016](#), April 2018; [East Bay Fault Is ‘Tectonic Time Bomb,’ More Dangerous than San Andreas, New Study Finds](#), *The Los Angeles Times*, 17 April 2018; and [USGS Fact Sheet 2015-3009](#), March 2015.

action on climate change,” alleged *The Weekend Australian* (“Climate’s Right for Corporate Change: IAG”) on 27-28 October 2018,

with Insurance Australia Group yesterday announcing direct accountability for executives to deliver on its plan to mitigate climate risk ... IAG said [at its AGM in Sydney yesterday that] it would include climate measures in setting performance goals and short-term incentives for its senior executives ... IAG chief executive Peter Harmer said the company’s primary concern was the Paris Agreement to limit global climate change to well below 2C of global warming below pre-industrial levels. “We are feeling the effects of climate change already. We see it in our own industry’s data, which tells us an inescapable truth,” Mr Harmer told shareholders. “In recent years we have seen an increase in the frequency of severe weather events that are affecting greater and greater numbers of people [no, we haven’t; see above]. And we know climate change impacts will increase even further [no, we don’t; see below] ... Taking action on climate change and its impacts makes sense for our business and for our communities.”

What “actions on climate change” will IAG undertake? “The IAG climate plan includes five key areas including advocacy and relationships, staff training, company-wide emissions reduction, investment policy and product design.” In plain English, IAG’s executives will utter politically-correct drivel, train staff to parrot politically-correct drivel – and, perhaps, change light globes, install solar panels and sell their shares of oil companies. What about senior executives’ bonuses? The phrase “short-term incentives” gives the game away. Will their pay depend upon the success of their efforts to “limit global climate change to well below 2C of global warming below pre-industrial levels”? You’ve *got* to be joking! “A spokesman said [IAG] was not able to quantify the impact of climate change on claims or to modify policies based on them.” In other words, the remuneration of IAG’s senior executives won’t reflect *outcomes* (cold facts of success) but rather *inputs* (hot air about aspirations).

What is Science, Anyway?

According to [Sir Karl Popper](#) (1902-1994), science is the process of enquiry whereby scientists attempt to refute theories, i.e., logically-related sets of statements from which they’ve deduced testable hypotheses. Sir Karl contended that theories are necessarily abstract; accordingly, they can be tested only indirectly – namely by reference to their logical and empirical implications. No number of positive experimental tests (confirmations) can confirm a theory, but a single counter-example (falsification) can disconfirm it. Accordingly, an hypothesis which logic or evidence contradicts is probably false; however, those that rigorous tests repeatedly fail to falsify might be true. To say that an hypothesis is “falsifiable” doesn’t mean that it’s untrue: it means that if it’s false then in principle it can be shown to be so. Falsifiability is the

core of Popper's philosophy of science. It's the criterion by which Popperians demarcate between what is and isn't science: a theory is scientific only if hypotheses derived from it are falsifiable. On this basis Popper concluded that Marxism, psychoanalysis, etc., aren't sciences. As Popper perceived it, science is fundamentally conjectural and subject to revision; and because any scientist can never be certain about her conclusions, she must always be humble.¹⁵

Today's Crisis of Science – and Particularly of “Climate Science”

Is the typical climate scientist actually a scientist? Clearly, most of today's “climate scientists” disavow Popper.¹⁶ They're not dispassionate – never mind sceptical – towards (and hence don't strive to *reject*) the theories and hypotheses they devise; instead, they zealously embrace and thus seek to *confirm* them – not least by suppressing instances of disconfirmation, and shunning and even vilifying sceptics. I'm not saying (because I'm not competent to judge) that climate scientists as a whole are mistaken.¹⁷ *But I strongly suspect that, by forsaking Popper, they overstate their case; that is, they greatly understate the uncertainty that surrounds global warming.* Clearly, tropical storms are NOT more numerous and severe now than they were in the past. Equally evidently, supporters downplay, deny or ignore vital facts: in particular, during the past century the number of fatalities from natural disasters has drastically shrunk. In other words, over time people have adapted ever better to the risk of natural disaster; why shouldn't this welcome trend continue?

