BUSINESS

DISRUPTIVE TECHNOLOGIES,
MARKET STRUCTURE AND
COMPETITION IN
THE 21ST CENTURY

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The William J. O'Neil Center for Global Markets and Freedom was founded in 2008 with an initial grant from William J. O'Neil, a 1955 SMU business school graduate, and his wife Fay C. O'Neil. Its broad mission is the study of why some economies prosper and others do poorly. The center's programs promote understanding of how capitalism works among the general public, policy makers, business managers and the next generation of business leaders. To these ends, the O'Neil Center teaches SMU Cox students, conducts economic research, publishes economic reports, sponsors conferences and educates the public through the media and speeches.

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Dean Myers at the O'Neil Center's Texas Economic Forum

A Message from the Dean

One of our most important jobs at SMU Cox is to prepare students for the world in which they'll be living and working, rather than making them comfortable in the one around them. Taking that forward-looking view means thinking a lot about technology and its impact on just about everything in business and the economy.

We're not tech wizards at SMU Cox. What we understand is business. In the classroom, our professors teach the uses of technology in business operations and leadership in managing the challenges of rapidly changing enterprises. In their research, our faculty examine how market forces shape technology and the ways innovation surges through the economy.

That brings me to the O'Neil Center Annual Report essay in which SMU Cox researchers Mike Cox and Rick Alm write about how digital technology is driving change in the economy.

The focal point of Big Business: Disruptive Technology, Market Structure and Competition in the 21st Century is an intensifying bias toward bigger companies and more concentrated industries. It emerges from rapid progress in technologies related to the processing, transmission and storage of information.

Big companies are nothing new, of course, but Cox and Alm identify a different set of forces at work in today's business environment—the rise of industries producing with high fixed costs and low marginal costs. Traditional assumptions about market structure and competition may no longer hold, particularly as they relate

to matters of consumer welfare.

The essay gives us a lot to think about—just what I've come to expect from the O'Neil Center. Cox and Alm regularly make the impact of technology the centerpiece of their research. A few years ago, their essay on *The Imagination Age* described technology's pivotal role in driving American progress—from the constant toil of our agricultural roots to a future being forged by the possiblities opened by today's marvels.

The Annual Report concludes with a review of the O'Neil Center's activities and accomplishents for academic year 2018-19. You might notice a conference, speaker, forum or other program you wish you hadn't missed—so sign up for the center's email alerts. They'll keep you informed about what's on tap next year and beyond.

Matthew B. Myers Dean, Cox School of Business

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BUSINESS

DISRUPTIVE TECHNOLOGIES, MARKET STRUCTURE AND COMPETITION IN THE 21ST CENTURY

By W. Michael Cox and Richard Alm

Technology disrupts economies. It does so first by opening our minds to what's suddenly possible, then by changing how we produce and what we consume. The disruptions might arise from new goods and services or from improvements to existing ones. They might involve new tools for producing, new ways of organizing enterprises or new techniques for connecting with customers. Some disruptions send ripples through isolated pockets of the economy; others generate great waves that

sweep over its whole length and breadth.

In the past, the United States endured, adopted and then came to celebrate a series of epic disruptive technologies—the railroads' westward rush, the electrification of everyday life, the mechanization of industry, the endless permutations for transporting people and products, the harnessing of atomic power and the piercing of outer space. Today, the technologies doing most of the disrupting cluster under the digital umbrella. They include

semiconductors, computers, the Internet, wireless communications, increasingly complex software and other wonders that collectively enhance our power over information and knowledge.

All things digital have been dissected and scrutinized, praised and lamented for decades, but the subject at hand is a digitally driven *cost-side* revolution upsetting many traditional assumptions about the American economy. The most striking consequence of this cost-side transformation has been an

"The most striking consequence of this cost-side transformation has been an easing of once-accepted limits on the size of enterprises. Firms can now grow bigger before they exhaust the advantages of size, leaving many industries with fewer but bigger companies."

easing of once-accepted limits on the size of enterprises. Firms can now grow bigger before they exhaust the advantages of size, leaving many industries with fewer but bigger companies.

Obvious examples include the rise to prominence of Amazon, Facebook, Google,

Apple and a rejuvenated Microsoft. What's at stake, however, goes well beyond a handful of once-iconic technology giants now mired in controversies. The data suggest that the impulse to get bigger has become pervasive in the 21st century—extending even to services, retailing and old-line manufacturing.

For companies and their customers, the swing toward big business raises questions about pricing power, consumer welfare, profits, mergers and acquisitions, investing, corporate governance and the pace of innovation. For the economy, this new reality presents challenges for established views on growth, inflation, job creation and inequality. In the policy space, lawmakers and regulators confront unconventional

but complex issues of market structure and competition, including the relevance of accepted antitrust doctrine.

U.S. capitalism featured outsized companies since the heyday of John D. Rockefeller and Andrew Carnegie. Some Americans honor the early industrialists as nation-builders while others decry them as robber barons—a clash that reflects the nation's long-standing ambivalence toward big business. Benign or malign? The question lingers into the 21st century, with the current, digitally inspired incarnation of big business offering its own mix of benefits and liabilities.

The movement toward larger and more concentrated industries represents another momentous transformation of the U.S. economy, one that's likely to intensify in years to come as digital technologies grow ever more powerful and penetrate deeper into the economy.

Disruptive Technologies and Costs

The story's been a part of Dallas lore for generations—a young Texas Instruments researcher named Jack Kilby, left largely on his own in his lab during the summer of 1958, developed the core technology of the digital economy. Perhaps most significant, U.S. Patent 3,138,743 for miniaturized electronic circuits, granted in 1964, planted the seed for invention of the microprocessor seven years later.

Fast-forward four decades: The tiny brains forged from plastic, copper and silicon are powering today's digital world—from computers and smartphones to the Internet and wireless networks. These basic

inventions have been part of our lives for a while, but the cost-side revolution didn't shift into high gear until breathtaking advances expanded the horizons for technologies that process, transmit and store information.

Computers had to achieve enough processing power to run massive software packages in just seconds. Great leaps in chip design have given today's computers almost 2.6 million times more processing power, measured in megahertz, than the machines

of the mid-1970s (see Exhibit 1, top left).

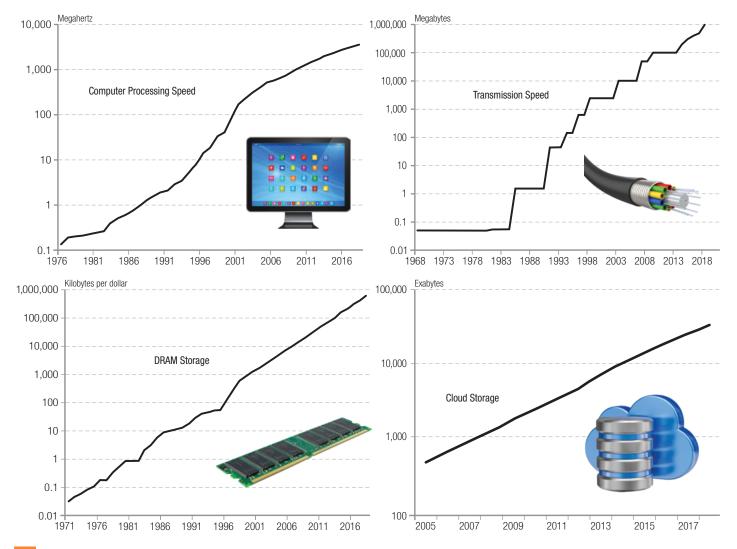
The tentacles connecting computers required enough bandwidth to move huge amounts of information around the globe at the touch of a keystroke. Since the Internet came into everyday life in the 1990s, the megabytes of data that can move through cyberspace in one second increased by a factor of 650,000 (top right).

Last but not least, storage capacity had to become vast enough to accommodate the mountains of information needed to



Technology Drives a Business Revolution

Computer chip- and Internet-based technologies are driving a business revolution by making it cheaper to process, transmit and store data. They've been spurred by advances in computers' capacity to handle more complex operations (top left); faster Internet connections that allow more data to move about the world (top right); and expansion in information storage capacity, both in conventional chips (bottom left) and the cloud (bottom right).



keep the modern world humming. When it comes to kilobytes of conventional DRAM storage, a dollar today will buy 200 million times what it could in the early 1970s. In the past decade or so, storage took another great leap with cloud computing; its capacity in exabytes increased 64-fold in just 13 years (bottom left and right).

As impressive as they are, these testaments

to raw power don't capture the full import of the cost revolution. Even more important is what these epochal digital advances did for costs. Processing, transmitting and storing information became cheap—so cheap, in fact, that in many cases it's now something of a commodity. It's the plunging costs that give today's digital technologies their immense power to disrupt.

Understanding digital technologies' role in spurring big business requires a few lessons on costs. Stick with us for a moment as we introduce some economic jargon—we'll be quick about it (see Box 1).

Fixed costs are expenses that don't vary with the quantity of a firm's output. Traditionally, they include money to set up operations, such as building factories and

Box 1

A Different Slant on Supply and Demand

Supply and demand diagrams became a staple of economics after publication of Alfred Marshall's influential textbook *Principles of Economics* in 1890. Demand curves slope downward and supply curves slope upward in a price (P) and quantity (Q) space—at least that's the way it's almost always drawn in the classroom.

The shapes of the two lines reflect the fact that consumers want more at lower prices, but producers are willing to sell more only at *higher* prices.

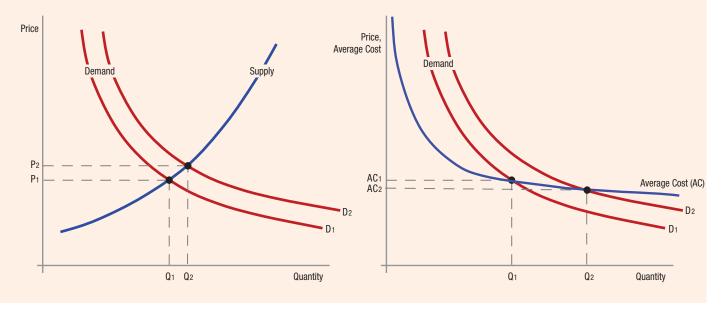
This simple view of supply, however, only applies to perfectly competitive markets with a large number of firms, each producing an identical product. No firm can influence prices; no barriers block the entry of new competitors in response to excess profits. An increase in demand summons more output and raises prices (*left chart*).

If any one of the perfect competition conditions isn't met, the industry supply becomes a complex interaction among consumer demand, firms' production costs, the prices and substitutability of all competitors' products and the response of each firm to the actions of actual or potential rivals.

Simple P and Q supply curves don't exist apart from perfect competition, and, perfect competition rarely exists in the real world. Nevertheless, it's useful to think about the interaction between P and Q in markets without perfect competition.

What if very high fixed costs and very low marginal costs characterize a product's supply? The firm can then reduce average product cost by making and selling more. In this world, an increase in demand has the potential to raise Q and *lower* P (right chart).

