IN REVIEW

Why—and How—to Repeal and Replace Obamacare

REVIEW BY DAVID R. HENDERSON

I f you think that the Patient Protection and Affordable Care Act (ACA, also known as Obamacare) is bad because of its expense, the distortions it causes in the labor market, its failure to provide people what they really want, and its highly unequal treatment of people in similar situations, wait until you read John C. Goodman's *A Better Choice: Healthcare Solutions for America*. You will likely conclude that the ACA is even worse than you thought.

That's the bad news. The good news is that Goodman, a health economist and senior fellow with the Independent Institute, proposes reforms that would do more for the uninsured than the ACA does, and at lower cost, and also would make things better for the currently insured. And it would do all this while avoiding mandates, creating more real competition among insurers, and making the health care sector more responsive to consumers. Not all of his proposals are problem-free, but many of them are a step in the right direction.

Solving 'the problem' / I can't do justice to the many problems with the ACA that Goodman points out, but a number of them are encapsulated in a story that he tells about 136 fast-food restaurants he studied. The restaurants, he explains, "initially employed close to 3,500 workers, about half of whom were full time (30 hours or more a week)." The potential cost of providing health insurance to the full-time staff "was about $7 million a year." But the employers took advantage of legal

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loopholes in the ACA to reduce that cost "to less than 1 percent" of $7 million.

How did they do that? They started by making all hourly workers part-time workers. Goodman points out that that's not as easy as it sounds because if one worker fails to show up, another worker must fill in, and then that worker's hours can jump above the 30-hour threshold. By the end of the year, that had happened to only 58 employees, who were then eligible for mandated health insurance the next year.

So the employers, to comply with the law, offered those 58 employees "Obamacare-compliant health insurance (Bronze plans)." Under the law, employers could require employees to pay 9.5 percent of their annual pre-tax wage for health coverage. A $9-an-hour employee working 30 hours a week would then pay $111 a month in premiums. But because such a plan has a high deductible and copayments, it's not very attractive to a low-wage, low-income worker. So of those 58 employees, only one opted for the Bronze plan. The rest chose a Minimum Essential Coverage (MEC) plan, paid for entirely by the employers. That way, the employees

A Better Choice: Healthcare Solutions for America

By John C. Goodman

121 pp.; Independent Institute, 2015

escaped the ACA fine for being uninsured. And employers escaped the fine for not offering ACA-compliant health insurance: they had offered it, but only one employee had taken up the offer.
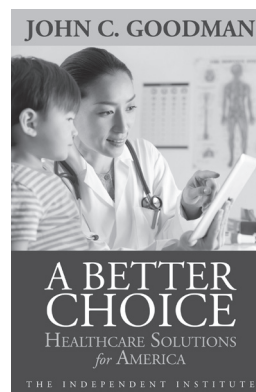
Problem solved, except for one thing: that "problem" was finding the lowest-cost way for the employers to deal with the law. For the employees, there are all sorts of problems: Many of them went without insurance because they worked under 30 hours a week, and many had insurance before the ACA. Moreover, many of them are working fewer hours than before and therefore earning less than they would if the ACA had not been implemented. Does anyone think that those unintended consequences, which are the opposite of the goals that President Obama and congressional Democrats claimed to want—and probably did want, are good?

Principles of reform / Goodman points out the unequal treatment that the ACA gives to modest-income families. In many states, he explains, a family with income up to 138 percent of the poverty level would qualify for Medicaid. Medicaid spends an average of $8,000 per year for a family of four. But if someone in the family earned a few extra dollars and suddenly the family was just over 138 percent, they would lose eligibility for Medicaid and have to buy insurance in a health exchange. Goodman argues that the subsidy that the family would get in the health exchange, on a $12,000 annual health insurance policy, would be $11,100. That's pretty unequal treatment.

Goodman lays out six principles of health insurance reform and then proposes policy changes based on those principles. The principles are choice, fairness,

universal coverage, portability, patient power, and real insurance. Briefly, here's what he means: Choice means that people "should be free to choose a health plan that fits individual and family needs, rather than one designed by bureaucrats in Washington." Fairness means that "if the government subsidizes health insurance, then the subsidy should be the same for everyone at the same income level." "Universal coverage" means that everyone has health insurance or that the few who don't, under his tax credit proposal (more on that below), would get health care from "safety-net institutions" in the communities in which the uninsured live. "Portability" means that people who leave jobs can take their health insurance with them. "Patient power" means that patients make choices between spending on health care and spending on other things. "Real insurance" means that people buy insurance that reflects their risk, just as with auto insurance or life insurance.

Because Goodman believes in choice, he would have no mandates requiring employers to provide insurance or people to get insurance. But if that were the case, why would low-income people get insurance? Most of them would do so, he argues, because of a large tax credit they would receive in order to buy it. He would make the tax credit $2,500 per adult and $1,500 per child. A family with two parents and two children, therefore, would get a tax credit of $8,000 toward health insurance. Even a family with a federal tax liability of less than $8,000 would get the whole tax credit. The euphemism that Goodman and others use for such a credit, which can exceed one's prior tax liability, is that it is "refundable." With no mandates requiring specific coverages (e.g., required maternity coverage for families that are going to have no more children), a family could get a lot of health insurance with that $8,000.

Money problem / How would Goodman have the feds fund it? He would end the tax-free treatment of employer-provided health insurance. Doing so, he estimates, would raise $300 billion a year. He would

also end the ACA subsidies that he estimates to be $200 billion a year. In addition, he would end government spending on indigent care at all levels of government.

I don't think that quite gets him there, though. Nowhere in the book could I find an estimate of the cost of tax credits to about 310 million people. But the math is not difficult. With about 240 million adults, the cost of the tax credit for adults would be $600 billion. With about 70 million U.S. residents under age 18, the

Allowing local governments to collect unused tax credits is the weakest part of Goodman's plan. He has far too much faith in the IRS and local governments.

cost of the tax credit for children would be about $105 billion. That roughly $700 billion total would then require substantial cuts in other government spending. Goodman could get there, without other cuts in government spending, by making the tax credit $2,000 per adult and $1,000 per child, making the overall cost $550 billion. But then, of course, that family of four would get a tax credit of "only" $6,000 toward health insurance.

Goodman grants that even with his large proposed tax credit, not everyone would buy insurance. How would he handle that? Local governments could claim the unclaimed tax credits of the residents in their area who do not buy insurance and use them toward subsidized health care. This is the weakest part of his tax credit proposal. I laid out some reasons why in my review of his earlier book, *Priceless*, in which he made this same proposal ("The Price Is Wrong," Fall 2012). I wrote:

> First, the local government doesn't have a strong incentive under Goodman's scheme to use the money well. Second, one can imagine a city government fighting a county government over who gets how much of the block grant.

