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REGULATION was first published in July 1977 “because the extension of regulation is piecemeal, the sources and targets diverse, the language complex and often opaque, and the volume overwhelming.” REGULATION is devoted to analyzing the implications of government regulatory policy and its effects on our public and private endeavors.

**FOR THE RECORD****Accepting Carden’s Challenge**

In his comprehensive review of my book *Greening of Capitalism* (Fall 2016), Art Carden picks up a somewhat casual observation of mine, namely that I am so confident that commodities are going to become subject to worsening shortages as the world industrializes that I would be prepared to bet on their prices rising over the long term. As I put it,

There can be no expectation that the long-term trend in the price of coal (and other minerals) will be anything but upward—and I would be prepared to bet on this with Simon if he were still alive.

Carden steps in and declares himself willing to take up the cudgels on Julian Simon’s behalf, and challenges me to accept a similar bet, as he details in the review. I accept his challenge.

The original wager between Simon and Paul Ehrlich was made in 1980, and turned on the clash between two world views. There was Simon’s belief that endless substitution of one commodity by another would, through the operation of market forces, ensure that commodity prices would decline. Ehrlich’s belief was that population pressures would be so strong that demand for commodities would grow and drive prices up. As we all know, Simon won the bet. But as recent commentators have noted, it all depends on where the start line is taken and over what period the bet is taken. Adam Smith Institute senior fellow Tim Worstall, for example, in a Jan. 13, 2013 column for *Forbes.com*, demonstrates that Ehrlich would have won the bet on several alternative timelines and choices of commodities baskets, particularly in the decade 2000 to 2010. And as *Financial Times* writer Henry Sanderson points out in his August 18, 2013 column, commodity prices overall since 1975 hardly seem to favor Simon over Ehrlich.

I want to make it clear why I am accepting this bet. I am not certain as to Carden’s world view, but it seems to be a McCloskeyan view that market forces are powerful instruments that can solve most problems, including problems of growing shortages of commodities as huge countries like China and India proceed with their long-delayed industrialization. My world view is that capitalism is a powerful human innovation that is an unparalleled wealth creator, but that for the first two centuries of industrialization it has benefited only a few “advanced” countries in North America, Europe, and Japan. Now it is the turn of the rest, so in the 21st century we see emerging giants like China and India claiming their share. They are likely to put enormous stresses on commodity and fossil fuel supplies if they continue to grow the traditional “business as usual” economy, or what I call the “black economy.” But because of geopolitical pressures and immediate environmental concerns, these countries are also growing a “green economy” that is based on generation of power from renewable resources and recirculation.

tion of resources via a circular economy. Consequently I see these countries as driving the “next” great transformation as they switch away from conventional fuels and commodities to products of manufacturing: renewable power from manufactured devices like solar cells and wind turbines, and resource recirculation (e.g. “urban mining”) via the innovation of a “circular economy.” (For more on this, see my articles with Hao Tan, “Economics: Manufacture Renewables to Build Energy Security,” *Nature*, Sept. 10, 2014, and “Circular Economy: Lessons from China,” *Nature*, March 23, 2016.) So there are two kinds of economies bidding for supremacy in these emerging giants: a black and a green economy. Which one wins will be the outcome of a political struggle because the state plays an all-important role in these industrializing economies.

How is this likely to affect commodity and fuel prices? In the medium term there is likely to be a peaking in demand as China, India, et al. scale up, driving up prices. In the longer term, it is likely that the green economy will supersede the black economy, where costs will be falling—and the price of energy is likely to reflect those cost falls. So I judge it likely that there will be a rising trend in prices for industrial commodities over the course of the next decade because of the continued dominance of the black economy, but energy prices will fall as the green economy overtakes the black economy and power generated from manufactured devices becomes more important than power generated from fossil fuels. As previous industrial transitions demonstrate, the lower cost process or product tends to drive the higher-priced product out of the market.

In terms of the bet itself, I see the point of replicating the original Simon–Ehrlich basket of commodities over a 10-year period. I accept this aspect of Carden’s challenge. But the commodities concerned—copper, chromium, nickel, tungsten, and tin—are no longer central to industry. So I agree that we should have a further bet involving fossil fuels—particularly coal, oil, and natural gas—because they are central to the industrializing efforts of both China and India. We could agree to take the NYMEX prices of these three commodities as benchmark, in the way proposed by Carden (but without heating oil and gasoline, which are processed versions of crude oil). We could start the twofold bet on January 1, 2017 and take it up to December 31, 2026, a full decade. We could agree and publicly announce the procedures to govern the bet, including an amendment to Carden’s proposal to the effect that the winner be declared by a neutral arbiter, and that the winnings be paid to a nonprofit institution of the winner’s choice. We could revisit the bet each year to review how we are each traveling. And if circumstances allow, we could create a second round of the bet in the following decade, 2027 to 2036.