Of course, “climate scientists” are hardly the only ones prone to hyperbole. Their and their fellow-travellers' vehemence – and intolerance of sceptics! – recalls admirers of the Efficient Market Hypothesis since the 1970s, Y2K zealots in the late-1990s, fanatics of the “New Economy” during the Dot Com Bubble and arrogant (and utterly blind!) central bankers and mainstream economists before the GFC. As Robert Murphy notes ([Economic and Climate Models](#), *Mises Wire*, 14 October 2008),

The “rigorous,” peer-reviewed Keynesian economic models reached the zenith of their professional success in the 1950s and 1960s, and yet, in retrospect, many economists would now admit that they were fundamentally flawed and provided horrible policy recommendations. Despite the obvi-

¹⁵ See in particular *The Logic of Scientific Discovery* (1934, English translation 1959) and *Conjectures and Refutations: The Growth of Scientific Knowledge* (1963).

¹⁶ See, for example, Don Aitkin, [Karl Popper on “Climate Change”](#) (15 February 2016).

¹⁷ It's hardly necessary to mention, however, that the assumption underlying their central policy recommendation – namely that concerted and determined intervention by the world's governments can change the global climate – is beyond laughable.

ous differences between the disciplines, this sorry episode from the field of economics should counsel caution before we hand over even more power to the politicians due to the results of mainstream climate models.

*The Achilles heel of “climate science” is that many of its advocates aren't dispassionate seekers of truth; nor are they exempt from institutional and personal temptations. Quite the contrary: they're often fervently avaricious partisans.*¹⁸ Not a few have succumbed to [crony environmentalism](#); accordingly, we should regard them as agitators and propagandists. In *The Poverty of Historicism* (1957), Sir Karl anticipated their mindset:

The discovery of instances which confirm a theory means very little if we have not tried, and failed, to discover refutations. For if we are uncritical we shall always find what we want: we shall look for, and find, confirmation, and we shall look away from, and not see, whatever might be dangerous to our pet theories. In this way it is only too easy to obtain what appears to be overwhelming evidence in favour of a theory which, if approached critically, would have been refuted.

Few people can distinguish Popperian from anti-Popperian science. Hence most are oblivious to today's [crisis of science](#). In [Faith in Science Is Undermined by Peer-Review Failings](#) (*The Weekend Australian*, 20-21 October 2018), Judith Sloan writes

The trouble for the IPCC – and for many other outlets that carry scientific findings – is that a crisis in science has been brewing for some time ... The fundamental problem is that the results of many peer-reviewed papers and reports have not been confirmed when the experiments have been repeated or the data reanalysed. Eminent medical scientist John Ioannidis belled the cat as early as 2005 in a much cited technical paper, [Why Most Published Research Findings are False](#).

He concluded that “there is increasing concern that most current published research findings are false ... *For many current scientific fields, claimed research findings may often be simply accurate measures of the prevailing bias.*” ... There is a variety of reasons for the failure of studies to be replicated. At one end of the spectrum is fraud and misconduct, while at the other end is manipulation and cherry-picking of data. *Researchers have strong incentives to establish significant results while discarding inconvenient data ...* Authors often make it deliberately difficult for other researchers to re-do

¹⁸ See Peter Klein, [Incentives, Ideology, and Climate Change](#) (*Mises Wire*, 2 December 2015) and Curtis Williams, [Rothbard Explains the Proper Response to Climate Change](#) (*Mises Wire*, 9 March 2017).

experiments or check findings. Additionally, many referees ... do a lousy job by simply reading papers and approving them if they [like] their findings [italics added].

Like “Sovietologists” of yesteryear, today’s “climate scientists” are in effect government employees. The problem isn’t merely that they possess a strong incentive to please their master; [over time he’s become ever less trustworthy](#). Accordingly, his minions, too, are less truthful: they exaggerate some conclusions (the Soviet threat then; the climate threat now) and suppress others ([Communism was doomed to collapse](#); mankind can adapt to changes of climate). The unexpected – to alleged experts! – collapse of the USSR was great for humanity but catastrophic for Sovietologists. From the point of view of their jobs and status, it behoved them – and today butters the bread of “climate scientists” – to overstate and even scaremonger. This is because, as Lomborg ([The Sky Is Not Falling](#), *Project Syndicate*, 23 April 2018) notes,

Humans are partial to bad news. Media outlets reflect and shape this preference, feeding us woe and panic. Long, slow, positive trends don’t make it to the front page or to water-cooler conversations. So we develop peculiar misperceptions, especially the idea that a preponderance of things are going wrong. When I published *The Skeptical Environmentalist* in 2001, I pointed out that the world was getting better in many respects. Back then, this was viewed as heresy, as it punctured several common and cherished misperceptions, such as the idea that natural resources were running out, that an ever-growing population was leaving less to eat, and that air and water were becoming ever-more polluted. In each case, careful examination of the data established that the gloomy scenarios prevailing at the time were exaggerated.