I think Goodman has far too much faith

in both the Internal Revenue Service and local governments.

And it should be noted that subsidizing people's health insurance is an inefficient way of helping many of them. This is the bottom line of a study of Oregon Medicaid by MIT health economist Amy Finkelstein, Harvard's Nathaniel Hendren, and Dartmouth's Erzo F. P. Luttmer. In a recent paper for the National Bureau of Economic Research, titled "The Value of Medicaid," they found that that value to recipients is only 20 to 40 cents per dollar of spending.

Covering the high-risk / Goodman, as noted above, also believes in "real insurance." That is, he wants insurers to be allowed to price for risk. He argues that because they are no longer allowed to fully do this under the ACA (which limits how much premiums can differ between low- and high-risk people), insurers will try to avoid insuring the sick and will seek out the healthy. How will they do this? By forming narrow networks of doctors and hospitals that sick people will find less attractive.

One problem, of which Goodman is aware, is that when insurers are allowed to price for risk, people with pre-existing conditions can get insurance but will pay dearly for it. How would he handle this problem? He would have the aforementioned tax credit granted only to people who bought catastrophic insurance and only to people who bought "change of health status insurance." Under the latter, health insurers "would pay the extra premium needed if a person's health deteriorated after becoming insured and he or she needed to switch to another health plan." Of course, that is not much comfort for those who start with poor health. I don't have a good solution for this problem, but Goodman and Obama don't either. It's a tough problem. The good news is that people who start with poor health are a small percent of the population.

Goodman is strongest on the issue on which he has always been strong: patient power. He points out that most insured people would pay their own dollars for health insurance that is priced higher than the tax credit—and most insurance likely would be. As a result, those people would pay more attention to the kind of insurance they get and to how they spend their own health care dollars. He also points out that in two areas of health care where patients spend largely their own money—cosmetic surgery and laser eye surgery—

prices are falling and/or quality is improving. He gives other examples of changes on the supply side—from price competition for drugs over the Internet, to retail clinics, to telephone-based practices—that are making things better and often cheaper for patients. Goodman points out that if patients were spending their own money, other parts of the health care system would respond by making things more consumer-friendly.

Will we see any of the policy changes that Goodman proposes? Time will tell. **R**

A Defense of Paternalism

◗◗ **REVIEW BY PHIL R. MURRAY**

Classical liberals naturally resist paternalism. Milton Friedman wrote that "the paternalistic ground for government activity is in many ways the most troublesome to a liberal; for it involves the acceptance of a principle—that some shall decide for others—which he finds objectionable in most applications." Besides cases involving

"children" and "madmen," people identifying as liberal have historically considered any paternalistic policy to be unacceptable.

That's not the case today. In their new book, *Government Paternalism*, Julian Le Grand of the London School of Economics and Bill New, an independent policy analyst, offer a powerful argument in support of government paternalism. In particular, they endeavor "to see if they could successfully meet what might be thought of as the John Stuart Mill challenge: are there circumstances in which the individual's own good is sufficient warrant to justify a paternalistic intervention?" They define government paternalism, describe conditions under which they believe it is justified, and present three potential scenarios for paternalism.

When is paternalism warranted? / After reviewing the academic literature on

paternalism, the authors "conclude that a government intervention is paternalistic with respect to an individual if it is intended to address a failure of judgment by that individual [and] further the individual's own good."

By "failure of judgment" or "reasoning failure," they mean bad decisionmaking. They attribute such failures to four separate causes:

- limited technical ability
- limited imagination/ experience
- limited willpower
- limited objectivity

To possess "limited technical ability" is to struggle with—or simply ignore—math. For example, the buyer of a lottery ticket probably doesn't bother to compute the probability of winning.

Having "limited imagination/experience" is to not appreciate how one's perspective would change in alternative scenarios. For example, a healthy, financially secure young adult cannot fathom being a poor senior citizen in need of medical care. "Limited willpower" is straightforward enough. Young adults who can imagine being old and who know how to calculate how much income they'll need in retirement might still have "limited willpower" to save regularly. As for "limited objectivity," there are many types of this failure. Smokers, for instance, may lowball their increased risk of cancer, thinking simply that it would never afflict them. Le Grand and New, consistent with behavioral economists, expect us to think that reasoning failure afflicts almost everyone.

Consistent with conventional economists, the authors assume that individuals face tradeoffs—in the case of paternalism, between well-being and autonomy. The authors "acknowledge that autonomy can be 'placed on the scales' and weighed against an individual's well-being." It is possible to imagine special cases of individuals giving up autonomy in order to obtain greater well-being. People stranded on a desert island might be willing to give up some autonomy in order to acquire adequate food, clothing, and shelter. Le Grand and New try to convince us that not-so-desperate individuals will also give up some autonomy in order to achieve greater well-being.

Policy tools / The tools of government paternalism are "legal restrictions," "taxation," "subsidy," and "nudging or framing." By legal restrictions, the authors mean prohibition (of alcohol, for instance) or a mandate (the use of seatbelts, for instance). Paternalistic taxes, of course, aim to reduce behavior such as smoking or drinking. Paternalistic subsidies aim to promote activities such as "the cessation of

Government Paternalism: Nanny State or Helpful Friend?

By Julian Le Grand and Bill New

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smoking or the eating of healthful foods." Nudging and framing reflect the idea of "libertarian paternalism" as described by Cass Sunstein and Richard Thaler. According to Le Grand and New, taxes, subsidies, and nudging produce a more favorable tradeoff between well-being and autonomy than legal restrictions. Three scenarios illustrate their analysis.

If a government paternalist can demonstrate that some individuals participating in a given activity suffer from some reasoning failure, he can then use a policy tool to counteract that failure. The authors assert that the following outcomes increase the likelihood that such intervention is justified:

- People who suffer from reasoning failure "experience a large increase in well-being as a result" of the intervention.
- People who *do not* suffer from reasoning failure but who nonetheless change their behavior because of government intervention "do not suffer greatly as a result" of the intervention.
- Concerning all people who change their behavior because of intervention, some of whom suffer reasoning failure and some of whom don't, the people with reasoning failure outnumber the people without.
- Among all those who *do not* change their behavior despite the intervention, the people without reasoning failure outnumber the people with reasoning failure.

If those conditions seem abstruse, the authors' scenarios should help illuminate.

First, consider smoking. According to the authors, many smokers have "limited willpower," fail to anticipate becoming addicted, or lowball their chances of contracting cancer. Yet Le Grand and New reject outright prohibition of tobacco because of historical experience "of the prohibition of alcohol in the United States and of the 'war' against illegal drugs." They reason that "it is likely that a significant portion of both those with reasoning failure and those without it will continue smoking" despite any legal restrictions. Among other reasons, they claim "there is a substantial impact on the autonomy of smokers of any kind, whether they suffer from reasoning failure or not, or whether they stop smoking or not." Although the authors' analysis appears long on speculation and short on data, they conclude that prohibition is worse than the alternatives.