I am confident in taking on this bet because I am confident that we are moving toward a world that is greening, where energy, water,

and food will become cleaner, safer, more abundant—and cheaper. This is because I view the dominant greening trends as substituting manufactured products for products based on natural resources that are mined, drilled, or otherwise extracted from the earth or grown in the earth. In energy China is clearly moving to a system that prioritizes renewable power (clean, safe, abundant, and cheap) over fossil fuels. (See my most recent discussion, “China’s Continuing Renewable Energy Revolution—Latest Trends in Electric Power Generation,” *Asia-Pacific Journal*, Vol. 14, Issue 16, No. 6 [Sept. 1, 2016].) In the case of water, desalination processes linked to solar power make it increasingly feasible to source water from the ocean, which is analogous to sourcing electric power from renewable and abundant resources. In the case of food, we see that plants and vegetables will increasingly be grown and harvested in an enclosed environment, utilizing renewable energy and desalinated water (for an example, see my article “Tomatoes Watered by the Sea: Sprout-

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*There are two kinds of economies bidding for supremacy in China and India: a black one and a green one. Which one wins will be the outcome of a political struggle because of the state’s role in these industrializing economies.*

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ing a New Way of Farming,” *TheConversation.com*, Feb. 16, 2014), while traditional animal products like meat, eggs, and milk will increasingly be produced through tissue culture on a vast scale (like brewing) without murdering or torturing animals.

I see China and (eventually) India as driving these greening trends, just as the United States was the dominant power driving the fossil-fueled industrial paradigm in the 20th century. This is the context within which commodity prices will increasingly be set in a shrinking “black economy” with less and less influence being imposed from shortages of natural ores and mineral sources. Capital is likely to flow increasingly to these clean, green, and safe processes rather than traditional fossil-fueled and commodity-driven processes, making their investment costs lower. This is what I am calling the greening of capitalism and I see it as substituting manufactured (artificial) processes and products for “natural” products and processes. That is why I see the long-term cost trend of “natural” commodities (in the black economy) as upward as they become subject to shortages, and the long-term cost trend of renewable power, renewable water, and cultured food as downward in the emerging green economy. The forces driving these cost and price dynamics are very different from those that guided the thinking of both Ehrlich and Simon.

**John A. Mathews**  
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## BRIEFLY NOTED

# Do-It-Yourself and Distrusting Markets

◆ BY RYAN MURPHY

How many times have you heard that you can save money if you “do it yourself” (DIY)? At *diynatural.com* (“Do It Yourself ... Naturally”), you can find recipes for homemade versions of fabric refresher, mass-produced snacks, and shampoo. Other DIY websites and cable TV programs show people how to tile their bathrooms, build their own computers, and rewire their homes. And, of course, for generations people have worked on their own cars and done their own landscaping rather than “outsource” the tasks.

Besides saving money, many of these DIYers say they are motivated by the enjoyment they find in such work; it is a consumption good. They like getting under the hood, they like running the power saw. The work needs to be done and they get utility from doing it, so why shouldn't they do it themselves?

I contend that these arguments are wrong—or, at least, incomplete. I think that many DIY efforts are motivated not by pleasure or frugality, but by wrongful distrust of markets. That doesn't mean that people are always wrong to attempt home projects—or even cook their own meals or mow their yards—but they should be mindful that the reasons given for such efforts often are problematic. In many cases they'd be better off picking up the Yellow Pages and contracting with an expert rather than buying costly tools and attempting a project that requires considerable skill and experience to master.

**Transaction costs** / When should you undertake a home project in order to save money? The answer theoretically rests on whether the project is in your comparative advantage. If your comparative advantage lies elsewhere and you operate on the

assumption that markets work as vehicles of mutually beneficial exchange instead of tools of exploitation, then in a perfect world you should do it yourself only when those tasks are what you do professionally. Otherwise, you are better off working an extra hour and paying someone else to perform the task you aren't as adept at. (Of course, we don't live in this perfect world, and we'll consider that below.)

Suppose, on the other hand, that you're a DIYer because you enjoy it. Then why don't you do such projects full-time, for money? Comparative advantage isn't defined solely by your ability to create  $x$ -number of widgets per hour; it is also determined by how little pay you are willing to accept in exchange for making those widgets. That amount falls if you enjoy performing the task. (Think of Ivy League grads working for peanuts in the offices of Major League Baseball teams). If you actually enjoy an activity that the market remunerates with pay, then why work without pay to produce precisely the amount you want to consume, but without performing those tasks at all for money?

The answers to both of these questions lie in an economic fundamental: transaction costs. In his famed 1937 article, “The Theory of the Firm,” Nobel economics laureate Ronald Coase explained how and why firms choose to hire workers versus outsourcing everything. Transaction costs help explain this. It is difficult and costly to contract out each individual task on a case-by-case basis. Firms will be more profitable if they simply hire workers on long-term

contracts to perform the tasks rather than go through this process endlessly.

Similarly, you should do it yourself when the process of hiring someone to perform the task for you is too costly. It is not difficult, generally, to hire someone to mow your lawn on an ongoing basis. In contrast, cutting a shrub after a sudden realization that it has grown too long is assuredly a time to do it yourself.

One could argue that not everyone can afford to hire someone to mow his lawn. However, if we take the idea of comparative advantage seriously enough, does this argument make sense? Suppose my marginal revenue product is \$9 an hour. For any other employment, including mowing my lawn, the implicit marginal product of my labor must be less than \$9. In a frictionless labor market (a caveat relevant only for the short run), the argument for mowing my own lawn because I cannot afford to hire someone is an argument for working another hour at my job. It is actually prudent to do the thing that seems imprudent to do: “waste” money on outsourcing my yard work.