Will “Climate Science” Go the Way of EMH?

Since the 1970s, if not before, the [Efficient Market Hypothesis](#) (EMH) has been the central concept of financial economics. Its dominance – as well as that of its cognate theories, the Capital-Asset Pricing Model and Modern Portfolio Theory – has hardly been restricted to academia: “in recent decades,” writes David Dreman (*Contrarian Investment Strategies: The Psychological Edge*, Free Press, 2011, p. 87), EMH “leaped out of academia and became the farthest-reaching and most widely followed theory in the [real] world of global finance.” EMH so pervades academia and Wall Street – and, unwittingly, Main Street – that Michael Jensen, one of the important contributors to its development, famously declared that “It’s dangerously close to the point where no graduate student would dare send off a paper criticising [it]” (see Carol Loomis, [Can You Beat the Stock Market?](#) *Fortune*, 26 December 1983). Does that mentality remind you of today’s skills of “climate change”?

For the past decade, however, it's not been controversial to state the obvious – this massive edifice has always rested upon flimsy foundations. The repeated occurrence of events which its adherents regard as impossible (such as the illiquidity of portfolio hedges on [Black Monday](#) in 1987) caused it to totter, and the Global Financial Crisis weakened it to near-collapse. “By 2007–2009,” Laurence Siegel concludes, “you had to be a fanatic to believe in the literal truth of the EMH.”¹⁹ Its critics had long claimed that its underlying assumptions (i.e., liquidity is always ample, leverage is irrelevant, volatility remains stable over time, “risk” and “volatility” are synonymous, all market participants’ time horizons are identical, etc.) are not merely false: they’re absurd. Critics also demonstrated that some of the mainstream’s most fundamental contentions (e.g., volatility and returns are highly correlated; hence actors in markets can obtain higher returns only by incurring greater risk) are simply incorrect.²⁰ Yet its evident failure in the real world somehow doesn’t matter: “EMH still flourishes,” says Dreman (2011, p. 87), “followed [usually unwittingly] by enormous numbers of investors on their own or through the managers of their mutual funds and investment advisers.”

What, ultimately, does EMH contend? According to Eugene Fama, its principal architect, “I take the market efficiency hypothesis to be the simple statement that security prices fully reflect all available information.” Investors are always knowledgeable and rational. Further, in their efforts to ascertain the appropriate prices of securities they bring all relevant information to bear (and discard all that’s immaterial); moreover, they do so correctly and quickly. Prices mightn’t always be *right*, but they’re invariably *unbiased*; that is, if they’re wrong then they’re just as likely to be too high as too low. Hence nobody can consistently beat the market over time.

Prices are always sensible, says EMH, because they always reflect rational actors’ estimates of stocks’ true worth. *But which prices – the ones immediately before or those shortly after bubbles burst and prices crash?* EMH’s biggest weakness is glaringly obvious: it ignores or denies the very possibility that market bubbles and manias, and hence panics and crashes, can occur.²¹ Indeed, [Jeremy Grantham](#), [Paul Volcker](#) and

¹⁹ See [Black Swan or Black Turkey? The State of Economic Knowledge and the Crash of 2007-2009](#), *Financial Analysts Journal*, vol. 66, no. 4 (2010), pp. 6–10.

²⁰ For a readable overview, see chaps. 4-6 of Dreman (2011); see also Dreman, *Contrarian Investment Strategies: The Next Generation* (Simon & Schuster, 1998), chaps 3 and 14 and pp. 374-398.

²¹ “The word ‘bubble’ drives me nuts,” Fama declared in 2007 – just months before the GFC’s eruption (quoted in Paul Krugan, “Why Did Economists Get It So Wrong?” *The New York Times*, 9 September 2009). “I don’t even know what a bubble means,” Fama later added. Such words “have become popular. I don’t think they have any meaning” (“Rational Irrationality: Interview with Eugene Fama,” *The New Yorker*, 13 January 2010). He should have asked Charles Kindleberger – his colleague at the University of Chicago. In *Manias, Panics and Crashes: A His-*

others have contended that EMH's utter blindness helped to cause the Global Financial Crisis.²² If EMH is correct, then, as Dreman (2011, p. 101) notes,

How could the 1996-2002 and 2003-2009 bubbles [and subsequent] crashes, two of the most severe in economic history, occur within only a few years of each other ...? ... The truth is that the work of academics, including several ... Nobel laureates [such as Fama] whose research is the bedrock supporting EMH ..., has caused heretofore unheard-of market damage in numerous bubbles during the past twenty-five years ...