An alternative policy is taxing the sale of tobacco. The main difference between a tax and a ban is the effect on autonomy: a government ban eliminates the choice to smoke legally, but taxation allows choice although it exacts a price for lighting up. Thus the authors favor a tax over a ban.

The authors also endorse the "libertarian paternalist idea" of a "smoking permit." Under such an intervention, the smoker's autonomy remains intact except for the nuisance of obtaining the permit, which makes the permit a better policy than a ban.

But what are the effects of a permit on well-being? Le Grand and New conjecture that smokers with reasoning failure who forgo the permit and quit smoking will "likely" experience a substantial increase in their well-being. Borrowing from another "libertarian paternalist" idea, they reason that if the number of spendthrifts with reasoning failure who remain automatically enrolled in a pension plan is a "reasonable guide" to the number of smokers with reasoning failure who would forgo the permit and quit smoking, there may be many of them. The authors offer no evidence, however, that the decision to forgo a smoking permit reflects the decision to remain enrolled in a pension plan.

It is easier to buy their argument that the number of smokers without reasoning failure who forgo a permit will be small. Given that those smokers believe the benefit of smoking is greater than the health risk, there's nothing stopping them from obtaining a permit other than the nuisance.

Because Le Grand and New expect a large number of smokers with reasoning failure to decline the permit and quit smoking, one may infer that they expect a small number of smokers with reasoning failure to obtain the permit and continue smoking.

All those groups of people—those with and without reasoning failure, and those who forgo the permit and quit smoking and those who don't—are at least as well off as they would be when faced with a ban or a tax on smoking. The authors conclude that "the permit idea at least seems to be worthy of serious consideration."

The second scenario Le Grand and New consider is saving. "In general," they claim, "people do not save enough for their pension." Therefore the government paternalist aims to encourage individuals to save more.

The primary source of reasoning failure in this case is "limited imagination": young people cannot foresee themselves as old. Le Grand and New dub those with reasoning failure, who save little of their incomes, "myopics." In contrast, "farseers" save little of their incomes but they do not suffer from reasoning failure—apparently they have some good reason for near-term consumption.

Three policies aim to promote saving: "legal compulsion," "tax relief," and a "libertarian paternalistic policy whereby people are automatically enrolled in a pension plan unless they opt out." If the government requires everyone to save, according to the authors, the well-being of myopics will increase and the well-being of farseers will decrease. They do not mention the well-being of myopics or farseers who ignore the mandate. They do mention that "there is obviously a significant loss in autonomy for all groups, both perceived and actual."

Tax relief increases the well-being of myopics who take the tax break and save more. Their increase in well-being "is likely to be greater," Le Grand and New add, than under a mandate because tax relief reduces the cost to them of saving more. They point out that tax relief will induce fewer myopics to save more than a mandate. Thus, it is unclear whether the increase in well-being per myopic who saves more, multiplied by the number of myopics who save, is greater under tax relief or a mandate.

Tax relief increases the well-being of farseers who take the tax break and save more. The authors do not mention the well-being

of myopics who ignore the tax break; presumably it stays the same. The authors do mention that the well-being of farseers who decline the tax break and continue to save little remains the same. Tax relief causes little, if any, decrease in anyone's autonomy. Le Grand and New point out one drawback: "Tax relief can be highly regressive."

The "libertarian paternalistic policy" designed to promote saving switches the employee's default decision from not participating to participating in a saving plan. In other words, employees are "automatically enrolled … unless they opt out." The well-being of myopics who remain enrolled and save more increases. In theory there would be no farseers who remain enrolled, because farseers lack reasoning failure and would fill out the paperwork to avoid saving more than they prefer. On the other hand, there would be few myopics who fill out the paperwork in order to avoid saving because they do possess reasoning failure. As with tax relief, "there may be little loss in autonomy." Le Grand and New implicitly endorse this policy of "changing the default position" over the alternatives of a mandate and tax incentives to encourage more saving.

Knights or knaves? / Le Grand and New are not overzealous; they demand evidence of reasoning failure before intervention and they require a gain in well-being that outweighs a loss in autonomy. They see the possibility of "too much paternalism." Consider their analysis of a ban on assisted suicide. The authors reckon that people with reasoning failure who cannot commit assisted suicide will experience an increase in well-being, and people without reasoning failure will experience a decrease in well-being. They argue that the number of people without reasoning failure "is likely to be much larger than" the number with reasoning failure. Therefore the ban reduces overall well-being. Couple that with the loss in autonomy and Le Grand and New decide that "assisted suicide should not be prohibited."

Credit the authors for addressing objections to government paternalism. They ask, "Might not [government officials] be subject to the very kinds of reasoning failure that we have ascribed to people engaging in self-damaging behavior?" According to them, reasoning failure applies to individuals making "their own decisions," but not individuals making "decisions on behalf of others." Therefore the authors are confident that citizens will not bear the burden of bad decisions made by disinterested government officials.

Le Grand and New also believe that government paternalism withstands the insights of public choice economics. They recognize that, for example, even if politicians are nominally responsible for promoting the well-being of citizens, they might do whatever garners the most votes. They nevertheless have faith that "elections," "referendums," and "sunset clauses" will make government officials act more like "knights" than "knaves."

Le Grand and New recognize that government paternalism may weaken an individual's ability to make good decisions. Their response, if my understanding is correct, is that a reduced capacity to make decisions is a part of the autonomy loss that must be offset by an increase in well-being. That, perhaps, is insufficient assurance that government paternalism will not cause decisionmaking ability to atrophy. And one wonders why we don't leave paternalism to family and friends.

Le Grand and New conclude that government paternalism is a "helpful friend," not a "nanny state," because government paternalism "usually operates in an impersonal manner." Though the authors are not overzealous, they might be overconfident that justifying even more politicization of decisionmaking carries as little risk as they seem to think it does. **R**

Washington Establishment vs. Millennials

✒ **REVIEW BY SAM BATKINS**

From spending money and passing on the bill to the next generation, to forcing the young to subsidize health care premiums of seniors, and passing licensing laws that place countless hurdles in front of new entrepreneurs, there are plenty of regulations that burden younger Americans. In *Disinherited*, Manhattan Institute scholars

Diana Furchtgott-Roth and Jared Myer blend personal anecdotes from millennials (those born between the early 1980s and the early 2000s) and relevant data that lend empirical support to the premise that federal and state policies routinely disfavor the young.