The argument that “DIY is a consumption good” should also be considered in light of transaction costs. I enjoy cooking, but I do not believe I could find someone who would hire me to cook only when I want to. But it's certainly imaginable that there are many people out there who would be better off if they took a four-hour shift on Friday nights working at a restaurant. The reason why I cannot easily contract to work for someone is that no one I know would want to hire me to make chicken parmesan for a dozen people on a Friday night.

One other justification for you to do it yourself is that markets may be too thin for you to purchase exactly what you want. The rationale of customization is one of the better arguments for DIY. If a Google search for the precise good you wish to purchase does not yield the correct item, it may indeed be rational to do it yourself.

**Negative-sum game?** / The reasoning presented above reduces the question about DIY to conventional microeconomic

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A formal presentation of this argument is forthcoming in the *Independent Review*.



ing in market transactions? One may argue that this bias undercuts our ability to figure out how to best choose the most efficient way of achieving what we set out to do. But others may not see it that way. French economist Antoine Beretti and colleagues argue in a 2013 article in *Kyklos* that monetary exchange comes with repugnancy costs built in, meaning people may dislike the idea of monetary exchange just as they may dislike the idea of eating a cat (though perhaps not as extreme).

The issue of interpretation—are people being irrational or is this simply reflective of preferences?—is very similar to the murky question of sunk costs. (Do we accept illusions because we have a

issues. What are the transaction costs? Are there labor market frictions preventing you from finding a job with the exactly optimal number of hours for you to work? Are markets too thin for you to find just what you want? It is easy to criticize neo-classical economics for assuming *homo economicus* and leaving out the essentials of what it means to be human, but these are pretty basic ideas that should inform what consumers do. Unfortunately, these ideas are generally absent from those DIY websites and TV shows.

The underlying logic of “saving money” is really viewing the market as a negative-sum transaction. In this view, when you buy something from Walmart, you are somehow getting the brunt of the negative sum. This is why “buy it at Walmart” so rarely enters discussions of DIY advocates. The fact that Walmart profits from the transaction becomes ipso facto evidence that you would be better off doing it yourself, even if that means that an anesthesiologist is spending three hours of her labor to “save” \$7.

What gives rise to these intuitions is the underlying psychology of folk economics,

a concept developed by Emory University economist Paul Rubin in an article of the same name published in the *Southern Economic Journal* in 2004. Our brain is built to think about economics in certain ways, just as it is built to think about biology or the physical world in certain ways. But these ways are optimized for the period during which the human brain evolved. The world of positive-sum transactions is relatively new. When confronted with a member of another tribe or an entity that is perceived to have only its own interests in mind (like a multinational corporation), the human mind reflexively sees zero-sum as the best outcome for the exchange.

Humanity living under capitalism is the economic equivalent of a world made up of illusions. Our brains struggle to operate in either world. These forces give rise to what George Mason University economist Bryan Caplan calls anti-market bias in his 2007 book, *The Myth of the Rational Voter*.

**Irrationality or preference?** / This raises a question: is anti-market bias a cognitive mistake or is it a simple distaste for engag-

ing preference for being fooled?) A sufficiently strong statement on the subjectivity of value would require economists to accept the public’s annoyance at ignoring sunk costs as a preference. But since economics textbooks do not take this position, it would be consistent to see repugnancy toward markets as irrationality, not a preference.

Businesses perform cost-benefit analyses to help assess complicated choices when the profit-maximizing path is not immediately obvious. I submit that DIY should be approached the same way, with reasonable figures attached to the value of your time (i.e., your hourly wage rate). Any such analysis would, of course, consider the fact that many DIY activities are in part consumption goods. But the situations where DIY actually makes sense pertain to the economic imperfections of the real world: transaction costs are greater than zero, frictions exist, and there are not an infinite number of sellers and buyers. These are simply not the primary stated reasons of the many advocates of doing it yourself. Hence, in many cases DIY is a mistake, owing to distrust of markets. **R**

## BRIEFLY NOTED

# When Does Antitrust Activity Stifle Innovation?

◆ BY IKE BRANNON

**W**hen does an improved product become an entirely new and different product than what it's improved upon, and when does the government consider that new product to constitute a monopoly that needs to be broken up? The legendary agricultural equipment maker John Deere is about to find out.

In 2014 the company came out with a new planter that featured an innovative system allowing it to plant seeds while moving as fast as 10 mph, or twice as fast as planters normally go these days. Besides saving farmers a lot of time, the big advantage of this system is that it allows more of a crop to be planted at an optimal time in the growing season, thereby boosting yields.

Shortly after Deere unveiled this innovation, a company called Precision Planting, a division of Monsanto, came out with its own high-speed planting system that could be attached to existing planters to achieve the same precision and speed as the Deere planter. Deere responded the next season by coming up with its own high-speed planter attachment for existing planters. Soon afterward, Precision Planting partnered with two of Deere's major competitors—Case-International Harvester and AGCO (whose brands include Massey Ferguson)—to allow them to offer Precision Planting's technology as an option on their new planters.