That's what we observe in an increasing number of industries today: Using lower prices and improvements in product quality, firms vie for customers in an effort to reduce unit costs, gain market share and increase their market power and profits. It's as if there's a supply curve that slopes downward, a radical departure from the conventional view of an upward-sloping supply curve.



"Today, we see a proliferation of industries producing under conditions of high fixed costs and low marginal costs, centered on goods and services with a high degree of information or some form of knowledge as a primary input."

equipping them with expensive machinery. Three aspects of fixed costs are particularly relevant in today's digital economy: First, they're more likely to involve intellectual property—what companies know how to do. Second, the burden declines when spread over a larger and larger number of customers. Third, high fixed costs often serve as a barrier to entry that keep potential competitors out of an industry or market.

Marginal costs measure the expenses required to produce each additional unit or serve another customer. They include outlays that increase as companies ramp up production, such as payments for labor and raw materials.

Traditional notions of marginal costs emerged from industrial capitalism, which from its very beginnings exploited increasing returns to scale to produce goods at lower average cost. The physical nature of factory production, however, entailed limits on how long marginal costs could continue to decline. Enterprises could only get so big before inefficiencies sent marginal costs upward again, reaching a point where returns to scale switch from increasing to decreasing. After that, profits start to fall.

With digital technologies, companies no longer bump up against the same cost constraints as factory producers. Instead of turning upward at some point, marginal costs stay low or even continue to fall out to the relevant horizon. The increasing returns to scale that apply to the next customer might extend to the next million customers and the million after that.

Today, we see a proliferation of industries operating under conditions of *high fixed costs* and *low marginal costs*, centered on goods and services with a high degree of

information or some form of knowledge as a primary input.

Conceptually separate, fixed and marginal costs work hand-in-hand. High fixed costs discourage new entrants. Sheltered from the threat of competition, a company facing low marginal costs has plenty of room to expand its customer base. As companies grow larger, they spread the fixed costs over more and more paying customers while continuing to reap the rewards of low marginal costs. The result is falling average costs over an extended range of output.

This is the new reality forged by the digital age's disruptive technologies. Because of it, the bigger the better becomes the best strategy for growth and perhaps for survival. The combination of high fixed costs and low marginal costs favors an industrial structure with a few dominant producers—most of them big, all with large shares of the market.

Trending Toward Bigness

Digital technologies enable the growth of the high-fixed-cost, low-marginal-cost business model because of the growing importance of information and knowledge. They're intangible rather than physical and prohibitively expensive unless spread over a large customer base.

A good example is the microprocessor itself, the invention that started it all. A fully automated wafer-fabrication plant may require a \$10 billion-plus investment. Developing each generation of new chips involves the specialized talents of highly paid engineers and programmers. These costs—and others—are paid before even one microprocessor can be shipped to customers.

Due to high fixed costs, producing one chip would be god-awfully expensive. Nobody could afford it, but the unit cost gets steadily cheaper as output climbs into the millions or billions. At this point, the truly miraculous happens: computer chips now costing pennies cascade through the economy, becoming inputs for myriad electronic devices and spreading declining average costs into one industry after another.

A few big companies dominate the semiconductor industry, with the market share of the four largest firms accounting for 42 percent of sales (see Exhibit 2). Personal computers, collectively a big buyer of semiconductors, show an even greater degree of industry concentration—Hewlett-Packard, Dell, Lenovo and Apple control 80 percent of the market.

Nationwide cellular networks can't operate without transmission towers, satellites, switching software and more—all fixed costs profitable companies spread over millions of customers. Among wireless carriers, Verizon and AT&T control 69 percent of the market; adding T-Mobile and Sprint brings the four-company market share to 99 percent.

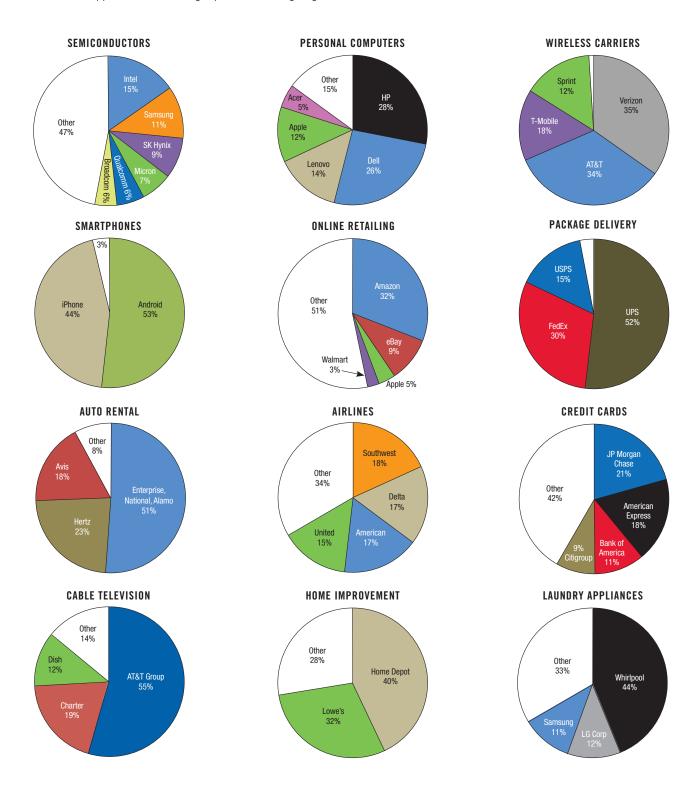
After paying to develop the software for smartphones, Apple's iOS and Google's Android end up splitting 97 percent of the market. To nobody's surprise, Amazon dominates online retailing, and the sector's four largest competitors combine for nearly half of all sales in what's become a rapidly growing market.

Inexpensive package delivery is fundamental to the business models of Amazon and all other online retailers. To serve these distribution channels, UPS and FedEx invested billions in transport and



Fewer Firms Dominate in a Dozen Industries

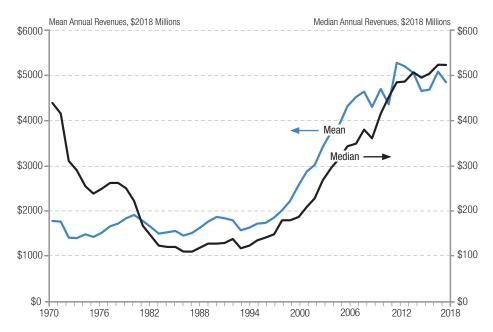
Some of these businesses are creatures of the digital revolution—semiconductors, personal computers, wireless carriers, smart phones and online retailing. In addition, networking stalwarts are using new technologies to turbocharge their businesses—package delivery, cable television, airlines, auto rentals and credit cards. Even home improvement and appliances are finding top firms claiming large shares of revenues.





The Thrust Toward Bigness

Measured by either mean (blue line) or median (black line) revenues, publicly held companies have been growing larger since the mid-1990s. The trend's start coincides with the adoption of increasingly powerful digital technologies that expand the capacity to process, transmit and store information.



communications networks that facilitate deliveries from all over the world to nearly anyone's doorstep—at an affordable price. As volume grows, the average cost of delivering each additional package shrinks, so the industry's two dominant giants are big enough to command 82 percent of a market once ruled by the U.S. Post Office.

Package delivery has corollaries in other businesses based on transport networks. Whether its automobiles or airlines, using fixed assets more intensively—keeping them in motion—pays off in lower average costs. Consolidation in recent decades pushed the market share of the top three auto-rental companies to 92 percent and the top four airlines to 66 percent.

Credit cards represent another type of network business. As with airlines and car rentals, credit-card issuers require a lot of customers to pay the cost of establishing and maintaining globe-girdling payment networks. Four big banks take almost 60 percent of the market.

Enlarging audiences to pay for expensive

entertainment programming has been basic to broadcasting since the early days of radio and television. Until two generations ago, three networks ruled the business. In an era of channel proliferation, three companies divvy up 86 percent of all revenues from U.S. households with cable television.

The digital transformation in costs affects even decidedly non-high technology industries. Old-line brick-and-mortar retailers, for example, are using scanners and software to streamline inventory management and speed up customer checkouts. In the home improvement and hardware sector, Home Depot and Lowe's have used size to achieve a combined 72 percent market share.

For a generation or two, manufacturing companies have pushed factory automation, including robotic assembly lines. These technologies are expensive; once up and running, however, they drive down costs as operations get bigger—so fewer producers, churning out cheaper goods in higher quantities, meet market demand for

washing machines and clothes dryers.

A dozen examples can only be suggestive. Verifying a broad trend toward bigger and more concentrated requires a larger swath of the U.S. economy. First, regarding the issue of size. From 1970 to 1997, the mean annual revenues of U.S. publicly held companies were relatively flat, oscillating between \$1.4 billion and \$1.9 billion, adjusted for inflation (see Exhibit 3).

Then something notable happened—at about the same time as the increasingly powerful digital technologies began penetrating the U.S. economy. Mean annual revenues began to grow year by year, exceeding \$5 billion in 2012 and not falling below \$4.6 billion in any year since. Median size shows the same timing and upward thrust, indicating the result wasn't a matter of just a few already big companies getting bigger.

Now for the second part of it—greater concentration. The Census Bureau's indepth survey of U.S. industries, conducted every five years, provides data for comparing market concentrations in 1997 and 2012, a sufficiently long interval to detect general movements in industry consolidation.

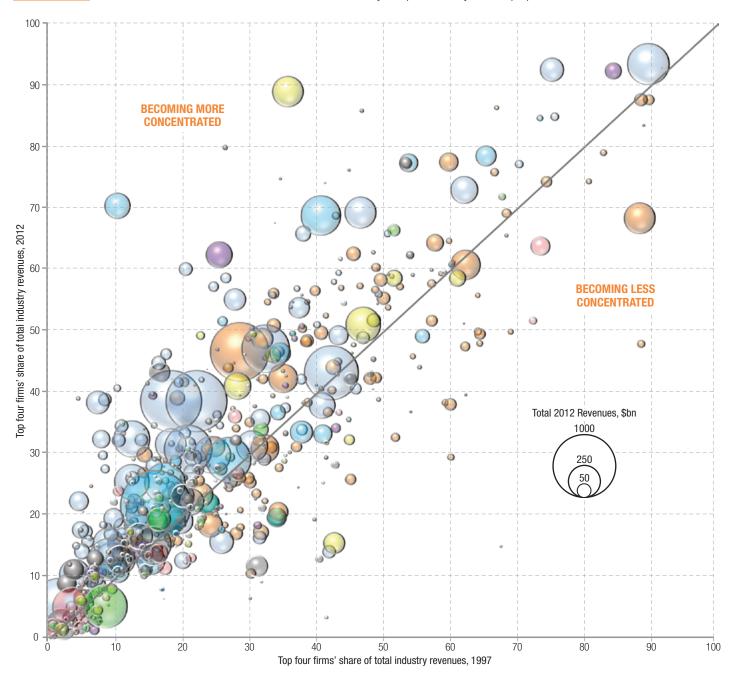
Some industries grew less concentrated, but many more saw their top four companies get bigger and increase their market share (see Exhibit 4). Growth and consolidation shook up the telecom industry, which had a sixfold increase in overall revenue while a wave of mergers pushed the four largest companies' market share from 36 percent in 1997 to 89 percent in 2012. The same story unfolded in a wide swath of industries. For airlines, total revenues experienced a tenfold jump, and a thinning of the ranks helped the big four's market share rise by 37 percentage points. For software publishers, revenues grew 200 percent and the top companies saw market share rise from 28 percent to 41 percent.