Furchtgott-Roth and Meyer survey three main policy areas: wealth transfers from young to old, a broken education system, and regulatory policies that disproportionately target youth. Not to proclaim all doom and gloom, they also devote a section of

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the book to reform proposals. While not entirely novel, their prescriptions for change offer a fresh perspective on the tired "rich vs. poor" debate and ask whether the real controversy is "old vs. young."

Typically, millennials are hardly a source for sympathy because they are often complicit—if not downright supportive—of the policies that harm them. But the same generational scorn could have been leveled against previous generations. Millennials might be difficult to appreciate, yet reversing many of the policies that currently harm them would do a great deal to enhance economic freedom in the United States.
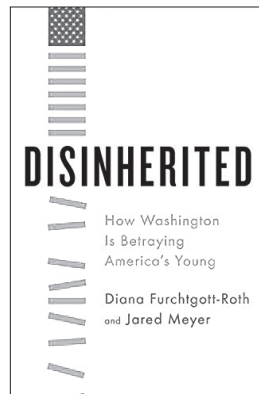
Wealth transfers / Even casual observers of public policy know about the unfunded government mandates that the current generation and its progeny will soon have to face. Rather than focus entirely on Social Security and Medicare, the book unravels the Affordable Care Act (ACA) and its financial imposition on younger Americans. The law's modified community rating ensures that the oldest enrollees can be charged no more than three times what the youngest, healthiest enrollees are charged. For consumers in New York, the old age band was 1:1, which explains why the state's individual market utterly collapsed before the federal government started dispensing subsidies. In a surprise to few health economists, last year 27-year-old men experienced a 91 percent premium spike because of the law. Senior citizens and middle-aged Americans saw premium increases at a fraction of that rate.

The Congressional Budget Office offered fuel to the anti-ACA argument recently, finding that full repeal of the law would boost employment and wages, and add 0.7 percent to gross domestic product. This comes on the heels of a CBO report last year that found the United States would lose the equivalent of 2.5 million full-time workers by 2024, mainly because of labor incentives in the ACA. As Furchtgott-Roth and Meyer argue, this has a disproportionate effect on the young, likely cutting their hours and making their labor more expensive.

Bad apples in education / Much ink has been spilled over the years evaluating the "military industrial complex." The "education industrial complex" should receive similar scrutiny, including its implications for students and new teachers. The authors argue that teachers unions and

Disinherited: How Washington Is Betraying America's Young

By Diana Furchtgott-Roth and Jared Meyer

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tenure make it nearly impossible for qualified new teachers to enter the market and for poorly performing ones to exit expeditiously. The problem, the authors note, is not pay, as the average teacher receives $57,000 in direct compensation. The problem is that it's virtually impossible to fire bad teachers.

In Chicago and New York City, only one in 1,000 teachers loses his or her job for poor performance, and in Los Angeles fewer than 2 percent are denied tenure. Yet, graduation rates in those jurisdictions barely top 50 percent. These policies not only hurt the youngest among us—students—but they also create state barriers to entry for new teachers.

To remedy those problems, Furchtgott-Roth and Meyer push for school choice, namely charter schools. They cite research finding that the average charter school student in New York City could be expected to close 86 percent of the Scarsdale-Harlem achievement gap. This gap compares one of New York's wealthiest neighborhoods (Scarsdale) to one of its poorest (Harlem).

School choice is hardly a novel solution to the nation's educational maladies, but the book does well to demonstrate how failed policies harm the young.

School choice is hardly a novel solution to the nation's educational maladies, but the book does well to demonstrate how failed education policies disproportionately harm the young.

We don't need no regulation / The authors spend the third part of their book deconstructing the regulatory state and incumbent protections that harm start-ups and the young alike. Chief among the regulatory evils are licensing requirements that increase costs, present barriers to entry, and limit opportunity. Americans are routinely told that there is a "fundamental right to work," although some constitutional scholars might quibble. However, the government routinely inserts itself into determining the qualifications of yoga instructors, hair braiders, and makeup artists.

For Melony Armstrong, who aspired to start a hair braiding business in Tupelo, Miss., the fundamental right to work clashed with a yet-unknown "hair lobby" in the state. She was required to undergo 300 hours of coursework to obtain a "wigology license," which is something that unfortunately exists in this nation. This mandated training didn't contain a single tip on braiding hair. Before expanding her business, she was required to complete an additional 3,200 hours of classwork. As the authors note, in the equivalent amount of time she could have been licensed as an EMT, police officer, firefighter, paramedic, real estate appraiser, hunting instructor, or ambulance driver. Fortunately, Armstrong sued and the governor relaxed the hair braiding regulatory morass to a $25 fee and compliance with basic hygiene rules.

Beyond licensing rules, the authors spend a chapter reviewing perhaps the most infamous of regulations: the minimum wage. Despite the plethora of academic studies highlighting the folly of wage and price controls, populist politicians can't resist the urge to correct inequality through what they view as a "free" program. There is no direct federal or state outlay for raising the minimum wage and low-income employees receive a pay bump, so everyone wins. What the politicians ignore is that the biggest hurdle to crossing the poverty line is getting a job. Creating artificially high costs for labor makes it more likely that many—specifically younger—Americans will fall on the

wrong side of the labor pool. As a result, the youth unemployment rate is already nearly double the overall rate and labor participation rates are lower as well. Yet, there are still "serious" policymakers who ignore this evidence and proclaim that a teenager in the rural South should be paid the same wage as one in Scarsdale, N.Y. This lunacy is naturally lost during the tired debate over wage controls.

Conclusion / The rise of millennials, who now outnumber baby boomers, should be treated as the start of a new chapter for the nation. Yet, as Furchtgott-Roth and Myer demonstrate, state and federal policies routinely disfavor the young. As the first generation in history with a risk of enjoying a lower standard of living than their parents, there are tremendous risks for the nation and for economic liberty if they falter.   R

The Case for 'Misbehavior'

✦ REVIEW BY DAVID R. HENDERSON

University of Chicago economist Richard H. Thaler, probably the most important founder of "behavioral economics," is a fantastic storyteller. In his latest book, *Misbehaving*, he tells, roughly chronologically, of his initial doubts about the standard economist's "rational actor" model and how those doubts led him to set his

research agenda for the next 40 years. In chapter after chapter, he tells of anomalies—bits of evidence that are inconsistent, sometimes wildly so—with the various economic models and of his debates with the proponents of those models. In Thaler's telling, he always won the debates. One would expect him to say that, but as someone who did not start out on his side of the debates, I think he often did win.

One disclosure: In 1975, about the time he was coming up with his list of doubts, I became an assistant professor of economics at the University of Rochester's business school, where Thaler was also an assistant professor. We overlapped for my first three years at Rochester, until he moved on to Cornell. That disclosure probably does not matter, except for the fact that I saw close-up how he developed his ideas in the face of a fair amount of hostility from some of his colleagues. I was skeptical, but not

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hostile.