At the end of 2015—about 18 months after the appearance of high-speed planters—this flurry of activity culminated in Deere making an offer to buy Precision Planting, which was accepted. Last month, the Justice Department's antitrust division announced it would sue to stop the merger, claiming that the combined entity would have a virtual monopoly over the high-speed planter market and would thus be anticompetitive.

**Distinct market?** / Of course, whether there is a separate “high-speed planter market” or just one broad market for planters fast or slow is the relevant question to ask. After all, scarcely two years ago there was no such thing as a high-speed planter, and the majority of planters being used in the field today are not high-speed planters. The two are interchangeable and it's still not completely clear just how much the new version improves field output. No one seems to think that every farmer will have a high-speed planter in the near future.

These days most economists tend to be leery of claims that a merger will produce a harmful monopoly. As long as competing firms have the ability to enter the market, it

stands to reason that new firms will appear if Deere sets the price on its planter too high. However, the Justice Department produced a memo from one of Deere's employees stating that the merger would “lock up” the market for high-speed planters, owing to the patents and intellectual property that the combined entity would hold.

Maybe that would be true in the short-run, but there's no reason to think that competing companies couldn't figure out a way to come up with their own original innovations and boost market share. If Deere charges too high a price, its competitors will have a very lucrative incentive to do precisely that. In fact, two competitors—Kinze and Horsch—have already entered and together comprise nearly 15% of high-speed planter sales. The Justice Department's complaint describes Kinze's and Horsch's products as inferior and suggests they would never be as efficient as the Precision Planting or Deere products, but that implies a degree of foresight that would be unusual for a bureaucrat.

The government isn't very prescient when it comes to determining a market—Microsoft's domination of the market for internet browsers in the late 1990s didn't last terribly long or inflict too much lasting damage, despite the government's con-



PHOTO COURTESY OF JOHN DEERE

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cerns about that market concentration.

The Justice Department's lawsuit isn't the last word, of course; normally it negotiates with the parties involved in mergers it doesn't like in order to reach some sort of settlement that the bureaucrats deem acceptable. But in the case of John Deere and Precision Planting, such talks apparently came to naught—predictably, perhaps, since there does not seem to be much that could be spun off to lessen the combined entity's market share. Besides, it's quite likely that the DOJ and Deere have completely conflicting viewpoints about what the market share actually is. And it is hard to conceive of the company licensing its intellectual property to a competitor at some "reasonable" price negotiated by Justice.

**Conclusion** / It's hard not to conclude that the government's attempt to call high-speed planters a new market, distinct from

other planters, amounts to moving the goalposts in the middle of a game. There's no evidence that not having high-speed planters will put any farmers out of business, or that every farmer (or even most farmers) will feel compelled to buy one even if his current planter is fully depreciated.

Two companies made sizeable investments in research and development and came up with a nearly identical innovation at precisely the same time that radically improved productivity for an existing product. The tight competition this engendered meant that neither manufacturer made nearly the profits it expected. So they merged. Condemning this as something government should stop is a difficult argument to make.

One thing is certain: if the Justice Department's decision to stop the merger is upheld, it will make some companies think twice about what sorts of innovations they pursue. R

who (like Trump) had promised to cut regulations, a Republican House and Senate majority (albeit narrow), and a regulation that was well-known, controversial, and issued in the waning days of the previous administration.

That rare combination returns in January 2017 with Trump, who pledged to repeal up to 70% of previous regulations, and a Republican majority in both chambers, many of whom also promised voters that they would do something about onerous regulations that are costing U.S. jobs. Republicans have spent the last few years laying the groundwork for comprehensive regulatory reform, from how courts grant deference to agencies to the role of congressional oversight and the practice of cost-benefit analysis.

Using the CRA might make sense, but if Congress has a large list of rules it wants to repeal then even using expedited procedures could consume valuable floor and committee time. Enter H.R. 5982, the Midnight Rule Relief Act, proposed legislation that would amend the CRA to allow joint resolutions of disapproval en bloc. This would permit the new Congress to review every rule finalized in the last 60 legislative or session days of the 2016 term, which would cover roughly the last six months of 2016. If the bill passes, then these rules would be generally stricken until Congress in essence redelegates the rulemaking power to agencies.

**The rules** / If Congress does pass the Midnight Rule Relief Act and it is signed into law, what rules would Congress consider repealing? The first one many conservatives want to target is the Clean Power Plan, President Obama's signature climate change rule. But because it was finalized in 2015, it is ineligible for review under CRA procedure. Thus, to undo the rule would require either a series of appropriations riders or the new administration following the Administrative Procedure Act to formally repeal the regulation.

There are a host of other notable and controversial regulations that many in Congress would like to address. Because

## Suggestions for President Trump's First Deregulatory Push

◆ BY SAM BATKINS

President-elect Trump has promised that he will repeal many of the regulations issued by his predecessor and that this will help foster higher economic growth. The reality is more complex: without new legislation, he will find it difficult to roll back much of President Obama's regulatory handiwork. Even with the necessary legislation, there may be relatively little savings from such a roll-back. What Trump should be able to do is stop the implementation of rules issued in the waning months of Obama's term and work with Congress to identify and fix other problematic regulations.