Amazon and other online sellers took business away from bookstores and news dealers. As a result, the brick-and-mortar businesses saw sales shrink 3.1 percent.



Not Just Bigger—but More Concentrated Too

In economics, one accepted gauge of market concentration is the combined share of industry revenue claimed by its four largest companies. Data on 562 U.S. industries reveal a trend toward greater dominance by top companies from 1997 to 2012—i.e., more industries are moving upward and to the left relative to the 45-degree line that separates more market concentration from less. Related industries are the same color. Each industry is represented by a circle proportional to its size.



However, bankruptcies and mergers pushed the four-firm concentration ratio from 50 percent in 1997 to 66 percent in 2012. The insurance industry, by contrast, expanded revenues by a healthy

50 percent, but its big-four market share remained just above 55 percent despite some companies' aggressive online marketing campaigns.

The data speak clearly. Industries with

bigger firms and greater concentration are becoming more common. The trend has already begun to generate significant changes that impact businesses, consumers, the economy and economic policy.

"Declining costs associated with increasing returns to scale may give companies room to permanently lower prices, but the winning strategy in oligopolies will more likely center less on prices and more on product quality and marketing."

The Age of Oligopoly

Economics adopted a Greek word to describe a market structure dominated by a small number of big companies oligopoly, literally meaning "few sellers." The conventional big-picture verdict is that oligopoly yields outcomes that aren't as good as those arising from competitive markets but not as bad as those produced by monopolies.

It's not that black and white. Oligopoly changes firms' behavior and objectives, sometimes in subtle ways. Perhaps most importantly, the market structure sets up a chess game of sorts, with one company's next move depending on judgments about how its identifiable competitors will respond and how it responds to that next move.

Take a company considering a price hike. If the rest of the industry follows suit, it may work out well in terms of revenues and profits. If competitors keep prices the same, the company risks losing market share, sending its revenue and profits careening downward. When launching a new model or marketing campaign, the bottom-line impact will depend on how quickly and effectively rivals make their countermoves. In short, outcomes are unpredictable. For any firm, finding the revenue-maximizing price and quantity is tantamount to taking aim at an array of moving targets.

A few companies huddling behind closed doors might resolve all this uncertainty by agreeing to carve up markets and set stable, high prices. This kind of collusion is the prime worry about oligopolies, and these tactics are by and large illegal in the United States. The Federal Trade Commission and other agencies are charged with keeping a close watch.

When companies can't collude, they're

forced to compete, and oligopolies often foster ferocious Coke v. Pepsi competition. The perpetual chess matches are a search for meaningful advantage over rivals, for some market power to exploit. The quest drives companies to innovate, enticing customers with new designs, new features, new accessories and even entirely new product lines. Apple's genius involves combining incessant innovation that produces sleek, ingenious gadgets with relentless marketing that makes them iconic.

Oligopoly confers pricing but companies are wary of using it too aggressively. The restraint comes partly from knowing the feds are watching, but pricing miscalculations—charging too much or too little-court potential trouble on either market share or profitability. In the 1980s and 1990s, for example, the airlines' price wars took a toll on all companies and pushed the weakest toward merger or bankruptcy.

Declining costs associated with increasing returns to scale may give companies room to permanently lower prices, but the winning strategy in oligopolies will more likely center less on prices and more on product quality and marketing. Stable prices allow revenues to grow and margins to increase as high fixed costs spread over more customers. Getting bigger and bigger stands out as the best strategy for increasing both revenues and profits.

The evidence suggests big companies have been posting outsized profits during the period of increasing company size and market concentration. Among firms with more than \$1 billion in revenue, return on invested capital had been stable at around 10 percent for four decades before shooting up to 16 percent in 2007. After a dip during the Great Recession, returns bounced back to 16 percent through 2013 (see Exhibit 5). By comparison, average profits across companies of all sizes show no increase that can't be attributed to the added earnings of big businesses.

An increase in industry's overall size will make most companies bigger, some more than others. Otherwise, gains in relative size usually entail taking market share away from incumbents. It can be done in the trenches, vying for one customer at a time. A faster way to grow market share involves gobbling up competitors or buying strategic assets through mergers and acquisitions.

A \$180 billion telecommunications and entertainment behemoth grew out of a string of deals: In 2005, a regional telephone company called Southwestern Bell bought AT&T, taking its name, then added BellSouth, Ameritech and Pacific Telesis. In 2015, the company added DirecTV and two years later made its foray into entertainment with a \$109 billion deal for Time Warner.

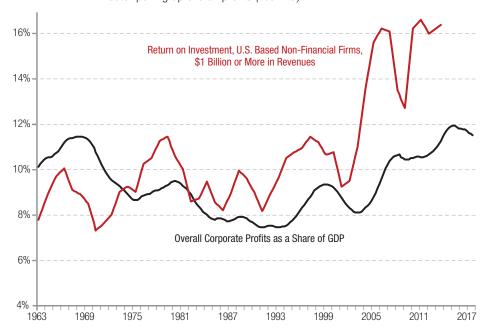
High fixed costs serve as barriers to entry, protecting an oligopoly's incumbents from emerging new competitors. Being sheltered gives pricing power, and it helps grow revenue faster and earn above-average profits. With so much at stake, it's not surprising that companies in concentrated industries seek to defend their privilege, perhaps by making sure prices and profits don't get exorbitant, perhaps by currying favor with politicians and lobbying for regulations to shore up existing barriers.

Despite these efforts, concentrated markets can become contestable—ripe for attacks from new competitors. The impetus might be the same digital technologies that set up the chase for lower costs. Traditional cable companies have seen their dominance shaken by the emergence of Netflix, Hulu,



Bigger Business, Bigger Payoff

Average corporate profits as a share of GDP have been rising in the past decade or so (black line). The faster growth of average investment returns for the biggest U.S.-based non-financial companies suggests they've been one factor pulling up overall profits (red line).



Amazon Prime, Sling TV and other startups that deliver movies and entertainment via the Internet. Incumbents adapt, so cable might not just go away.

Foreign companies often make markets contestable. General Motors, Ford and Chrysler once dominated U.S. auto sales, but they failed to deliver for consumers on price and quality. Today, more than a dozen firms vie for market share in U.S. car market more open to non-U.S. brands.

Big companies prosper in big markets, so globalization plays a key role in increasing the size of enterprises. Pharmaceutical companies, for example, face high fixed costs for developing new drugs but then low marginal costs for producing them. The industry's low costs mean firms can profit by expanding sales all over the world, even where governments cap drug prices.

Consuming Interest

Americans love their smartphones. Nine of 10 of us keep ours within arm's length at all times. Small enough to fit in a pocket or purse and linked to the world by the Internet, these clever devices are light years beyond the mobile telephones that came onto the market just a few decades ago.

The first brick cell phone sold for \$4,195; it made calls but only occasionally and took 10 hours to charge. That ancient technology was expensive and inefficient because it had relatively few customers to shoulder the burden of the industry's high fixed costs (see Exhibit 6, top). A used iPhone 8—perfectly functional but without the bells and whistles of Apple's newest model-might sell for as little as \$250 in 2019. Why are today's phones so much cheaper? It has a lot to do with the 2.5 billion users worldwide now paying a share of the fixed costs.

Today's smartphones still make calls, but they also replace dozens of gadgets consumers once bought separately—clocks and watches, calculators, still and video cameras, answering machines, address books, tape recorders, iPods and other

portable music players, small flashlights, maps, GPS devices and more. Buying all these things separately might cost a typical consumer more than \$5,000.

highlight Smartphones an underappreciated aspect of a high fixed cost, low marginal cost world. Consumers get plenty of benefits, often paying surprisingly little for goods and services that are worth a lot to them. The Internet serves up a cornucopia of free stuff-Google searches, email and YouTube videos, to pick just three examples. phones eliminated long-distance charges decades ago.

Apps are software packages, costly to develop but inexpensive to replicate and distribute. More than 6.5 million are available, some for free, others for just a few bucks. Access to Netflix's offerings starts at \$9 a month. Uber charges less than taxis in most cities. Don't want to go out for dinner? A service will deliver restaurant meals to your door for a fee smaller than the waiter's tip would have been.

Amazon's virtual mall offers consumers a world of variety, convenience and low prices. Software drives down transaction costs by connecting buyers and sellers (See Box 2). The sharing economy turns spare bedrooms and hobbies into income-earning assets.

The digital revolution's cheap computing power has made many modern household products more affordable, even for lowincome households. Ownership rates have reached 98 percent for cell phones, 95 percent for DVD players, 84 percent for computers, 81 percent for the Internet and 74 percent for smartphones.

And progress is coming faster. A third of U.S. households had personal computers 16 years after PCs hit the market. Internet access reached a third of households in eight years, and it took just five years for smartphones (see Exhibit 6, bottom). Raise the threshold to two-thirds of households, and the figures rise to 22 years for computers, 16 years for the Internet and seven years for smartphones. By comparison, the products of earlier periods took far longer to spread into households, largely because previous



Benefits for Consumers

Cell phones epitomize the consumer gains from a world of high fixed and low marginal costs. Early devices had limited capabilities and cost a lot to buy, largely because a small number of customers paid the fixed costs. Over time, cell-phone prices fell as the customer base multiplied, and new features like cameras and calculators reduced the need for users to buy separate devices. Digital technologies help reduce the real prices for many popular products, speeding up their spread into households *(table)*.

1984: \$4195 91,600 owners



2019: \$250 2.5 billion owners



If bought separately: \$5,000



Before and After the Digital Dawn

Product and First Year of U.S. Household Ownership		Number of Years Until Household Ownership Exceeds		Product and First Year of U.S. Household Ownership		Number of Years Until Household Ownership Exceeds	
		33%	67%			33%	67%
Electricity	1882	38	47	Microwave Oven	1973	12	15
Telephone	1892	27	61	Personal Computer	1979	16	22
Electric or Gas Stove	1893	35	55	Internet Access	1991	8	16
Automobile	1896	26	59	Digital Camera	1997	7	10
Washing Machine	1908	48	66	DVD Player	1997	6	8
Air-Conditioning	1946	24	43	Digital Video Recorder	1998	9	11
Dishwasher	1950	25	60	Smartphone	2007	5	7

technologies driving progress couldn't reduce production costs and prices as quickly as today's digital technologies.