In a review of this length, it's impossible to cover all of the topics Thaler discusses. So I'll focus on five: the endowment effect, his quest for other scholars who were interested in the same ideas, financial economists' efficient market hypothesis (EMH), various methods employers use to affect their employees' saving for retirement, and the question of whether mistakes get small when the stakes get large.

Homo economicus and homo sapiens / At the start of the book, Thaler distinguishes between "Econs" and "Humans." Econs are the rational economic actors who can easily figure out which deal is better, are never misled by the order in which alternatives are presented, always ignore sunk costs, etc. His Humans are people who make every imaginable mistake and who, he claims, are actually representative of most people. Time and again when discussing various issues, he reminds us what Econs would do and compares that to what actual humans (notice the small "h") do. The contrast is often large.

Consider what he calls the endowment

effect. In laying out the effect, Thaler presents the results of two versions of a question he asks his students. In version A, he tells them that they have been exposed to a rare disease that they have a 1 in 1,000 chance of contracting. If they get the disease, they will die within a week. They can take an antidote now that, with certainty, will prevent death. How much, he asks, are they willing to pay for the antidote? A typical answer is $2,000.

Then he presents the same students with version B, telling them that they can choose whether or not to enter a room in which they will have a 1 in 1,000 chance of getting that same disease. The question: how much do they have to be paid to be willing to enter the room? The answer should be something close to $2,000, possibly a little higher to reflect what economists call the "wealth effect": if they are paid to accept a small risk, they are slightly wealthier than if they must pay to avoid a small risk. But the typical answer? $500,000. Thaler calls this phenomenon the endowment effect because, he explains, "the stuff you own is part of your endowment" and "people valued things that were already part of their endowment more highly than things that could be part of their endowment." He gives numerous other examples that, I suspect, will ring true with most readers.

Search for others / In the mid-1970s, after coming up with his list of the kinds of human behavior that are at odds with the economic model of rational behavior, Thaler set out to find other people working on the same sort of issues. A large part of his book is about that quest. I remember when he started the quest shortly after I arrived at the University of Rochester, and I remember thinking—and I still think—that he had a lot of courage in marching to the tune of a very different drum.

As mentioned, Thaler is a great storyteller. His tales of how he met some of the other key players in behavioral social science—Daniel Kahneman, who later won the Nobel Memorial Prize in economics for his work, Amos Tversky, who died early but probably would have shared the Nobel,

and others—are enjoyable and occasionally inspiring.

EMH / When Thaler and I were both at the University of Rochester, it was one of the top schools in finance. One of the main players there was Michael Jensen, whose hero was the great financial economist Eugene Fama, under whom Jensen had done his dissertation. You couldn't be around there for long without getting somewhat steeped in the financial literature. The dominant view in finance then was the efficient market hypothesis (EMH), according to which stock prices incorporate all public information because if they didn't, investors could gain by selling overpriced stocks short or by buying and holding underpriced stocks.

That view made complete sense to me. After all, with millions of dollars of their own wealth on the line, wouldn't investors be the paragons of rationality? The problem, as Thaler learned over the years, is that there are many anomalies. He discusses the most important ones. One is that stock prices are "too" variable. If prices are based on fundamentals, how could stock prices have fallen an average of 20 percent on "Black Monday," October 19, 1987, based on no apparent news? Also, if investors are rational, why would they settle for buying shares in firms that pay dividends? The favorable tax treatment of capital gains—capital gains are taxed at a lower rate and only when they are realized—should mean that firms owned by Econs should never pay dividends.

Interestingly, Fama and his University of Chicago co-author Ken French altered their model of stock prices in response to the evidence, bringing in two other factors—company size and value. They claimed that those factors would make both "value stocks"—those whose share prices appear low relative to their earnings—and small-

company stocks riskier and, thus, earn higher returns. But, notes Thaler, "Fama and French were forthright in conceding that they did not have any theory to explain why size and value should be risk factors." Moreover, notes Thaler, a paper by financial economists Josef Lakonishok, Andrei Shleifer, and Robert Vishny found that value stocks are *not* riskier.

Retirement saving / Thaler has also been a leader on the issue of saving for retirement,

> *If everyone were an "Econ," it wouldn't matter what the employer's default option is for signing up employees to a tax-advantaged retirement plan.*

based on his taking account of humans as they are and not as economists usually model them. He points out that if everyone were an Econ, it wouldn't matter whether employers' default option was not to sign up their employees for tax-advantaged retirement accounts or to sign them all up and let employees opt out. Because signing up and signing to get out are both so low-cost relative to the stakes involved, either option should lead to the same percentage of employees taking advantage of the program. But that's not what happens. Thaler cites research by Brigitte Madrian of Harvard's Kennedy School of Government showing that before a company she studied had tried automatic enrollment, 49 percent of employees joined the plan. When enrollment became the default, 84 percent of employees stayed enrolled.
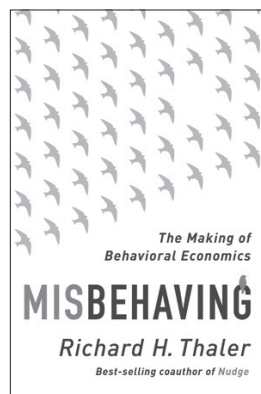
High-stakes mistakes / One of the arguments that economists often make against Thaler's view of humans is that most of his evidence comes from low-stakes situa-

Misbehaving: The Making of Behavioral Economics

By Richard H. Thaler

415 pp.; W.W. Norton, 2015

tions in which the gains from being rational are not large. However, they assert, when the gains are large, humans tend to be much more careful. But, using evidence from the National Football League's entry draft, Thaler makes a strong argument against this view.

NFL teams are multi-multi-million-dollar enterprises, and their draft picks represent multi-million-dollar decisions. Surely, if there is strong evidence of rationality, it would be in the NFL. But Thaler shows that NFL owners and managers seem to make poor draft decisions.

For instance, he discusses the considerable evidence that teams are better off "trading down"—that is, swapping a single early-round draft pick for multiple later picks—and trading away a draft pick this year for multiple picks in future drafts. Yet, few teams employ those strategies. He even tells of a conversation he had about these issues with Dan Snyder, owner of the Washington Redskins, which led Snyder to send two of his top managers to talk to Thaler and his colleague Cade Massey. Their subsequent draft picks showed that they ignored Thaler's advice. And, as anyone who follows the Redskins knows, they paid dearly, highlighted by the bonanza of high-round draft choices they traded away for a single pick in 2012, which they used to draft Robert Griffin III.