**The process** / The Congressional Review Act (CRA) allows Congress, with the signature of the president (the important

part), to repeal a regulation under expedited procedure in the House and Senate. The CRA has only been used successfully once, however, largely because instances of one party owning large congressional majorities and the White House are rare. (See "Do Presidents Rush Rules to Avoid the Congressional Review Act?" Fall 2016.)

The only successful CRA vote was in 2001, with the Department of Labor's ergonomics rule. A rare confluence of circumstances generated this successful repeal: an incoming Republican president

## BRIEFLY NOTED



the eligible period under the CRA stretches from sometime in May to the end of President Obama's term, the total universe of rules is close to 200. Here are some of the largest rules issued since May that could be repealed, along with their total estimated costs:

- Phase 2 Greenhouse Gas Standards for Trucks, \$29.3 billion
- Overtime Rule, \$2.9 billion
- Aviation Drone Rules, \$2.5 billion
- Drilling in the Outer Continental Shelf, \$2 billion
- Disclosure of Payments by Resource Extraction Issuers, \$1.2 billion
- Fracking Emissions Standards, \$890 million
- Fair Pay and Safe Workplaces, \$872 million
- Treatment of Certain Interests in Corporations, \$280 million

Combined, these rules will impose more than \$5 billion in annual economic costs and 8.5 million paperwork burden hours. That \$5 billion figure wouldn't get Trump anywhere near his 70% goal (depending on his denominator), but it would represent a rolling-back of regulatory activity and would doubtless please many of his supporters in the transportation, energy, and labor sectors. In addition to those rules, Congress could scrutinize new efficiency standards for refrigerators, which promise to raise prices for consumers.

Just out of the CRA's grasp is the Department of Labor's Fiduciary Rule,

which will impose more than \$31 billion in cumulative costs. The administration was wise to transmit that rule to Congress as soon as it was published in the *Federal Register*. It did the same with the Overtime rule, which may not be eligible for repeal depending on how many days Congress meets in December. Sometimes the delay in publication and transmission can take months.

There are at least five final rules awaiting formal publication that President Obama is planning to release before leaving office, all of which are related to energy and the environment and likely to pique the interest of Congress. For example, final rules governing natural gas production on public lands could cost more than \$1.4 billion. The newest version of the Renewable Fuels Standard and the "Stream Protection" rule for the coal industry are also pending. Combined, these rules are estimated to cost \$2.2 billion and generate 2.5 million new paperwork burden hours.

There are other rules not subject to CRA that Congress and the next administration may want to review separately. If they decide to go after the Affordable Care Act's most significant regulations, there will be plenty of targets: subsidies and regulations establishing federal exchanges, the de facto banning of Health Savings Accounts, and the Essential Health Benefits rules would likely be altered, for instance, and the regulations leading to standardized health plans—which Republicans have complained limit choice and

drive up insurance costs—will also be ripe for review in any Affordable Care Act reform.

**Limits to benefits from repeal** / While Republicans may lament that the CRA only applies to the last few months of an administration, that may be for the best. While reaching further back might score some political points, repealing rules that have already been implemented for some time will have a negligible economic effect and may not pass a cost-benefit analysis. For example, the Environmental Protection Agency implemented the Mercury and Air Toxics Standards in 2012, and despite some legal setbacks in the courts, it has largely resulted in coal power plants shutting down or switching to natural gas. The seismic changes in the energy world—especially the shift to natural gas-fired generation—mean that these power plants will likely never operate again. Similarly, the Volcker Rule might be a credible candidate for repeal, but many financial institutions began winding down their proprietary trading desks as soon as Dodd-Frank passed and would not be reconstituted soon regardless of the applicable rules.

It is important to realize that repealing a few past rules won't affect economic growth or boost employment. Generally, a piecemeal deregulatory approach is hardly ideal, considering how little one rule affects the national economy and how easily future administrations can repropose measures. It would be far better

for the new administration to contemplate broader procedural reform to provide for a lasting solution to regulatory accumulation. However, the Midnight Rule Relief Act would allow Congress to bundle dozens of major regulations, with billions of dollars in annual costs, and undo the final gasps of a presidency.

Few would dispute that the regulatory state imposes compliance burdens on U.S. businesses that total somewhere near \$1 trillion, but significantly reducing that

burden is a difficult task. While President-elect Trump promised to repeal 70% of all regulations, the near-term reality is that the best he could do would be to repeal a mere handful of recent regulations and save the economy \$5 billion in annual compliance costs. However, such a step could prove to be the first big leap in a series of reforms that conservatives and libertarians have sought for decades that would change how our government issues and implements federal regulations. **R**

that no warming is occurring, but rather that the models' dire forecasts have been wrong—at least so far.

**Clouds** / Another way to assess models is to look at internal errors and systematic flaws. Here's where Frank comes in.