"Despite this massive failure of EMH," Dreman (2011, p. 123) adds in reference to the collapse of [Long-Term Capital Management](#) (whose multi-billion bailout by 16 major banks in 1998 required the supervision of the U.S. Federal Reserve),

neither of the two Nobel laureates who had championed the fund's strategy questioned [EMH]. Although [one] admitted that the fund's risk measurements hadn't worked, he stated that the principles it had followed were right. What was needed, he argued, was more sophisticated modeling. [After LTCM's collapse] went back to teaching at Harvard and, perhaps ironically, was hired by JPMorgan as a risk consultant.

Are markets efficient? If "all" were removed and "eventually" replaced "fully," Fama's contention would provide a reasonable rule of thumb. Alas, enthusiasts of EMH – like, I suspect, partisans of "climate change" – greatly overstate their case. Clearly, some investors are knowledgeable and rational; others, however, are ignorant and crazy (and most confuse facts and opinions). Prices of securities do indeed reflect available information. Investors eventually utilise most of the relevant and true information – but usually incorporate false and extraneous material into their decisions. Above all, most market participants are overconfident and their memories are short; as a result, they often fail to learn from (and thus repeat) mistakes. *Over time, then, prices tend towards efficiency – but at any given point, and indeed over significant stretches, they can be nonsensical: most notably, during booms they're irrationally high and during busts they're unreasonably low.* Accordingly, and as Warren Buffett showed in [The Superinvestors of Graham and Doddsville](#) (a speech delivered at Columbia Business School in 1984), given the right tools and mindset it's possible – but hardly easy, such that few manage to do it – to beat the market. Buffett shrewdly

tory of Financial Crises (John Wiley, 2005) Kindleberger writes (p.1): "The years since the early 1970s are unprecedented in terms of ... the frequency and severity of financial crises ... and bubbles."

²² See Joe Nocera, [Poking Holes in a Theory on Markets](#), *The New York Times* (5 June 2009) and Paul Volcker, [Financial Reform: Unfinished Business](#), *The New York Review of Books* (27 October 2011).

noted: “Observing correctly that the market was *frequently* efficient, [fanatics of EMH] went on to conclude incorrectly that it was *always* efficient. The difference between the two is night and day.”²³

EMH was once widely regarded as invincible; today, though many pay it lip service relatively few retain this view. Will “climate science” suffer a similar fate? My hunch is that, as time passes, they will increasingly share two glaring – and embarrassing – similarities. Adherents will

1. laud themselves as exemplars of “science” and denounce sceptics and critics as “anti-science” – despite the fact that adherents are largely anti-Popperian (and thus, in Popperian terms, pseudo-scientists).²⁴
2. ignore the fact that some of their central claims have been disproved – and take refuge in ever more arcane theories and unfalsifiable assertions.

Public Self-righteousness Cloaks Base Private Motives

“Climate science” is the latest warm phrase that conceals cold selfishness. Under its cover, academics chase grants, tenure and other sinecures, lawyers tout litigation, politicians hunt votes, regulators connive to expand their empires – and insurers hanker to raise premiums. Most doggedly pursue *libīdō dominandī*; consequently, they deny or ignore logic and evidence that expose their covetousness. So bless sceptics, for they speak truth to power. As Lomborg concluded ([Wrongheaded in Rio](#), *Project Syndicate*, 13 June 2012): “Global warming [if it exists, and no matter whether it’s natural or manmade] is by no means our main environmental threat.”

Chris Leithner

²³ Quoted in Roger Lowenstein, *Buffett: The Making of an American Capitalist* (Doubleday, 1998), p. 307. Yet it’s important to acknowledge that one of EMH’s central claims seems to be true – and its consequences have been salutary. The random walk hypothesis – which states that that fluctuations of stocks’ day-to-day price and trading volume contain no information that will enable short-term speculators to “outperform” long-term buy-and-hold investors – is more likely to be true than false (for an overview, see Dreman, 2011, pp. 88-93). If so, then “technical analysis” (also known as “charting”) is voodoo. Inexplicably, however, chartists and technicians, like advocates of EMH, continue to flourish.

²⁴ For an examination of aspects of mainstream finance from a Popperian point of view, see Edward Saunders, “Testing the Efficient Market Hypothesis without Assumptions,” *The Journal of Portfolio Management*, vol. 20, no. 4 (Summer 1994), pp. 28-30.