There is one major discordant note in this otherwise solid book: Thaler's evaluation of the work of economist John Lott, who once offered a critique of Thaler's work at a University of Chicago workshop. (I'm not claiming that Lott's critique was sound.) Thaler writes of Lott's book, *More Guns, Less Crime*: "As the title suggests, the thesis of the book is that if we just made sure every American was armed at all times, no one would dare commit a crime." That is *not* the thesis of Lott's book, which is much more nuanced. (See "Torturing the Data?" Winter 2010–2011.) Although Thaler is generally good at presenting the

ideas of economists who disagree with him, he did a poor job with Lott's views.

Conclusion / Assuming that we are persuaded of many of Thaler's claims, what are their implications for government policy? He sees many. He and his then–University of Chicago colleague Cass Sunstein co-authored their 2008 book, *Nudge*, about such implications. Unlike many critics, as I explained in my review of the book ("A Less Oppressive Paternalism," Summer 2008), I do find merit in some of their proposals grounded in "libertarian paternalism," a term they coined. Given the latest Supreme Court decision on same-sex marriage, one of their proposals—getting the government out of marriage altogether—has become even more relevant.

But Thaler and Sunstein drastically understate the problems that arise because the people in government doing the nudging are also Humans, not Econs. And bureaucrats have generally bad incentives to nudge in the "right" direction. On this point, I laid out my criticisms in more detail in my review of Sunstein's 2013 book, *Simpler* ("Simpler? Really?" Fall 2013.)

Thaler answers that he and Sunstein "went out of our way to say that if the government bureaucrat is the person trying to help, it must be recognized that the bureaucrat is also a Human, subject to biases." He expresses his frustration that "no matter how many times we repeat this refrain we continue to be accused of ignoring it." But the accusation is understandable, as they keep advocating government intervention.

The best way to show that they do not ignore this problem is for them to advocate taking large amounts of power out of the government's hands. As I've written elsewhere, one way to reduce government power and make people more aware of its activities—after all, many of the problems Thaler cites are due to people's being unaware—is to get rid of tax withholding. That way, people can be more aware of their tax bill, which is one of the major costs of government. He has not yet advocated that idea.

Maybe we should nudge him. **R**

Complexity and Command-and-Control

🐾 **REVIEW BY GEORGE LEEF**

I f Middlebury College economist David Colander and theoretical physicist Roland Kupers wanted to get pro-market, government minimalists like me to read their new book, then they did a good job of picking its title, *Complexity and the Art of Public Policy*. The idea of solving problems "from the bottom up" is an appealing one because most public policy operates in the exact opposite direction, and their addition of "complexity" is intriguing.

Wondering if Colander and Kupers would shed new light on how to reform the bad policies we currently endure and avoid adopting more of them, I dove into the book and soon encountered this passage:

> The standard way of doing policy considers our social system as a suburban garden. It tills, plants, and cultivates as if the parts are not interrelated. For example, it accepts that people have the tastes they have, and works within that framework. The complexity way of doing policy sees everything as interrelated; tastes are endogenous, and one must consider how tastes are affected by policy, whereas in the standard frame one does not.

So if we "do policy" according to their "complexity frame," can we actually devise laws and regulations that are superior to the old "suburban garden" approach? Apparently they think so; I wanted to see exactly how.

Revising "I, Pencil" / The authors proceed to tell us that humans could better solve their problems if policymakers would stop thinking in either "market fundamentalist" ways or in top-down, command-and-control ways. Instead, they say, policymakers should adopt the more reasoned, mathematically based "complexity frame"

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of analysis. Hearing that "market fundamentalist" animadversion, I started to suspect that the authors' ideal of "complexity analysis" is more amenable to state power than to laissez-faire.

That suspicion was confirmed in their chapter, "I Pencil Revisited." Colander and Kupers look at Leonard Read's famous 1958 essay and maintain that while it makes a useful point about the way prices and market competition work to coordinate the production of an item nobody could produce on his own, it shortchanges the importance of government. They go so far as to offer this addition to Read's original text: "So, to tell the complete story of my production, I need to include government, and the many other collective groups, such as the Pencils Producers Association to which my family belongs, that assist government in its coordination role."

Colander and Kupers suggest that the reason why Read didn't mention government in his essay was that he feared that including it "would lead some people to expand the role of government." In this, they're mistaken. Read simply figured that most people understood fairly well that we need government to protect property rights and settle disputes, but that very few had any clue at all about the amazing coordinating power of the free market. That's why his "ode" extols uncoerced human cooperation and leaves government out. Read was not an opponent of government, but argued that it has to stick to its rights-protecting, order-keeping functions. If it does so, then the market works to produce pencils and all

sorts of other goods and services.

Complexity analysis / The authors, on the other hand, believe that government needs to do more so that people can better solve their problems. Complexity science, based on cutting-edge advances in math and computation, supposedly improves upon our ability to comprehend social systems by seeing how everything affects everything else. Supposedly it can give us better policy than the minimal state of the "market fundamentalists."

That idea fascinates the authors and they envision a future in which "individuals can still have significant freedom of action, while achieving collective social goals." Expecting that they would offer some concrete examples of how complexity analysis would improve upon the minimal "night watchman" state advocated by thinkers in the Smith/Bastiat/Read tradition, I read on.

Remarkably, there were none.

Could complexity analysis help us better adjust our welfare system, reduce teen unemployment, or improve upon our dismal educational results? The authors never venture into any such specific questions.

They do inform us that the Dutch used complexity thinking to improve traffic flow, adopting roundabouts at intersections. But it's unclear why they think that advancement requires expanded government intervention in markets; if roads were privately owned, the owners would seem to have plenty of incentive to adopt the most efficient traffic controls.

The authors suggest that complexity analysis could be useful in banking regulation—but then admit that it might be more useful to *firms* in banking and finance, better enabling them to manage their operations. Again, this doesn't give much support to expanded government

intervention. One does wonder, though, if we didn't have all the moral hazard–creating government rules for such firms, would there be any need for regulating their complex operations?

Colander and Kupers also say that complexity analysis could be important in environmental regulation. Perhaps, but with so much disagreement among experts about how, and how much, to control pollution, there would seem to be too much complexity for good policy.

Complexity analysis, no doubt, has important uses. But after reading the book, I'm not persuaded that government policy is among them. Despite the authors' criticism of "market fundamentalism," I don't see how complexity analysis could have improved societies where that "fundamentalism" prevailed. Would Hong Kong, for example, have been more prosperous and its people happier if Sir John Cowperthwaite had tried "laissez-faire activism" (as the authors call their preferred policy) instead of plain old laissez-faire?

A big part of their activism involves governmental "nudging" of people to do what they "really want to do" but can't discipline themselves to do. Colander and Kupers like the idea of policy that doesn't dictate to people, but merely encourages them to do what they ought to do. They embrace the idea, most famously advanced by Cass Sunstein and Richard Thaler, that behavioral economics "creates a new role for applied policy economists, that of choice architect; government policy creates the choice architecture within which people make decisions." Thus, public policy might be fashioned to nudge people to eat less junk food and save more money.