To build a successful climate model, researchers need to include all the factors that can affect atmospheric temperatures. One factor to include is CO<sub>2</sub> levels. Another is clouds. Clouds both reflect incoming and trap outgoing radiation. A world entirely encompassed by clouds would have dramatically different atmospheric temperatures than one devoid of clouds. But modeling clouds and their effects has proven very difficult. The Intergovernmental Panel on Climate Change (IPCC), the established global authority on climate change, acknowledges this in its most recent *Assessment* report:

**The simulation of clouds in climate models remains challenging.** There is *very high confidence* that uncertainties in cloud processes explain much of the spread in modelled climate sensitivity. [bold and italics in original]

What is the net effect of cloudiness? A cooler atmosphere. Some 342 watts per square meter (Wm<sup>-2</sup>) reach the earth's atmosphere, on average, keeping it warm enough for us to thrive. Clouds both reflect incoming solar ultraviolet radiation, providing a cooling effect, and prevent the escape of infrared energy back into space, supplying a warming effect. The net effect of clouds is to cool the atmosphere by about 25 Wm<sup>-2</sup>. This means that without clouds, more energy would reach the ground and our atmosphere would be much warmer. There's the rub.

Clouds are hard to measure and predict, and climate models have an uncertainty of ±4.0 Wm<sup>-2</sup> that is due purely to clouds. This error is 114 times as large as the estimated extra energy from excess CO<sub>2</sub> (±4.0 Wm<sup>-2</sup> versus 0.035 Wm<sup>-2</sup>). In totality, the combined errors in climate models produce an uncertainty of about ±150 Wm<sup>-2</sup>, which is equal to 44% of all

# A Fatal Flaw with Climate Models

◆ BY CHARLES L. HOOPER AND DAVID R. HENDERSON

Patrick Frank is a scientist at the Stanford Synchrotron Radiation Lightsource (SSRL), part of the SLAC (formerly Stanford Linear Accelerator Center) National Accelerator Laboratory at Stanford University. The SSRL produces extremely bright x-rays as a way for researchers to study our world at the atomic and molecular level.

In a bit of a shift, Frank has shone a bright light on general circulation models (GCMs)—models used to predict long-term changes in climate—and illuminated some fatal flaws. His bottom line is that these models, as they stand today, are useless for helping us understand the relationship between greenhouse gas emissions and global temperatures. This means that all the predictions of dramatic impending warming and ancillary calls for strong government action are based on conjecture.

**Modeling climate** / The atmosphere is about 0.8° Celsius warmer than it was 100 years ago. Given that the atmospheric concentration of carbon dioxide has risen 40% since 1750 and that CO<sub>2</sub> is a greenhouse gas, we have the antecedents for a compelling hypothesis: the increase in CO<sub>2</sub> has caused, and is causing, global warming.

But a hypothesis is just that. For obvious reasons we can't test this hypothesis by running a controlled experiment where we increase and lower CO<sub>2</sub> levels around the globe and measure the resulting change in temperatures. Instead, scientists build sophisticated GCMs based on known and assumed physical properties and run them on supercomputers. They then compare the forecasted results for various scenarios to each other and to reality.

GCM forecasts for the years 1998–2014 predicted much greater warming than what actually happened. If the models were doing a good job, their predictions would cluster symmetrically around the actual measured temperatures. That is not the case here; a mere 2.4% of the predictions undershot actual temperatures and 97.6% overshot, according to Cato Institute researchers Patrick Michaels, Richard Lindzen, and Chip Knappenberger. Climate models as a group have been “running hot,” predicting about 2.2 times as much warming as what actually occurred over 1998–2014. Of course, this doesn't mean

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incoming energy and is over 4,000 times as large as the estimated extra energy from higher CO<sub>2</sub> concentrations. The underlying question that Frank raises needs to be addressed by climate scientists: How can the faint CO<sub>2</sub> signal possibly be detected by climate models hampered with such gigantic errors?

Frank points out that systematic cloud errors are the same across climate models, and shows that this could occur only if two conditions hold: (1) all the climate models employ the same theory, and (2) that theory is flawed. Further, Frank has published papers that explain how the errors in temperatures recorded by weather stations have been incorrectly handled and how temperature readings have an error of  $\pm 0.46^\circ\text{C}$ , not the  $\pm 0.2^\circ\text{C}$  claimed by others. In a 2011 article in the journal *Energy & Environment*, he states:

The 1856–2004 global surface air temperature anomaly with its 95% confidence interval is  $0.8^\circ\text{C} \pm 0.98^\circ\text{C}$ . Thus, the global average surface air temperature trend is statistically indistinguishable from  $0^\circ\text{C}$ .

For our purposes, we will focus on the fact that the CO<sub>2</sub> “signal” that climate scientists say is responsible for increasing temperatures is overwhelmed by the error in their own models.

It’s really a signal versus instrument resolution issue. If you are timing a high school track athlete running 400 meters at the beginning of the school year, and you measure 56 seconds with your stopwatch that reads to  $\pm 0.01$  seconds and your reaction time is  $\pm 0.2$  second, then with your equipment you can clearly measure an improvement to 53 seconds by the end of the year. The difference in the two times is far larger than the resolution of the stopwatch combined with your imperfect reaction time, allowing you to conclude that the runner is indeed now faster.

What if this runner then dons some high-tech running shoes designed to knock 0.05 off the 53-second time? Your hypothesis is that the runner would be faster because of the fancy shoes, but can

you actually measure such a small difference with the instrumentation at hand? No. There is no point in even running the experiment because you will have no way of knowing if the runner is slightly faster, is running at the same speed, or is slightly slower. That’s the case with climate models and CO<sub>2</sub>.