Gains in consumer welfare are a direct consequence of the declining average cost made possible by digital technologies, pushed along by the incentives they create for companies to get bigger by selling to more customers.

Changing the Economy

The U.S. economy has been sending out mixed signals. Soaring stock prices and record-low unemployment evoke boom times, while growth rates for GDP, productivity and wages suggest a leaden economy not measuring up to past performance. The disruptive technologies

help resolve this apparent conundrum.

GDP and other statistics fit an industrial economy with easily quantifiable output and prices that reflect worth to consumers. The smartphone example—get far more, yet pay far less—shows we no longer live in that world. Those products selling for \$5,000 made redundant by a \$250 iPhone? Not buying them meant a *decline* in measured

GDP, even though smartphone owners are better off. All over the economy, cheaper processing power, transmission speeds and storage capacity have widened gaps between what consumers pay and the worth to them of what they buy.

Calculated every quarter, measured GDP has become less reliable as a gauge of how well the economy's doing-how much less reliable, it's impossible to tell. The evidence on ownership and other data show that the digital economy has been delivering far more progress than the GDP numbers reveal.

The past decade's remarkably low inflation surely owes something to all those companies getting bigger by taking the path of high fixed, low marginal costs. At the same time, price competition has become more intense, with the Internet and cell phones making shopping for the lowest prices quick and easy.

The durability of the current upswing hints at the economy's hidden strength. An expansion that started in June 2009 reached its 124th month in October 2019, making it the longest in history (see Exhibit 7, top). A

weak economy beset by inflationary storms wouldn't have made it this long without slipping into recession.

Big companies bring stability to an economy. They're less likely than startups to go belly-up. They've got enough resources to withstand occasional fallow periods without laying off workers. They generate healthy profits to innovate, expand and buoy the stock markets by rewarding shareholders.

What big companies don't do is create a lot of jobs—not necessarily a huge problem these days with unemployment so low. The digital economy runs on information and knowledge, and today's companies are hiring fewer workers per dollar of output than oldline manufacturers.

When these big companies do add workers, the jobs often go two ways-to low-paid employees for packing and shipping and to highly educated researchers, product designers and marketers. The bifurcated labor force doesn't offer much hope for reversing a long trend toward increasing income inequality that began at the time

the microprocessor was invented (see Exhibit 7, bottom). By muddying economic data and offering little hope on such issues as inequality, the trend toward high fixed costs and low marginal costs means added challenges for economic policy.

Puzzles for Policymakers

A rush toward bigness arises for the most part from technology-driven market forces rather than connivance among companies who should be competing. Consumers love smartphones and the other diversions big companies produce. Traditional data are becoming less useful as a guide to the economy. The problems of jobs with low pay and rising inequality aren't likely to get much help

This much should be clear about economic policy today and going forward—it's not going to get any easier. The Federal Reserve, for example, can't just follow rules of thumb left over industrial times. It has to recognize the economy might be doing better than

Box 2

It's Not All about Getting Bigger

Today's digital economy helped make the likes of Amazon and Facebook into tech titans—but the story of these revolutionary technologies doesn't end there. Cheap computing power, faster communications and smarter software are opening new possibilities for individuals and small enterprises.

Workers are earning a little extra money taking flexible jobs in the gig economy. Houses, cars and hobbies generate ready cash in the sharing economy. Computers and cell phones just might be all that's needed to launch a microenterprise. A new marketing profession-it's called influencer-arose in the cauldron of social media.

What's at work here is old-fashioned economics set in perpetual motion by digital technologies. Inexpensive computers and mobile connectivity are lowering the costs of starting a business, knocking down the financial barriers to entry that once stifled many good business ideas. The costs of printing business cards might be the only out-of-pocket expenses for a one-person company that operates virtually using already owned electronic devices.

Software makes it cheaper and easier for buyers and sellers to find each other, reducing the high transaction costs that once prevented many mutually beneficial exchanges. The Internet reduces the role of traditional middlemen and brokers, those often-expensive facilitators, and adds a measure of safety and trust through online reputations.

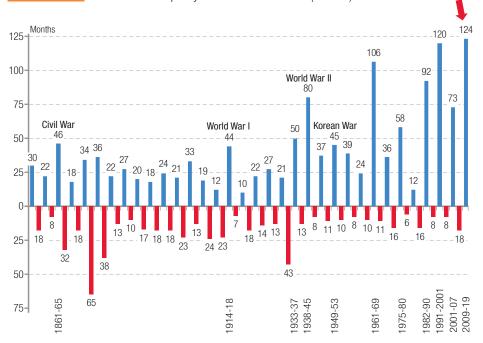
Entrepreneurs identify opportunities and devise ways to profit from them. Many fail. Some succeed. Drones have become cheap and easy to use, and insurance companies are hiring free-lancers with drones to inspect for roof damage after storms.

A few peripherals and apps convert a teen-ager's bedroom into a home studio for producing online content. High-speed video connections hook tutors in one country up with students in another one. A single 3D printing machine and a cell phone are enough to create a new business turning computer code into physical objects, maybe working in the garage.

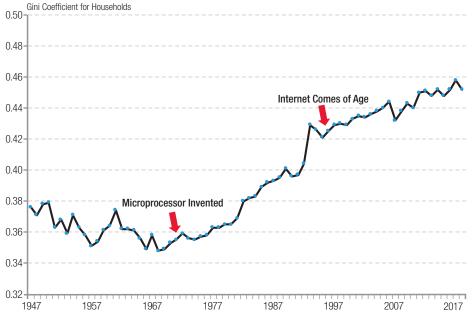
EXHIBIT 7

More Stability, Less Equality

The arrival of digital technologies coincided with a long period of growth and stability, including a 10 year-plus expansion, the longest in history *(top)*. At the same time, Gini coefficients have been rising steadily, pointing to greater measured inequality in household incomes *(bottom)*.



Measured Inequality in a Time of Technological Upheaval



measured GDP indicates; at the same time, it's an economy that can hit higher speeds before stirring up inflation. Interest rates can probably stay lower for longer—but does that court market bubbles and other

risks that might increase instability?

Not all that long ago, tech giants Amazon, Facebook, Google and Apple stood out as exemplars of American capitalism's innovative spirit. Times sure have changed; today, these big, high-profile companies are the target of slings and arrows over such issues as privacy, misusing customer data, lax controls on malicious political propaganda and, perhaps most ominous, anticompetitive business practices. In July 2019, the Justice Department's Antitrust Division launched an investigation into whether the four companies reduced competition, stifled innovation or otherwise harmed consumers.

Antitrust issues are destined to arise from the trend toward bigger companies and more concentrated industries. The nation's basic laws in this arena were written for an industrial era, with the main goal of preventing big companies from harming consumers by price gouging. In the digital age, however, consumers are in many instances the conspicuous beneficiaries of big companies—so antitrust action might make the public worse off, a curious twist.

Beyond consumer welfare, size might lead to unfairly obstructing rivals or stifling competition by purchasing promising startups. Another thorny issue is the matter of remedies. Many of the digital economy's companies exist in the Internet's ether, and they mutate constantly, raising questions about a geography-based breakup or regulations that target current business practices.

The digital economy's policy conundrums might even bring up concerns as fateful as the sustainability of capitalism. Even if they give us such wonders as smartphones, big companies earning fat profits aren't sympathetic heroes for the growing number of Americans asking their capitalist system for more than material progress. The resentments that feed the anti-capitalist mindset lead straight to misguided populist policies that prevent businesses from realizing the opportunities forged of digital disruption. The nation can't prosper if it rejects technology's gifts.

W. Michael Cox is founding director of the William J. O'Neil Center for Global Markets and Freedom (wmcox@smu.edu). Richard Alm is writer in residence at the center (ralm@smu.edu).

Notes and Data Sources

Exhibit 1: Technology Drives a Business Revolution

Computer processing speed: 1976-79 data are from E. R. Berndt, E. R. Dulberger, and N. J. Rappaport, "Price and Quality of Desktop and Mobile Personal Computers: A Quarter Century of History," July 17, 2000. Data for 2000 are from http://www.nber.org/~confer/2000/ si2000/berndt.pdf. Data for 2001-16 are from ITRS, 2002 Update, On-Chip Local Clock in Table 4c: Performance and Package Chips: Frequency On-Chip Wiring Levels—Near-Term Years, p. 167. Data for 2018 clock speed is for the Intel Core i7-5820K Turbo Boost processor. Figures between available data years are interpolated from surrounding year data.

Internet bandwidth: Data for 1968-2004 are from Dave Kristula, "The History of the Internet" (March 1997, update August 2001), http://www.davesite.com/webstation/net-history.shtml; Robert Zakon, "Hobbes' Internet Timeline v8.0," http://www.zakon. org/robert/internet/timeline; Converge Network Digest, December 5, 2002, http://www.convergedigest.com/Daily/daily. asp?vn=v9n229&fecha=December%2005,%202002; V. Cerf, "Cerf's Up," 2004, http://global.mci.com/de/resources/cerfs_up/. Data for 2005-13 are from Om Malik, "100G, 200G, 400G: Internet's Core is Getting Fatter to Meet Our Tech Planet's Bandwidth Demand, "August 16, 2013; Data for 2018 are AT&T "Internet 1000," available at HighSpeedInternet.com.

DRAM storage (bits per dollar): Data from 1971-2000 are from VLSI Research Inc. Data from 2001-02 are from ITRS, 2002 Update, Table 7a, Cost-Near-Term Years, p. 172. Data from 2003-18 are from ITRS, 2004 Update, Tables 7a and 7b, Cost-Near-Term Years, pp. 20–21.

Cloud storage: Data are from Figure 1, Annual Size of the Global DataSphere, Alex Woodie, "Global DataSphere to Hit 175 Zettabytes by 2025, IDC Says," available at https://www.datanami.com/2018/11/27/global-datasphere-to-hit-175-zettabytes-by-2025-idc-says/.

Exhibit 2: Few Firms Dominate in a Dozen Industries

Market share data are calculated using averages of recent data from the following sources: IBISWorld, available at ibisworld.com; Euromonitor International, available at euromonitor.com; Statista, available at statista.com; Mintel, available at mintel.com; and EBSCO, available at ebsco.com.

Exhibit 3: The Thrust Toward Bigness

Mean and median firm size are calculated using company revenue data from Wharton Research Data Services, available at https://wrdswww.wharton.upenn.edu/. Data are converted into constant \$2018 using the price deflator for GDP from the Bureau of Economic Analysis, U.S. Department of Commerce, available at bea.gov.

Exhibit 4: Not Just Bigger, but More Concentrated Too

Industry revenue and four-firm concentration ratios for 1997: Calculated using United States Census Bureau industry publications, available at https://www.census.gov/programs-surveys/economic-census/library/publications.1997.html. Industry revenue and four-firm concentration ratios for 2012: Calculated from data available at the American Community Survey, United States Census Bureau, U.S. Department of Commerce, available at https://factfinder.census.gov.