The authors fail to explain, however, what "nudging" has to do with complexity and, more importantly, why nudging should be a function of government rather
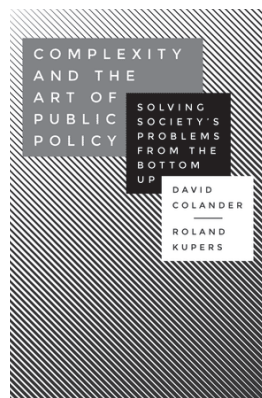
than of society's many voluntary organizations. Churches have been nudging people for thousands of years to behave better, probably with some success. So have a host of personal improvement groups such as Alcoholics Anonymous. Moreover, the apparent need for "nudging" would often disappear if we made the law less complex. For instance, a big reason why most Americans no longer save very much is that the tax code penalizes thrift. It seemingly would make more sense to change the tax code than to create countervailing nudges.

Another policy change Colander and Kupers advocate is the encouragement of "for-benefit" organizations. Such organizations "blend the social motives of a nonprofit with the financial sustainability motives of a for-profit" and "turn the power of the market toward social problems," they write.

Indeed, it might prove to be the case that successful philanthropy is better accomplished through for-benefits than either through the "earn it and donate it" approach or through government welfare systems. What is missing here is any need for policy change. Nothing is preventing, for example, eBay founder Pierre Omidyar from engaging in philanthropy through a for-benefit model. The free market's discovery process will find the optimal kinds of philanthropic organization without any governmental nudging or complexity analysis.

Bad complexity / In their enthusiasm for "the complexity frame," Colander and Kupers overlook the possibility that it might actually lead to policies that interfere with the ability of many individuals to solve their problems from the bottom up. Nowhere do they advert to the problems that public choice economists argue are almost inevitable once the government goes beyond those neutral, rights-protecting functions that people like Read thought should be its limits. Rent-seeking factions could try using complexity analysis as a cover to get what they want, hiding their desires behind a smokescreen of abstruse math and torrents of words.

Or maybe we're already there; consider

Complexity and the Art of Public Policy: Solving Society's Problems from the Bottom Up

By David Colander and Roland Kupers

310 pp.; Princeton University Press, 2014

the Affordable Care Act. MIT economist Jonathan Gruber did a great deal of highly complex analytical work purporting to optimize our health care system. After examining how numerous mandates and prohibitions would affect the various parts of the system, he then made further adjustments for those effects. His research was incorporated into the mountainous 2010 legislation that, Gruber admitted, could only be "sold" to the voters through statements of doubtful veracity. This law has led to huge distortions in the market and serious problems for many individuals.

Did Gruber not do his complexity analysis correctly? Or, is it perhaps the case that

there are too many unknowns for anyone to "solve" the nation's health policy problems, just as there were too many unknowns for Soviet economic planners to solve the problem of optimal resource allocation? In any event, I think we need to be wary of anyone who claims to have devised ideal new public policies based on his uniquely deep understanding of how complex our problems are.

Twenty years ago, Richard Epstein wrote a marvelous book entitled *Simple Rules for a Complex World*. Colander and Kupers never mention it, but comparing Epstein's case for the simple rules of the common law (e.g., contract, property, tort) with the Pandora's Box that complexity theory and nudging

would open, I remain strongly inclined toward Epstein's view that the legal system and public policy should remain simple.

In the end, the argument Colander and Kupers make for a new way of doing public policy that revolves around "complexity" analysis and governmental nudges leaves me worried. While the authors say they don't want government top-down planning to rule the economy and our lives, I fear that their ideas, if taken seriously, would be useful to those who do.

Or maybe I'm worrying for nothing. After all, Colander entitled one of his earlier books *Why Aren't Economists as Important as Garbagemen?* **R**

Working Papers ⟷ BY PETER VAN DOREN

A SUMMARY OF RECENT PAPERS THAT MAY BE OF INTEREST TO *REGULATION*'S READERS.

Minimum Wage

"Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," by David Card and Alan B. Krueger. *American Economic Review* 84, no. 4 (September 1994): 772–793.

"The Economic Effects of Mandated Wage Floors," by David Neumark. Public Policy Institute of California Occasional Paper. February 2004.

"Minimum Wages and Employment: A Review of Evidence from the New Minimum Wage Research," by David Neumark and William Wascher. November 2006. NBER #12663.

"Minimum Wage Effects across State Borders: Estimates Using Contiguous Counties," by Arindrajit Dube, T. William Lester, and Michael Reich. *Review of Economics and Statistics* 92, no. 4 (November 2010): 945–964.

"Do Minimum Wages Really Reduce Teen Employment? Accounting for Heterogeneity and Selectivity in State Panel Data," by Sylvia A. Allegretto, Arindrajit Dube, and Michael Reich. *Industrial Relations* 50, no. 2 (April 2011): 205–240.

"Revisiting the Minimum Wage-Employment Debate: Throwing Out the Baby with the Bathwater?" by David Neumark, J. M. Ian Salas, and William Wascher. January 2013. NBER #18681.

"Effects of the Minimum Wage on Employment Dynamics," by Jonathan Meer and Jeremy West. August 2013. NBER #19262.

"Who Benefits from a Minimum Wage Increase?" by John W. Lopresti and Kevin J. Mumford. April 2015. SSRN #2590346.

T he recent ruling by a New York State labor commission to increase the minimum wage for fast-food-chain workers to $15 an hour has revived interest in economists' conclusions about the employment effects of minimum wage

increases. In this review I provide a summary of the papers I have found most useful.

Prior to 1992, the consensus was that an increase in the minimum wage reduces employment among those making between the old and new minimum levels. Research indicated that a 10 percent increase in the wage would reduce employment among affected workers by 1–3 percent.

In a series of papers published between 1992 and 1994, David Card and Alan Krueger (both of whom were then at Princeton University; Card is now at the University of California, Berkeley) explored the effect of an increase in the minimum wage in New Jersey on fast-food employment relative to neighboring Pennsylvania, whose minimum wage did not increase. They concluded that the increase did not reduce employment in New Jersey.

Two of the first stylized facts one learns in economics are that prices matter and the demand curves slope downward. Those facts mean that a legally mandated wage increase should result in less employment. So how could Card and Krueger have found no effect? In 2004, David Neumark (then at Michigan State University and now at the University of California, Irvine) argued that a combination of measurement error in the telephone survey used by Card and Krueger and the fact that the wages of many of the workers were already above both the new and old minimum wage accounted for their findings. Neumark also argued that for those workers who remained employed, the minimum wage is not a very effective anti-poverty instrument because only 20–30 percent of low-wage workers live in poor households. That is about the same percentage of minimum wage workers who live in households with incomes *three times above* the poverty level. And, ironically, the higher minimum wage reduces school and job training enrollment

because workers can achieve higher wages with less schooling.