That’s our way of putting it. In a 2008 article in the journal *Skeptic*, Frank puts it this way:

It’s as though a stronger and stronger distorting lens was placed in front of your eyes every time you turned around. First the flowers disappear, then the people, then the cars, the houses, and finally the large skyscrapers. Everything fuzzes out leaving indistinct blobs, and even large-scale motions can’t be resolved. Claiming GCMs yield a reliable picture of future climate is like insisting that an indefinable blurry blob is really a house with a cat in the window.

The IPCC has looked at a number of different cases and it reports that temperatures could be, in the worst case, up to  $4^\circ\text{C}$  higher by 2100. However, based on Frank’s work, when considering the errors in clouds and CO<sub>2</sub> levels only, the error bars around that prediction are  $\pm 15^\circ\text{C}$ . This does not mean—thankfully—that it could be  $19^\circ$  warmer in 2100. Rather, it means the models are looking for a signal of a few degrees when they can’t differentiate within  $15^\circ$  in either direction; their internal errors and uncertainties are too large. This means that the models are unable to validate even the existence of a CO<sub>2</sub> fingerprint because of their poor resolution, just as you wouldn’t claim to see DNA with a household magnifying glass.

In a recent podcast for the Center for Industrial Progress, Frank concludes thus:

Large systematic errors make projections of future Earth temperatures entirely unreliable. What do climate models reveal about a human [greenhouse gas] fingerprint on the terrestrial climate? Nothing.

He adds:

One cannot say that CO<sub>2</sub> has definitely caused the mild warming in the climate. We have absolutely no idea what is going on. The climate has warmed and cooled in the past without any changes at all from us or from changes in carbon dioxide or apparently in greenhouse gases, and the changes that we’ve seen are well within natural variability, and so as far as we can tell, nothing important is going on.

He argues that, given this, there’s no scientific merit to predictions of dramatic future warming, there’s no reliability of the IPCC’s warnings, and there’s no evidence of a looming climate disaster from CO<sub>2</sub> emissions. The most rational thing to do right now about the “problem” of CO<sub>2</sub> emissions? Have the courage to do nothing.

For all the drumbeat of “the science is settled,” the relationship between CO<sub>2</sub> emissions and climate change is a topic where our ignorance is far greater than our understanding. It would be wiser to wait until we have a more complete understanding of the atmosphere before committing to expensive policies. To do otherwise is to act based on conjecture. R

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# Defending the Indefensible Mortgage Interest Deduction

BY IKE BRANNON

I hate the mortgage interest deduction (MID) and I never tire of telling people why. Its flaws are twofold: First, since it is a deduction, it means that a homeowner can benefit from it only if he has a big enough mortgage (combined with his other deductions) to bother with itemizing deductions rather than take the standard deduction. According

to the Tax Foundation, only about 30% of all taxpayers currently do this—the richest third. Since the homeownership rate is around 62%, this means that less than half of all homeowners avail themselves of the MID. The ones left out would be the middle-class homeowners—the ones who could actually use some sort of housing assistance.

The second problem is the MID's benefits scale up with income, as homeowners move up into a higher tax bracket or buy more expensive houses. A guy making \$75,000 a year with a \$200,000 home in Peoria, Ill. gets a deduction of \$1,500 from his mortgage interest—but only if he has enough deductions elsewhere to itemize, which he probably doesn't. The MID would save him less than \$400 given his tax rate.

Meanwhile, a San Francisco tech entrepreneur making \$500,000 a year and living in a \$1 million home might deduct as much as \$40,000, saving over \$20,000—or almost 40 times the middle-class guy in the Midwest. The MID's benefit grows disproportionately with income, which is simply indefensible, and does little to boost homeownership.

And I'm setting aside the fact that few economists who study housing issues consider homeownership an unalloyed good worth subsidizing at all. The oft-repeated notions that homeowners are more civic-minded, more likely to be employed, and have more stable home lives may be true,

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but they confuse cause and effect and thus don't justify policymakers' attempts to create more homeowners.

Most people in the real estate world understand these truths and behave accordingly when called on to defend the MID. A few months ago I was on a dais with an economist employed by a major player in the industry. After I vivisected the mortgage interest deduction, the microphone passed to him and he completely ignored my remarks, instead talking about something else. After the event concluded I asked him why he didn't respond to my comments. He explained that he and other industry reps realized long ago that a public-spirited

defense of the MID simply does not exist, and that their practice, when put in a spot to defend it, is to simply change the subject. They know it's a fight they can't win.

**Keynesian stimulus?** / A few people never got that memo, however. As Congress has begun to explore tax reform more seriously, a couple of economists and institutions have given a full-throated defense of the MID and its supposedly beneficial effects on homeownership and the economy.

One such effort is a 2014 paper from the Heritage Foundation, written by Curtis Dubay. He reasons that while the MID may do little to boost homeownership (acknowledging that its savings is fully offset in current home prices, which is yet another reason to dispense with the deduction), it is nonetheless good policy because it incentivizes the 30% of the population that do avail themselves of it into spending more money on housing. And, this reasoning continues, since housing represents an "investment" for these people, and investment is a key ingredient in economic growth, it therefore stands to reason that the deduction boosts growth.