Exhibit 5: Bigger Business, Bigger Payoff

Corporate profits relative to GDP: Previous-five year averages, measured before tax, including adjustments for inventory valuation and capital consumption. Data are from the Bureau of Economic Analysis, U.S. Department of Commerce, available at bea.gov. Return on invested capital: Measures exclude goodwill and are for U.S.-based nonfinancial corporations with inflation-adjusted annual revenues of \$1,000,000,000 and over. Data are from Measuring and Managing the Value of Companies, 6th Edition, McKinsey Corporate Performance Analytics, August, 2015.

Exhibit 6: Benefits for Consumers

Cox, W. Michael, and Richard Alm, Onward and Upward! Bet on Capitalism It Works, 2015-16 Annual Report, O'Neil Center for Global Markets and Freedom, Cox School of Business, Southern Methodist University, available at oneilcenter.org.

Exhibit 7: More Stability, Less Equality

Length of economic expansions and contractions: National Bureau of Economic Research, available at nber.org. GINI coefficient: United States Census Bureau, Current Population Survey, Annual Social and Economic Supplements, available at census.gov.

2018-19: Year in Review

The O'Neil Center's highlights for the 2018-19 academic year include an on-campus conference with the theme "Ethical Conundrums of Capitalism." The event brought together a half-dozen scholars to respond to critics who condemn America's free enterprise system for promoting inequality, ignoring job losses, holding back women, encouraging vices and tolerating sweetheart deals for cronies and insiders (see box below).

The conference was just a warmup. The O'Neil Center co-hosted the prestigious Mont Pelerin Society regional meeting, attended by about 325 leading free market thinkers from around the world. A symposium on "Faith and the Free Market" provided a lively discussion of the relationship between free enterprise and religion. The

center's public events also included two Texas Economic Forums—one in the fall on Texas-Mexico economic integration and the other in the spring on the pending United States, Mexico, Canada trade agreement.

The widely read O'Neil Center Annual Report essay explored the growing economic ties between Texas and Mexico and the threat to the binational partnership from declining support for open trade and investment in both the United States and Mexico.

O'Neil Center scholars published more than 60 articles for academic and general interest publications, and they delivered more than 40 speeches, presentations and lectures. Teaching Free Enterprise, a program providing instruction and curriculum materials to improve economic education in high schools, had its biggest year ever, with more than 1,500 teachers attending workshops, plus four new curriculum units. The O'Neil Center taught over 500 students in SMU Cox classes, with 83 more students attending the center's seven reading groups. The Workshop Series brought eight scholars to the O'Neil Center for presentations of research in progress.

These activities served the O'Neil Center's mission to study why some economies are rich and growing rapidly while others are poor and growing slowly. To this end, the center fosters an understanding of economic freedom among students, policymakers and the general public. We're the only research institute with expertise in measuring economic freedom at all three levels of economic analysis—national, state and metropolitan areas.

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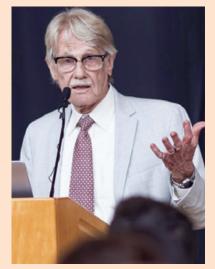
Ethical Conundrums of Capitalism

After a one-year hiatus to accommodate an SMU lecture by Walter Williams, one of the icons of free-market economics, the O'Neil Center revived its annual conference in September 2018, welcoming more than 200 students, academics and business leaders to a half-day symposium on "Ethical Conundrums of Capitalism."

Luncheon keynote Vernon Smith (Chapman University) described some of the pioneering work in experimental economics that won him the Nobel Prize in 2002. He said the research reintroduced human idiosyncrasies into economics and still verified Adam Smith's 250-year-old ideas about how markets work.

The program began with morning keynote Jim Otteson (Wake Forest University) tackling "Markets, Justice, and Social Justice." Rather than lamenting inequality, he said, we should recognize how capitalism has raised living standards and lifted billions of people out of grinding poverty.

In "The Churn: Paradox of Progress," the O'Neil Center's W. Michael Cox explained how job losses are a necessary part of the free enterprises' process of raising living standards. Jessica Flannigan (University of Richmond) addressed "Choice Feminism and Capitalism: Why Equal Rights Requires Economic Freedom," contending that only markets give full sway to women's diverse tastes, talents, values and goals.



Vernon Smith

Scott Cunningham (Baylor University) spoke on "Technology and the Black Market," showing that websites helped reduce street prostitution and violence against women. Brink Lindsey (Niskanen Center) closed out the session with "Capitalism's Achilles Heel: Capitalists," pointing to the harm that occurs when businesses enlist government to thwart market mechanisms.

All the conference presentations can be viewed on the O'Neil Center website at oneilcenter.org.

With an annual budget of more than \$2 million, the center relies primarily on donors to fund its operations. We're grateful for the generous support from the William D. Armentrout Foundation, McLane Company, the Charles G. Koch Charitable Foundation, the William J. O'Neil Foundation, the Deason Foundation, Richard W. Weekley, Tucker Bridwell and numerous other individual donors.

In the past academic year, as in all previous ones, the O'Neil Center's activities and accomplishments represent the efforts of a hard-working, creative and dedicated staff:

Robert Lawson, the Jerome M. Fullinwider Centennial Chair in Economic Freedom, completed his fourth year as O'Neil Center director.

Al Niemi, former SMU Cox dean, held the William J. O'Neil Chair in Global Markets and Freedom.

W. Michael Cox, O'Neil Center founding director, led the Texas Economic Freedom initiative and co-authored the center's Annual Report essay.

Richard Alm collaborated with the Cox on the Texas Economic Freedom initiative and Annual Report essay.

Continued next page

Hey, O'Neil Center Staff, What Economics Classic Influenced You?



Robert Lawson The Moon Is a Harsh Mistress (1966)Robert Heinlein



Albert W. Niemi Wealth of Nations (1776)Adam Smith



W. Michael Cox Capitalism, Socialism and Democracy (1942) Joseph Schumpeter



Richard Alm Free to Choose (1979)Milton and Rose Friedman



Dean Stansel Capitalism and Freedom (1962) Milton Friedman



Meg Tuszynski Democracy in Deficit (1977) James M. Buchanan and Richard E. Wagner



Ryan Murphy Law, Legislation, and Liberty, Volume 1 (1973)Friedrich Hayek



Michael Davis University Economics (1964) Armen A. Alchian and William R. Allen



Daniel Serralde The Road to Serfdom (1944) Friedrich Hayek



Liz Chow Freakonomics (2005)Steven D. Levitt and Stephen J. Dubner



Ray Hughel Economic Sophisms (1846)Frederic Bastiat

Dean Stansel co-authored the Economic Freedom of North America report and led the O'Neil Center's student reading groups.

Meg Tuszynski, O'Neil Center assistant director, managed the event calendar while continuing her own research projects.

Ryan Murphy primarily worked with Lawson on economic freedom research, published dozens of articles and led the center's advanced reading group.

Mike Davis once again shouldered the center's heaviest teaching load and was a versatile and quotable resource for local TV and other media.

Daniel Serralde, economic education coordinator, continued to expand the Teaching Free Enterprise in Texas program.

Ray Hughel traveled around the state

to oversee TFE events.

Program specialist **Liz Chow** handled most of the organizing and marketing for the center's events.



This Year in Review reports on the O'Neil Center's activities and accomplishments for the academic year that began on June 1, 2018, and ended on May 31, 2019. The pages that follow are organized around the center's four mutually supporting initiatives:

- Global Economic Freedom concentrates on measuring economic freedom at the national level and gauging its impact on key metrics of well-being, such as per capita income and poverty;
- Economic Freedom of North America takes a similar approach to measuring

economic freedom and its impacts but shifts the focus to subnational entities i.e., states and metropolitan areas;

- Texas Economic Freedom studies the state and its largest cities, all of which rank high in economic freedom and outperform most of the rest of the nation on key indicators;
- Student Enrichment and Public Outreach spread the ideas of economic freedom and liberty to SMU students in classrooms and reading groups and to the broader community through public programs and the media.

These initiatives overlap and reinforce each other, and O'Neil Center staffers, while they have their own specialties and interests, pitch in across the board, contributing to a range of activities over the academic year. We are a team.

Global Economic Freedom

EFW Report

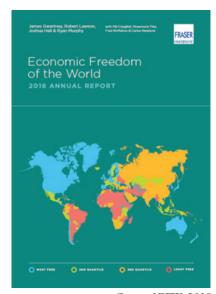
The *Economic Freedom of the World* (EFW) report provides an empirical measure of economic freedom across countries based on the size of government, legal system and property rights, sound money, freedom to trade internationally and regulatory burdens.

The EFW summary index gives researchers a powerful tool to test ideas about free enterprise and its consequences. Studies have found that high EFW scores correlate with higher incomes, faster economic growth, lower poverty rates, higher life expectancy and many other positive outcomes.



Lawson has been a key researcher on the EFW index for more than two decades. At the O'Neil Center, he and Murphy compile the EFW data and calculate economic freedom ratings for 162 countries. Lawson and Murphy, along with co-authors James Gwartney (Florida State) and Joshua Hall (University of West Virginia), released the latest EFW report in September.

The new data showed that the most economically free places in 2016 were Hong Kong, Singapore, New Zealand, Switzerland, Ireland and the United States at No. 6. The U.S. ranking represents a move upward from 11th place. The country stood out in sound money and labor market regulation; its weakest showings were in size of government and freedom to trade internationally.



Cover of EFW, 2018

At its annual meeting in April, the Association for Private Enterprise Education (APEE) recognized Lawson's work on the EFW by awarding him the Adam Smith Award, APEE's highest honor. The award recognizes sustained and lasting contributions to the perpetuation of the ideals of a free market economy as first laid out in Adam Smith's *Wealth of Nations*.

The Journal of Private Enterprise will publish Lawson's acceptance speech under the title "The Consequences and Causes of Economic Freedom: Adam Smith Award Remarks."

Mont Pelerin Society Meeting

Founded in 1947 by Friedrich Hayek, Milton Friedman, Ludwig von Mises and other eminent economists, the Mont Pelerin Society has become the most prestigious organization for the advancement of free-market ideas. In May, the O'Neil Center partnered with Texas Tech's Free Market Institute to host the society's regional meeting in downtown Fort Worth—a first for any university or city in Texas.

Lawson, Serralde and Chow worked for months getting myriad details right-from inviting speakers to designing a commemorative belt buckle. Dressed in cowboy hat, bolo tie and boots, Lawson joined Tech's Ben Powell in running the show.

Three days of speeches and panel discussions covered such topics as free trade, monetary institutions, immigration, regulatory issues, the proper role of government in society, welfare policy, religious freedom and foreign policy.

Alm joined Roberto Salinas de Leon (Atlas Network) and Pia Orrenius (Dallas Fed) for a breakfast panel on "Assessing the Texas and Mexico Relationship." Cox was the keynote speaker at a private dinner sponsored by the Reason Foundation, updating Joseph Schumpeter's famous inquiry "Can Capitalism Survive?" On a Mont Pelerin Society panel highlighting young scholars, Murphy delivered a paper titled "Corporations as the Outgroup," an exploration of profits, the public and the moral standing of corporations.