In 2006, Neumark and William Wascher (Federal Reserve) published a long review of the post-Card-and-Krueger minimum wage research and concluded that while some studies supported the findings of no employment effect, the longer and (in their view) methodologically better studies concluded that the combination of the Earned Income Tax Credit and increased minimum wage had very negative employment effects for minority teenagers. Because the price of their employment went up, employer demand for them decreased, while the pool of substitutes (predominantly older, low-skilled women) increased because of the EITC.

Subsequently, a 2010 paper by Arindrajit Dube (University of Massachusetts, Amherst), William Lester (University of North Carolina, Chapel Hill), and Michael Reich (Berkeley), and a 2011 paper by Sylvia Allegretto (Berkeley), Dube, and Reich argued that Neumark and Wascher's conclusions were flawed. According to the authors of these papers, Neumark and Wascher used inadequate statistical controls for what would have happened to employment if there had been no increase in the minimum wage. The 2010 paper compared restaurant employment in counties across state borders that had different minimum wages, and did not find any negative employment effects. The 2011 paper argued for the inclusion of regional or state employment trends over time so that the employment trend in a state with a minimum wage increase would be compared to the trend in a state without an increase. When those trends were included as control variables, the authors found no negative employment effects in states that increased their minimum wage.

In 2013, Neumark, Ian Salas (then a doctoral student at Cal-Irvine; now a postdoctoral fellow at Harvard University), and Wascher responded with a new analysis that included consideration of subtle but important econometric issues. The authors argued that the 2010 and 2011 papers failed to consider the effects of the early 1990s recession and the Great Recession on state employment time trends. The two recessions each altered the trend, but the 2010 and 2011 papers used linear trends. That means that their assumed "status quo" employment levels were, at various points of the business cycle, either above or below what a more careful assumption would have been. When the authors used a time trend that, they believe, more accurately represents the breaks and changes in the state-specific trends, the negative effect on teenage employment reappeared.

Neumark, Salas, and Wascher also took issue with the 2010 paper's assumption that adjacent counties divided by state borders are similar enough that one can conclude that a change in the minimum wage, rather than some other factor, is the cause of any observed employment differences. Said differently, the question is whether counties separated by state borders are more or less similar and thus that a search for correlation between minimum wage increases and restaurant employment requires fewer explicit control variables. Neumark, Salas, and Wascher estimate restaurant employment regressions for all counties and border counties and conclude that the prediction errors using border counties are worse than the prediction errors from randomly chosen counties. Thus border counties do not provide good controls.

A completely different response to the 2010 and 2011 papers is found in a 2013 working paper by Jonathan Meer (Texas A&M University) and Jeremy West (then a doctoral student at Texas A&M; now a postdoc at MIT). They argue that changes in minimum wages do not cause an abrupt change in employment *levels*. Instead, higher minimum wages change employment *growth* because employers do not adjust quickly to the new wage by cutting work hours; rather, they adjust slowly. Thus the dependent variable in minimum wage studies should be employment *growth* rather than employment *levels*. This implies that the use of state employment time trends as controls in the 2010 and 2011 papers automatically attenuates the effect of the wage on levels of employment toward zero. If the difference in wages between states lasts long enough, the effect on employment levels of a minimum wage increase eventually would be negative, but the real-world differences in wages across states are never large enough for a long enough time period, and thus the effect on employment levels is difficult to differentiate from no effect. But the effect on the rate of growth in employment is immediate and much easier to detect. Meer and West conclude that a real minimum wage increase of 10 percent reduces job growth by 0.3 percentage points annually, or about 15 percent of the baseline level.

The final study I review, by John Lopresti (College of William & Mary) and Kevin Mumford (Purdue University), uses responses in the Current Population Survey from the same individuals one year apart over the time period 2005–2008 and compares the wages of those in states that experienced minimum wage increases with the wages of those in states that did not increase their minimum wage. The increases varied from 10 cents to $2.10 an hour. Those in states whose minimum wage increased by 5 percent or less whose wages were below $11 an hour experienced a *lower* wage increase (11 percent less) than if they had lived in a state whose minimum wage did not increase. (On the other hand, those in states that increased the minimum wage by 10 percent or more and had initial wages within 20 percent of the minimum wage experienced more wage growth.) The authors' explanation is that small minimum wage increases serve as focal points around which employers can tacitly collude.

High-Frequency Trading

"The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response," by Eric Budish, Peter Cramton, and John Shim. March 2015. SSRN #2388265.

No development in financial markets causes more discussion and disagreement than high-frequency trading (HFT). Forty years ago, the "making" of a market in equities was done by "specialists" who owned seats on exchanges.

They were compensated by the "spread"— the difference between the price they offered sellers and charged buyers. Those differences were large enough to more than cover costs. The excess profits were capitalized in the prices that specialists paid for the right to trade on an exchange.

Now liquidity is provided by traders using computers. In a previous column (Winter 2013–2014) I reported that many commentators view this change positively because the costs of trading have been dramatically reduced along with the rents to specialists. Bid-ask spreads have decreased over time and revenues to market-makers have decreased from 1.46 percent of traded face value in 1980 to just 0.11 percent in 2006. And HFT reduces stock price volatility. When the temporary ban on short sales of financial stocks existed in 2008, the financial stocks with the biggest decline in HFT had the biggest increase in volatility.

Those who emphasize the costs of HFT focus on the "arms race" among HFT participants to locate their servers closer and closer to the servers of electronic exchanges. This arms race exists because the transfer of buy and sell offers from any of the actual computerized exchanges to the National Market System (NMS) takes real time. This creates the possibility of learning about prices at a computerized exchange and trading

on that information through the NMS before the NMS posts the information. Traders have responded to these facts by paying to locate their servers in the same location as exchange servers, utilizing the speed of light to arbitrage price differences at the level of thousandths of a second.

Budish and coauthors demonstrate that this arms race is the result of exchanges' use of "continuous-limit-order-book" design (that is, orders are taken continuously and placed when the asset reaches the order's stipulated price). They use actual trading data to show that the prices of two securities that track the S&P 500 are perfectly correlated at the level of hour and minute, but at the 10 and 1 millisecond level the correlation breaks down to provide for mechanical arbitrage opportunities even in a perfectly symmetrical information environment. The investment in speed has reduced the duration of the arbitrage opportunities, but not their existence or profitability. In a continuous auction design someone is always first. In contrast, in a "frequent batch" auction design (where trades are executed by auction at stipulated times that can be as little as a fraction of a second apart), the advantage of incremental speed improvements disappears. In order to end the arbitrage "arms race," the authors propose that exchanges switch to batch auctions conducted every tenth of a second. **R**

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