It's an impressive sleight of hand: the trick employed here is to conflate the meaning of the word "investment." Economists reserve the word to mean money spent by firms on plant, equipment, technology, or other things that will boost productivity and future output. But people do not invest, they *save*. While savings creates funds available for firms to make investments, not all of what we save is used that way.

Housing is most emphatically *not* an investment; it amounts to one way for people to hold their wealth. When people spend more money on housing, it does not improve the productive capacity of the econ-

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omy one iota; indeed, the more wealth people have wrapped up in their home means they have less money available to put into stocks or bonds or their bank, where that money could be used to invest in expanding the capacity of the economy. In fact, some economists have blamed a portion of the slowdown in productivity growth in the early 2000s on the massive uptick in spending on constructing new homes.

Dubay implicitly acknowledges this uncomfortable fact and tries to zigzag around it by arguing that the increase in spending on housing *stimulates the economy*, and that the spending creates more jobs building houses, manufacturing home products, and the like. For a Heritage Foundation paper, this is a remarkably Keynesian argument. But it's Dubay's only option if he wants to defend the mortgage interest deduction. Without this situational embrace of a left-wing economic perspective, he would be caught in an utterly unjustifiable position—which, of course, he could avoid by simply choosing not to defend the deduction in the first place.

**Main Street Republicans?** / Jeffrey Anderson of the Hudson Institute offers a different defense of the deduction. He recently took issue with the tax plan released by House Republicans this summer for its effective, surreptitious gutting of the MID. The Republicans would nominally preserve the deduction, but they would create an environment in which few people take it.

Their plan would do this by boosting the standard deduction, lowering and flattening tax rates, and eliminating most other deductions. That means that fewer people would find it worth their while to itemize. If high-income earners are only saving 30 cents of each dollar of mortgage interest paid instead of 39.6¢, they would have to pay much more interest to make it worth itemizing. And if there are few other deductions a taxpayer can take, it means that the interest paid has to be higher still to make it worth itemizing and forgoing the standard deduction.

In particular, the deduction for state

and local taxes tends to go arm-in-arm with the MID because most people with a mortgage will also deduct their property taxes, which can be anywhere from 40% to 100% or more of the amount of the mortgage interest deduction. Eliminating that deduction—which the House Republicans' plan would do—drastically reduces the size of a homeowner's tax deductions and makes it much less likely that she will itemize and, thus, deduct her mortgage interest.

As a result, enacting the Republican House tax plan would reduce the proportion of people itemizing from 30% today to less than 5%, according to estimates from the Joint Committee on Taxation. This, Anderson avers, would hurt "Main Street" Republicans, which is apparently his moniker for those in the 6th–30th percentile of the income distribution.

In essence, he appears to be arguing for a code with higher tax rates, more deductions, credits, and exclusions, and more tax brackets because—what? It would help the wealthy to afford their houses? It's sheer nonsense. It is not a secret that the housing and real estate industry would prefer to keep the present jury-rigged contraption of a tax code because of the outsized impact it gives to the MID, but it is not something they would ever admit. Bully for Anderson for clearly articulating that completely corporatist logic and then trying to spin it as good for the overall economy.

The sad reality is that the MID isn't going anywhere, simply because its patrons are too powerful. There are over one million realtors in the United States, many of whom are exceedingly wealthy, and their political arm, the National Organization of Realtors, takes in nearly \$300 million a year. If the deduction ever came under attack, it's easy to conceive of them raising another \$300 million to finance a defense. The various state-level realtor organizations collect hundreds of millions of dollars a year as well, not to mention the trade associations for the homebuilders, mortgage bankers, roofers, drywallers, plumbers, tile installers, title insurers, and the like.

The realtors and their allies know how to push all the levers of politics, as I've

seen firsthand. A decade ago I wrote a speech for a politician I worked for that took an indirect swipe at the MID. When we traveled back to his home state the next month, he met with a group of local realtors. Their leader told him they were disappointed in his comments on the MID and they wanted to show their displeasure. Upon his command the 100 or so in attendance stood on their chairs and began yelling loudly. My boss profusely apologized and blamed it (correctly) on his economist. He instructed me to never touch the topic again.

The realtors and their allies are aggressive about heading off all assaults on the deduction. A few years ago I wrote a piece in my hometown paper in Peoria suggesting that a proposal that was then being floated to cap the mortgage interest deduction at \$500,000 would be a good thing for the residents of the city. A six-figure ad campaign financed by Peoria's homebuilders, realtors, and mortgage bankers defending the deduction quickly ensued.

Shortly thereafter I called a realtor friend who pulled the listing of sales of houses over \$600,000 in the area for that year—that is, homes that would be affected by such a cap. There were less than a dozen houses above that threshold. In essence, the ad campaign cost more than such a cap would have cost central Illinois homeowners.

There is no honest public policy rationale for the MID. It is a tax break that will cost the U.S. government nearly \$1 trillion in the next decade while accomplishing nothing save for boosting the prices for the homes of upper-middle-class families. It also does nothing to make housing more affordable for the middle class and below. Those who attempt to argue otherwise do so via half-truths, semantic games, or obfuscation. R

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