Cowboy Bob Lawson

Faith and Free Markets

For the first time in its history, the O'Neil Center co-hosted a second conference, held just a month or so after "Ethical Conundrums of Capitalism" (see Page 17). "Faith and the Free Market" explored the connections between theology and economic policy. Co-hosted by SMU's Center for Faith and Learning, the program featured two hourlong panels.

The first centered on the question "How does your faith inform your outlook on economic policy?" In addition to the O'Neil Center's Mike Davis, the panel included ethics professor Steve Long (SMU), consultant Abby McCloskey (McCloskey Policy LLC) and journalist Christine Emba (The Washington Post).

The second panel featured the Rev. Robert Sirico (The Acton Institute), Art Carden (Samford University), Russ Roberts (Hoover Institution) and Imad-ad-Dean Ahmad (Minaret of Freedom Institute). Their topic was: "What insights about free markets do you learn from your faith tradition?"

Academic Publications

Lawson published and Murphy "What Matters More, Institutions or Specifications? A Critical Assessment of the Correlates of Institutional Development" in Institutions and Economies. The paper finds fairly robust evidence of changes in economic freedom contributing to faster economic growth.

Lawson's "The Economics of Gross-Receipts Taxes: A Case Study of Ohio" appeared in For Your Own Good: Taxes, Paternalism, and Fiscal Discrimination in the 21st Century, a book edited by Adam J. Hoffer (Wisconsin-La Crosse) and Todd Nesbit (Ball State). Lawson considers the economic and legal ramifications of grossreceipt taxes, with a special examination of Ohio's Commercial Activities Tax.

Lawson, with co-authors Keven Grier (Texas Tech), SMU alum Keri Lawson, and Samuel Absher (Texas Tech), published "So You Say You Want a (Rose) Revolution? The Effects of Georgia's 2004 Market Reforms" in Economics of Transition and Institutional Change. The paper examines the impact of Georgia's

economic liberalizations and concludes that the reforms led to faster economic growth, reductions in infant mortality and no worsening in income inequality or unemployment.

Tuszynski and co-author Richard Wagner (George Mason University) wrote "Samaritan's Dilemmas, Wealth Redistribution and Polycentricity," a chapter in James M. Buchanan: A Theorist of Political Economy and Social Philosophy. Continued next page

Principles linked to the eminent Public Choice economist suggest that income redistribution might be carried out more effectively at local levels than at the national level.

Looking at the real world rather than theory, Murphy found only three functional socialist countries—and all of them later liberalized. *The Independent Review* published his work as "The Best Cases of Actually Existing Socialism." In a subsequent *Review* issue, Murphy honed his arguments in "Reply to Munger."

Murphy and co-author Robert Gelfond (MQS Management) advocated greater use of an underappreciated statistical technique in "A Call for Out-of-Sample Testing in Macroeconomics," published

in Libertas: Segunda Epoca.

The Journal of Regional Analysis & Policy published "The Long-Run Impact of Agricultural Diversity on Economic Freedom" by Murphy and co-author Luke D. Yeom (SMU undergraduate).

Murphy and co-author Colin O'Reilly (Creighton University) wrote "And the IMF Said, Let There Be Data, There Was Data: Private Capital Stocks in the Eastern Bloc," an *Econ Journal Watch* paper that critiqued the International Monetary Fund's statistics on public and private capital.

In "Imperfect Democracy and Economic Freedom," published in the Journal of Public Finance and Public Choice, Murphy cast doubt on the idea that economic freedom requires countries to achieve full democracy.

Economics of Governance published Murphy's "The State Economic Modernity Index: An Index of State Building, State Size and Scope, and State Economic Power," which fills a gap in the understanding of economic freedom by looking at countries' institutions and ability to administer a modern economy.

Murphy wrote "The Long-Run Effects of Government Ideology on Economic Freedom," published in *Economic Affairs*. The paper uses a previously ignored data source to find that ideology's role in economic freedom has been positive but relatively weak and quickly dissipating.

Presentations and Speeches

Lawson is in demand for public lectures on the EFW index and its implications. This academic year's itinerary included talks at North Dakota State University, Texas Christian University, Duke University and University of Texas at Dallas (Colloquium for the Advancement of Free-Enterprise Education).

Lawson and co-author Ben Powell (Texas Tech) prepared for the July release of their timely book *Socialism Sucks: Two Economists Drink Their Way Through the Unfree World.* Together, they led a public discussion on socialism at Metro State University of Denver in February. Lawson presented a synopsis of *Socialism Sucks* at April's APEE meeting in the Bahamas.

In October, the Gruter Institute for Law and Behavioral Research invited Murphy to Washington, D.C., to discuss his "Psychopathy in Politics" research at a conference on Human Behavior and Leadership: An Interdisciplinary Approach.

At the Mont Pelerin Society's general meeting that month in the Canary Islands, Lawson chaired a session on monetary institutions featuring Larry White (George Mason University) and John Taylor (Stanford).

In October, Lawson lectured students on EFW, Public Choice and the perils of socialism at Israel's Friedberg Economics Institute. This was Lawson's second trip to speak at Israeli educational institutions.

Murphy presented his research on "Economic Freedom Variables Endogenous to Business Cycles" at the Southern Economic Association's November meeting, held in Washington, D.C.

At the April APEE meeting, Murphy delivered a presentation on

"Accounting for the Components of Socialist Calculation."

At Harding University in Searcy, Ark., Cox spoke to students and business leaders on "Capitalism: Society's Greatest Anti-Poverty Program Ever." At McMurry University in Abilene, Cox's topic was "The Global Economy and the Benefits of Capitalism." Both speeches highlighted his research on U.S. living standards and the country's free enterprise system.



W. Michael Cox

Cox gave separate Dallas speeches sponsored by Jackson National Life Insurance and MPACT Financial Group, addressing the topic "A Tale of Two Economies: Why Today's Economic Statistics Understate America's Progress." Cox told the business audiences the same story: that common economic measures—most notably, GDP—mislead us because they fail to show the true strength of the U.S. economy.

Jackson National Life sent Cox to Columbus, Ohio, Birmingham, Ala., and Boston to speak to financial professionals on "Age Shift: An Optimistic Perspective on America Today." He told the two audiences that the United States would continue to prosper as it moved into the next phase of its economic evolution, an argument that Cox and Alm made in the O'Neil Center's 2016-17 Annual Report essay *The Imagination Age*.

Economic Freedom of North America



EFNA grew out of EFW work.

EFNA Report

Since 2013, Stansel has been the primary author of the Economic Freedom of North America (EFNA) report, a data-driven assessment of the balance between markets and government control in each of the continent's states and provinces. Studies find that greater economic freedom correlates with faster economic growth and higher incomes.

Stansel and co-authors Jose Torra and Fred McMahon released EFNA's 2018 report in November. At the top of the U.S. list—the most economically free states at the subnational level—were Florida, New Hampshire, Texas, Tennessee and South Dakota. All were in the previous year's Top Five. At the bottom of the list, exhibiting the least economic freedom, were New York, Kentucky, West Virginia, California and Alaska.

Stansel wrote three newspaper articles following the release of the latest EFNA report: "To Increase Prosperity, Missouri Should Increase Freedom," published in several newspapers in Missouri; "Florida Ranks First, New York Last on Economic Freedom" in Florida Daily; and "Voters, Take Note: Economic Freedom Means Economic Growth" (with Michael LaFaive, Mackinac Center for Public Policy) in The Hill.

Revised Metro Index

In partnership with the Reason Foundation, Stansel released a revised economic freedom index for the nation's metropolitan statistical areas (MSAs) in early 2019. Using methodology similar to that of the EFNA report, the updated index combines nine variables to rank 382 local economies on government spending, tax burdens and labor-market restrictions.

Stansel created the first MSA economic freedom index in 2013. The new version uses more recent data and extends the measurement back in time to 1972.

Stansel, Cox and Alm explored the links between MSA economic freedom and economic outcomes, finding that more economically free MSAs tend to do better on economic growth, job creation, unemployment, living costs, after-tax income, new business formations, net in-migration and income inequality.

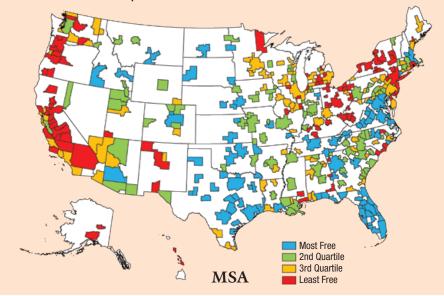
In January, Stansel wrote about

the implications of his revised MSA economic freedom index in "Why Do Some Local Economies Thrive While Others Struggle?"—an op-ed in Investor's Business Daily.

In February, Stansel wrote about the

MSA results in two other newspaper articles: "Florida Rules When It Comes to Economic Freedom" in The Florida Daily and "Southern California's Lack of Economic Freedom" in The Orange County Register.

U.S. Metropolitan Area Economic Freedom Index



Academic Publications

Stansel and Tuszynski worked together on two EFNA-related scholarly papers:

- "Sub-national Economic Freedom: A Review and Analysis of the Literature," published in the *Journal of Regional Analysis and Policy*, surveyed research using the North American index.
- "Institutions, Trade, and Economic Prosperity: An Examination of the U.S. and Mexican States," a Mission Foods Texas-Mexico Center Research Paper, found positive results for places with greater economic freedom.

Stansel and Tuszynski also collaborated on "Targeted State Economic Development Incentives and Entrepreneurship" in the *Journal of Entrepreneurship and Public Policy*. Their results imply that economic development incentive programs are unlikely to increase entrepreneurial activity and may decrease it.

Stansel's "Labor Market Freedom and Economic Prosperity: How Does Missouri Compare?" appeared in the fall/winter issue of *Missouri Policy Journal*.

Public Finance Review published "Local Governments and Economic Freedom: A Test of the Leviathan Hypothesis" by

Stansel and co-authors Adam Millsap (Florida State) and Bradley Hobbs (Clemson). It found that metro areas with more local governments (relative to size of the area) tend to have higher economic freedom.

Two of Stansel's academic publications focused on the revised MSA index: "Economic Freedom in U.S. Metropolitan Areas" in the *Journal of Regional Analysis and Policy* and "U.S. Metropolitan Area Economic Freedom Index," a Reason Foundation *Policy Study*.

Murphy and co-author Alex Nowrasteh (Cato Institute) wrote "The Deep Roots of Economic Development in the U.S. States: An Application of Putterman and Weil" for the *Journal of Bioeconomics*. It finds that the passage of time improves some states' institutions but does little to advance economic freedom.

MSA economic freedom was a key component in a research project leading to "The Long-Run Impact of Agricultural Diversity on Economic Freedom," which Murphy and co-author Luke D. Yeom (SMU undergraduate) wrote for the *Journal of Regional Analysis & Policy*.

Presentations and Speeches

For a fourth straight year, the O'Neil Center hosted June's Economic Freedom of North America conference, which brought together scholars from the United States, Mexico and Canada to discuss the EFNA index and its value in economic research.

In a presentation titled "Economic Freedom of North America: An Overview," Stansel summarized the EFNA results and prospects. Murphy reported on some new research in "The Legal System and Protection of Property Rights at the Subnational Level."

Stansel traveled to June's Western Economic Association conference in Vancouver, B.C., to discuss his work with Tim Allen (Florida Gulf Coast University) on "Housing Prices and Economic Freedom in U.S. Metropolitan Areas."

The study finds that economic freedom's negative effect on suppliers' costs exceeds its positive impact on consumer demand.

The State Policy Network asked Stansel for remarks on "Connecting with University-Based Academics and Centers to Help Advance Your Organization's Research and Policy Goals" at its October annual meeting in Salt Lake City.

Stansel's research with Adam Hoffer (Wisconsin-La Crosse) and Imran Arif (Appalachian State University) found that economically freer MSAs had greater inmigration. Using this analysis, Stansel delivered presentations on "Economic Freedom and Migration: A Metro Area-Level Analysis" for the Southern Economic Association (November), Texas Tech's Free Market Institute (February), Eastern Economic Association (March), Public Choice Society (March) and the APEE meeting (April).

Stansel spoke on "Economic Freedom: What It Is and Why It Matters" at a February Mackinac Center for Public Policy, Issues and Ideas Forum in Lansing, Mich.

In March, Stansel made a presentation titled "Measuring Economic Freedom at the State and Local Level" at a research seminar on using novel data to examine the impact of government policies, sponsored by the Institute for Humane Studies and the Mercatus Center. The talk covered both EFNA and his updated MSA index.

At the APEE meeting in April, Stansel gave a presentation on "Economic Freedom and the Wealth of Cities," based on the work he did with Cox and Alm. The results showed that MSAs with the greatest economic freedom had the best economic performances.

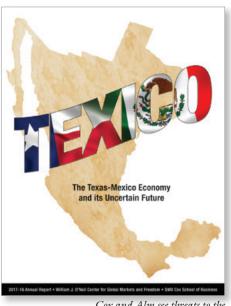
Texas Economic Freedom

Welcome to Texico

Cox and Alm wrote "Texico: The Texas-Mexico Economy and its Uncertain Future," their ninth O'Neil Center Annual Report essay.

Released in October, it tells the story of two long-time neighbors that finally began to integrate their economies in earnest after the carnage of the 1980s oil bust. In the following decades, private sectors on both sides of the border seized the new opportunities, allowing Texas and Mexico to build myriad economic ties through exchanges of goods, services, investment and knowledge.

"The gains already realized make a strong case for maintaining the connections across the border," Cox and Alm write. "Looking to the future makes the case even better because of the vast untapped potential for business in Texico."



Cox and Alm see threats to the policies that make Texico possible.

That potential may never be realized. The essay warns that Texas-Mexico economic integration faces an uncertain future. The political consensus supporting North American Free Trade Agreement (NAFTA) and Texas-Mexico integration has begun to fray because of a resurgent economic nationalism in both countries, personified by U.S. President Donald Trump and Mexican President Andres Manuel Lopez Obrador.

At the same time, the expected convergence between north and south has been slow and uneven, largely due Mexico's persistent corruption, cronyism, slow-moving bureaucracy and drug violence. Cox and Alm contend that greater economic freedom will be key to Mexico's reaping the full benefit from Texico's opportunities.

Texas Economic Forum

The O'Neil Center held its fifth and sixth Texas Economic Forums, inviting the DFW business community to the SMU campus for a dialogue on issues relevant to the state's economy.

In October, the center partnered with SMU's Mission Foods



SMU students attend Texas Economic Forum

Texas-Mexico Center for a discussion of the expanding business ties between Texas and Mexico. Cox's presentation, titled "A Tour of 'Texico'-Two Economies Growing Together," was based on the research in the Annual Report essay. Tiffany Melvin, president of the North American Strategy for Competitiveness, followed with "Blurring Boundaries: Why Integration Matters," offering insight on cross-border commerce from the point of view of businesses engaged in it.

In March, the O'Neil Center partnered with the Texas-Mexico Center and The Texas Lawbook for "The New NAFTA: Getting Down to Business," an examination of the proposed United States, Mexico, Canada (USMCA) agreement. A panel led by Luisa del Rosal (Texas-Mexico Center) included three Dallas-based lawyers who advise companies on doing business in Mexico—Alberto De La Pena (Haynes and Boone), Tim Leahy (AT&T Latin America) and Andres Alvarez (Foley Gardere). Del Rosal and the lawyers agreed that ratification of the new agreement was important to the Texas' continued prosperity.

Writing about Texas' Economy

In the past decade, Cox and Alm have written more than 40 columns on the Texas and DFW economies for *D CEO*, Dallas top business magazine. Their articles for the 2018-19 academic year were:

- In July's issue, "The Importance of Imports" discussed how goods from abroad contribute to the prosperity of Texas, the nation's top exporting state.
- In September's issue, "Car Crazy" looked at new transportation technologies that promise to do for DFW what billions in rail investment hasn't—relieve road congestion.
- November's issue featured "Welcome to Texico," a condensed version of the Annual Report research on economic ties between Texas and Mexico.
- "Capitalizing on Digital Retail" came out in the January/ February issue. It suggested that DFW, a retailing titan in the brick-and-mortar era, had a cost edge in the transition to online retailing.
- In April's issue, "OMG! Is a Recession Coming?" tried to assuage fears of a possible recession by examining how DFW and Texas fared in past slumps.

Before the end of May, *D CEO* hit the newsstands with its June issue, which included Cox and Alm's "Texans Still Make Things," which shows that Texas manufacturing activity is continuing to expand, partly because of the state's large capital stock.

Stansel co-authored two Texas-themed articles with Vance Ginn (Texas Public Policy Foundation): "Texas' Economic Freedom Ranking Remains High but Drops to 3rd Nationwide" in *The Hill* (November) and "When You Think of Economic Freedom, You Should Think of Buc-ee's" in *The Dallas Morning News* (December).

In a March op-ed in the Austin-based *Texas Tribune*, Lawson made a plea to "Save the Dune Buggies!" He contends the Texas

Department of Motor Vehicles' decision to stop issuing titles and registrations for the beach vehicles is really an attempt to support automobile dealers' efforts to block direct vehicle sales to customers.

Cox and Alm wrote a chapter on Texas-Mexico economic integration for a book from Rice University's Center for the United States and Mexico. Scheduled from released in the fall, *The Future of U.S.-Mexico Relations* attempts to take a long-term view of the factors that will shape the destiny of these two nations. Cox and Alm acknowledge the dangers from nationalist policies, but they expect the forces favoring greater integration to prevail in the longer term.

O'Neil Center research on state and local economies has been featured in *The Texas Economy*, the center's online newsletter. In second quarter, Alm wrote "Trump and the Texas Economy," a report from the May 2018 Texas Economic Forum on how the Texas economy will fare under the president's trade, immigration, regulation and energy policies.

In *The Texas Economy* issue for the third quarter, Cox and Alm wrote "The Texas Triangle," which discussed the importance of an area delineated by DFW, Houston and San Antonio to the state's prosperity.

In *The Texas Economy* for the fourth quarter, Cox and Alm wrote "Economic Freedom Fuels Texas Cities' Prosperity," using Stansel's new MSA economic freedom index to show that DFW, Houston, San Antonio and Austin grow rapidly because of policies that favor the private sector.

In "Freedom Capital Stock," the *Texas Economy* for the second quarter, Cox and Alm use the EFNA and MSA economic freedom measures to construct a decades-long comparison of how Texas and its big cities compare to the rest of the country. The idea is that yesterday's economic freedom is still paying dividends today, and today's economic freedom will deliver benefits in the future. That makes economic freedom a form of capital stock.

Presentations and Speeches

Cox and Alm discussed the Texas and DFW economies with government and business leaders from Latin American nations—Peru, Venezuela, Panama, El Salvador, Colombia and Mexico—seeking advice on jump-starting their economies to achieve faster growth.

At the request of the Greater Dallas

Chamber of Commerce, Cox gave a presentation on "What Drives the Texas and DFW Economies" to executives from Finland's Nordea Bank, who were in town to explore the opening a DFW office and other investments. Cox gave a similar speech to the Dallas Citizens Council.

In a Houston speech sponsored by

United Capital, Cox chose the relevant topic "Onward and Upward: The U.S., Texas and Houston in the Year Ahead," assuring business leaders and investors that the metropolitan area's economy was recovering following the one-two punch of the oil-price bust (2016) and Hurricane Harvey (2017).

Continued next page

Stansel was a speaker at a June 2018 session on "Which Institutions Best Support Prosperity in Texas and Beyond?"—a Policy Research Seminar co-hosted by the Institute for Humane and Texas Public Policy Foundation.

In a presentation sponsored by the Dallas World Affairs Council, Cox addressed representatives of several Latin American countries on "International Trade and the Global Economy."

Twice a year, Cox holds a colloquium with a group of local investors and business executives. In May, he talked to them about "The 2018-19 Economic Outlook for the U.S. and Texas."

At April's APEE meeting, Alm made a presentation titled "The Uncertain Future of Texas-Mexico Integration," based on his Texico research project with Cox.

Student Enrichment and Public Outreach

O'Neil Center Reading Groups

The O'Neil Center launched its first freemarket reading group in 2014. During the 2018-19 academic year, the center had three groups in the fall semester and four in the spring semester, each meeting once a week.

A total of 83 SMU students participated in the seven groups. In both the fall and spring semesters, SMU reading group participants joined students from similar programs at Texas Tech, Baylor and Central Arkansas for a two-day summit.

Stansel led the McLane Teammates Scholars and Armentrout Scholars reading groups, and Tuszynski handled a new group in the spring—the Bridwell Scholars. Murphy guided a weekly session for advanced students who wanted to build on their participation in a previous O'Neil Center reading group.

The fall reading groups' theme was "The

Role of Government in a Free Society." Participants read and discussed classics by such scholars as Adam Smith, John Locke, J.S. Mill, Karl Marx before turning to more contemporary works by Milton Friedman, Friedrich Hayek, Robert Nozick and John Rawls. The group explored such questions as: What is the legitimate role of government? For what purposes are we willing to impose taxes and imprison people who don't pay them?

At the fall summit, hosted by the O'Neil Center, 54 students heard a keynote lecture by Duke University economics and political science professor Michael Munger, who discussed the emergent sharing economy analyzed in his book Tomorrow 3.0.

The spring groups' theme was "The Economics of Knowledge," and readings included works from such authors as F.A. Hayek, Joseph Stiglitz, Bryan Caplan, and Cass Sunstein. The group explored questions such as:

What role does education play in a modern economy? Why is the college wage premium so large? What roles do the market and the government play in innovation? Does strict enforcement of intellectual property rights encourage innovation? Should some public policies be left to experts instead of voters? If so, which ones? Can expert planning replace market competition?

The summit, once again hosted by the O'Neil Center, brought together 70 students to hear Caplan, an economics professor at George Mason University, deliver an iconoclastic lecture based on his book The Case Against Education.

For Murphy's fall reading group, the theme was "A Modern History of Libertarianism." The centerpiece reading was Brian Doherty's Radicals for Capitalism, supplemented by materials on events since its publication in 2007. Doherty's focus was primarily on Ludwig von Mises, Murray Rothbard, Milton Friedman and Ayn Rand.

In the spring, Murphy led discussions on the "History of Economic Thought," ranging from the precursors to Adam Smith to the present state of macroeconomics. Main texts used were Robert Heilbroner's The Worldly Philosophers, Todd G. Buchholz's New Ideas from Dead Economists and Lawrence White's The Clash of Economic Ideas.



Mike Munger talks to Reading Group students

Teaching Free Enterprise

Begun in 2015, Teaching Free Enterprise (TFE) offers workshops and curriculum materials for high school teachers, with the goal of helping them meet the state's mandate to provide economics instruction with an emphasis on the free-enterprise system and its benefits.

Under Serralde's direction, the donor-supported program moved forward during the 2018-19 academic year, setting records with 31 workshops

and total attendance of nearly 1,500 teachers. Taken together, they taught an estimated 200,000 students, suggesting a large potential impact for the program.

Since its inception, TFE relied on a cadre of Texas-based economists, and O'Neil Center instructors played a big role. The first four curriculum units came from Lawson ("Trade" and "Economic Freedom of the World") and Cox ("Paradox of Progress" and "Time Well Spent").

As it grew, TFE tapped into more O'Neil

Center experts. Stansel and Tuszynski, for example, wrote "Taxation and Public Finance."

Tuszynski wrote two of the six curriculum units added in the 2018-19 academic year: "Public Choice 1: Governments and Markets" and "Public Choice 2: The Political Process." At an April session at SMU, Stansel added a TFE lesson plan on "Economic Freedom of North America," and Alm debuted a TFE unit on "Sports Economics." Non-O'Neil Center professors developed units on "Game Theory" and "Economics of Risk," bringing the program's total offering to 21 courses.

Stansel taught at 13 TFE workshops in the 2018-19 academic year. Cox presented his units at six sessions. Lawson traveled around Texas to present his two units at five sessions. Tuszynski taught at five workshops. After debuting "Sports Economics" in Dallas, Alm repeated the unit in Edinburg and Wichita Falls. The O'Neil Center staff planned to hit the road for dozens of other workshops in the summer of 2019, the busiest time of the year for TFE instruction.



Richard Alm at TFE workshop in Denton

Teaching SMU Cox Courses

O'Neil Center professors teach a variety of economics courses at SMU Cox—both required and elective, undergraduate and graduate. All told, over 500 students enrolled in these courses during the 2018-19 academic year.

In the fall semester, Lawson taught four sections of Managerial Economics to 190 MBA and MS students, including those in the new one-year MBA program. He also taught two sections of Microeconomics

for students enrolled in the executive MBA program.

Cox taught Managerial Economics to PMBA and MS students. His long-running Markets and Freedom summer course provided non-business majors with important lessons in the working of America's free-enterprise system.

Davis taught International Finance and Corporate Finance for both undergraduate and graduate students, and Macroeconomics and Decision-Making under Uncertainty for graduate students. He was the faculty adviser on student trips to China (Hong Kong and Shenzen), South America (Colombia and Peru) and Europe (England, Czech Republic and Germany).

Niemi continued to teach Evolution of American Capitalism. A shortened version formed the basis for the Certificate in American Capitalism, offered through the SMU Cox continuing education program.



Media Expert of the Year Awards

Radio, Television, Print, the Web

The media called on O'Neil Center staffers for their comments on a range of topics. At the end of the 2018-19 academic year, SMU Cox recognized Davis, Stansel, Murphy and Cox with Media Expert of the Year Awards, which were based on each winner's single story with the greatest potential national exposure.

Due to his 25-year Federal Reserve career, Cox was once again in demand for interviews on Fed policy. He went to the SMU television studio several times to hook up with Fox Business newscasts and offer instant analysis on the Federal Reserve's Open Market Committee (FOMC) meetings. Finance quoted him in articles on "Trump's Comments on the Economy and the Fed," "The Direction of Interest Rates" and "Parsing the FOMC Meeting." Bank Rate, a financial industry publication, includes Cox's

input in its weekly interest rate forecast.

In 2018-19, Stansel did 46 radio interviews. Nine of them were on the Ed Dean Show, Florida's No. 1 statewide radio show.

"Boomer Socialism versus Millennial Neoliberalism," Murphy's May op-ed in the Orange County Register, took issue with the common perceptions that young Americans might take the country toward socialism, arguing that Baby Boomers have been using government policy to enrich themselves for decades.

The Florida Daily published two Stansel articles: "What Is Universal Basic Income?" in August and "Tax Cut 2.0: Will It Be a Boon for Retirees?" in September.

Stansel combined EFNA and his work with Tuszynski on targeted incentives in writing "Economic Development Incentives Do Nothing for the Economy or Development," which appeared in the Dallas Morning News in August.

CNBC quoted Cox in an article titled "Texas Exports, Boosted by Oil, Rise 3 Times Faster than the US Increase, Outshining California" and The Columbus Dispatch included his comments in "Democrats 'Tax the Rich' Plans Draw Heavy Skepticism."

Print media called on Stansel for 11 interviews, and publications, including Forbes, Investor's Business Daily and Reason magazine, cited his research at least 16 times.

Lawson discussed the most recent EFW report and his forthcoming book Socialism Sucks: Two Economists Drink Their Way Through the Unfree World in a podcast interview conducted by the Heartland Institute in April.

O'Neil Center Workshop Series

The Workshop Series invites professors from other institutions to SMU Cox for seminars focusing on research in progress. The fall semester featured four workshops:

- Jamie Pavlik (Texas Tech) on "Political Corruption and Development in Brazil: Do Random Audits Matter?" in August;
- John Dove (Troy University) on "U.S. State Tort Liability Reform and Entrepreneurship" in September;
- Christian Bjornskov (Arhaus University) on "Do Voters Dislike Liberalizing Reforms: New Evidence Using Data on Satisfaction with Democracy" in November;
- Claudia Williamson (Mississippi State University) on "Cultural Distance and U.S. Multinational Enterprise Activity" in November.



Williamson

The spring semester also featured four workshops:

- Todd Nesbit (Ball State University) on "Regulation: Increasing Industry Concentration and Undermining Competitive Balance?" in February;
- Chris Surprenant (University of New Orleans) on "Policing and Punishment for Profit" in February;
- Gianna Englert (SMU political science department) on "Enlightened Democracy: Édouard Laboulaye and Citizenship after 1848" in March;
- Raymond March (North Dakota State University) on "Rent-Seeking for Madness: The Political Economy of Mental Institutionalization in America, 1880-1923" in April.



Englert

Other Activities

In March, Tuszynski led the joint Institute for Humane Studies-O'Neil Center reading colloquium "Toleration in a Free Society" for 18 undergraduate students. They read both classic and modern texts on toleration and explored contemporary views on the issue.

For the *MPACT Report* quarterly newsletter, Cox and Alm wrote "A Closer Look at GDP: We're Doing Better Than We Think," "Trade's Truths and Canards," "The Secret of Prosperous Cities" and "The Fed Got Policy Right but Not for the Right Reasons."

In the fall of 2017, Murphy came up with an unorthodox view of why so many American teenagers were risking their health by ingesting Tide Pods. "The Rationality of Literal Tide Pod Consumption," his formal paper on the topic, will be published in the *Journal of Bioeconomics*.

Murphy published "Psychopathy by U.S. State: A Translation of Regional Measures of the Big Five Personality Traits to Regional Measures of Psychopathy" in *Heliyon*. The paper develops the first-ever state-level measure of psychopathy,

identifying the District of Columbia as the country's No. 1 area for psychopaths.

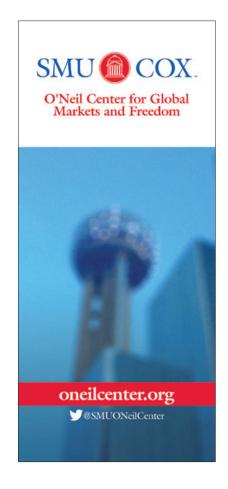
In June, *Arc Digital* published Murphy's essay "Like Free Trade? Good. Time to Drop 'Buy Local,'" which points to the incompatibility of favoring free trade while advocating for consumers to buy from nearby suppliers.

Murphy's "Putting a Price on the Large Personal Cost of Failing to Vaccinate" estimated the implicit cost to individuals of not being vaccinated. *InsideSources*, a clearinghouse for opinion articles, featured the essay in May, and several news outlets picked it up.

Lawson continued as faculty adviser for two SMU student groups, the Young Americans for Freedom (undergraduates) and the Adam Smith Society (MBA students). He was also a member of the APEE board of directors, which met before the organization's annual meeting in the Bahamas.

Stansel and Lawson served on the Faculty Advisory Board for the Mission Foods Texas-Mexico Center at SMU.

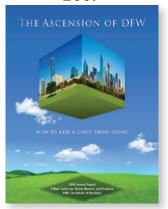
Alm was president of the SMU Faculty Club. He also served on the advisory board for student journalism at SMU.



Still Worth Reading

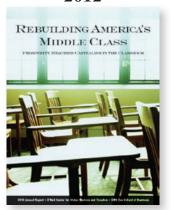
This year's Annual Report essay is the O'Neil Center's 10th. The previous ones are available at oneilcenter.org by clicking on annual reports.

2009



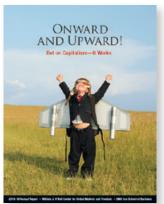
Charting DFW's rise as a powerhouse.

2012



Only education can save the middle class.

2015-16



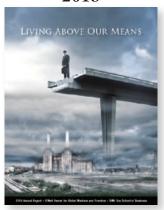
For progress, don't bet against free enterprise.

2010



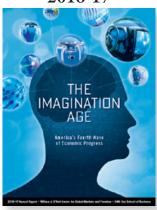
Why Texas attracts so many newcomers.

2013



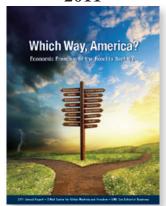
Is America depleting its freedom capital stock?

2016-17



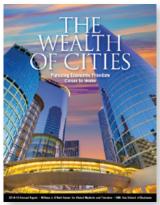
The transition to the next phase of development.

2011



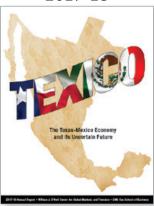
A country at a crossroads-capitalism or socialism.

2014-15



Why some cities prosper and others don't.

2017-18



Threats to the Texas-Mexico economic partnership.



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