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WHAT IS THE ECONOMIC IMPACT FROM THE CORONAVIRUS SHOCK?

By Vivekanand Jayakumar, Ph.D.

The ongoing worldwide spread of the Covid-19 coronavirus has triggered a global recession and generated considerable unease amongst the population. The economic shock resulting from the health emergency is of the relatively rare variety, a twin demand and supply shock (further complications have been created by the oil price shock resulting from the ill-advised price war initiated by Saudi Arabia). The public health crisis, and the associated demand and supply shocks, has put policymakers in a quandary. Traditional forms of intervention, such as interest rate cuts by central banks or tax cuts by governments are unlikely to either fix broken global supply chains or overcome the reticence of fearful consumers to travel and shop freely. Furthermore, in the absence of an effective cure for the Covid-19, attempts to lift demand might be misguided. Despite the potential for severe short-term economic pain, policymakers need to emphasize containment strategies that encourage citizens to avoid unnecessary travel or large gatherings. Widespread adoption of the practice of "social distancing" or the much more extreme option of targeted lockdowns in severely affected areas may be necessary to limit the spread of the coronavirus. Another dilemma facing policymakers in the U.S. and in many other advanced economies is related to the fact that a decade of ultra-accommodative monetary policy in response to the 2008 global financial crisis (and the sub-par recovery that followed) has substantially depleted monetary policy ammunition. Additionally, in the case of the U.S., substantial fiscal stimulus initiated in 2018 had already caused budget deficits to balloon towards the trillion-dollar mark in fiscal year 2019 and pushed gross debt levels past the $23 trillion mark. As some had forewarned, we are battling a crisis with limited policy space, thus making it necessary for fresh thinking regarding the type and scope of interventions to aid the economy.

In the face of a serious national or global crisis, political labels and partisan posturing often need to be thrown out the window. A recent piece in *The Atlantic* ("There Are No Libertarians in an Epidemic" by Peter Nicholas, published online on March 10, 2020) noted that "just as there are no atheists in foxholes, in a national emergency, there's no truly laissez-faire government." Even under normal circumstances, Wall Street financiers, industry executives, and politicians are often quite selective in expressing their disdain for policy interventions. As financial markets panic and as airline, hospitality and other industries face an existential threat, there is now widespread clamor for government aid and central bank action. In this environment, it is, however, necessary to avoid a rush towards adopting policy actions that might prove to be unhelpful in the short run and costly in the long run. Implementing wrong-headed or poorly designed policies may exacerbate what is likely to prove to be a very painful yet temporary shock (sooner or later a vaccine and a cure for Covid-19 is likely to be developed). In the following sections, the nature of the economic problem facing policymakers is highlighted and a careful evaluation of the available monetary and fiscal policy space is provided. In addition, a discussion of effective forms of policy interventions is included.

Following the end of the Great Recession, the U.S. economy embarked on what has proven to be the longest expansion on record (as shown in Figure 1, the duration of the current expansion reached 128 months in February 2020). Prior to the coronavirus shock, the American economy was experiencing a positive output gap (a measure of the difference between the actual output and the potential output). Additionally, U.S. unemployment rate for February 2020 was at 3.5%, a 50-year low. There is a reasonable likelihood that early March 2020 will mark the peak of the current economic cycle. The official arbiter of U.S. business cycle turning points, the Business Cycle Dating Committee

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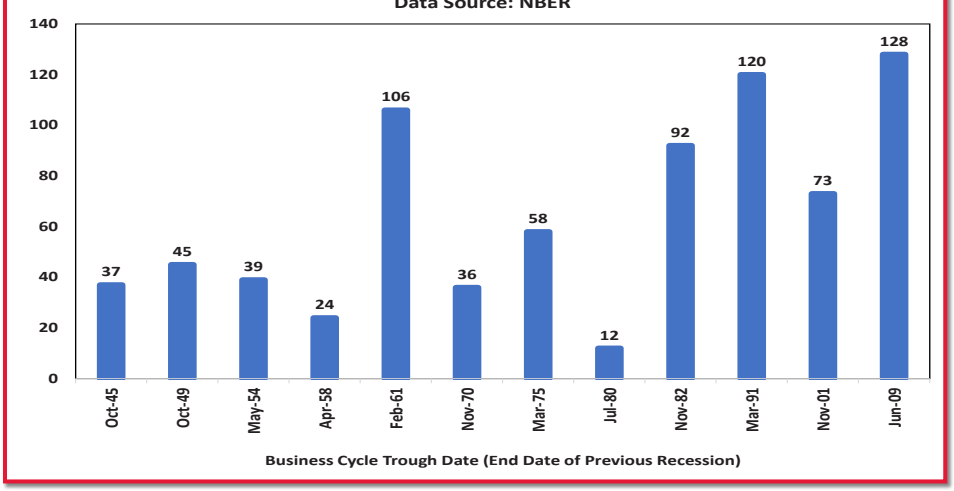
Figure 1: Expansion's Duration (Months)
Data Source: NBER



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of the National Bureau of Economic Research (NBER), defines a recession as "a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in production, employment, real income, and other indicators. A recession begins when the economy reaches a peak of activity and ends when the economy reaches its trough." Prior recessions were caused primarily by three factors. Policy mistakes, oil price shocks and the demise of asset/credit bubbles have been chiefly responsible for most of the post-World War II recessions in the U.S. (see Table 1). The economic slowdown/recession associated with the coronavirus shock is thus relatively unique.

In order to grasp the nature of the economic shocks currently facing the U.S. and other affected economies, it is helpful to distinguish between supply and demand shocks, and to consider the interaction between the two. In an increasingly interconnected global economy, multinational supply chains are fundamentally important for understanding modern day supply-side shocks. As highlighted in a recent report from the United Nations Conference on Trade and Development (UNCTAD), China has become a critical cog in the global supply chain over the past two decades and the middle kingdom's importance is not just based on its role as the "factory of the world"—a reference to China's role as the final assembly destination in the vast global production networks (for instance, around 80% of global smartphones and over 50% of TV sets undergo their final assembly in China). In fact, China has emerged as the primary supplier of intermediate inputs for manufacturers in the U.S. and elsewhere. China currently accounts for about 20 percent (which is up from 4 percent in 2002, when the SARS outbreak was making waves) of global trade involving intermediate goods. The China-centric global supply chain for manufactured products was partially knocked offline when the Chinese government embarked on an extraordinary containment strategy that literally placed tens of millions under quarantine and locked down an entire province during the first quarter of 2020. Besides delaying supply of the Apple iPhone and other electronics, the limited availability of Chinese-made intermediate products has adversely impacted manufacturers worldwide. With the spread of the coronavirus, two other key cogs in the global supply network—South Korea and Japan—have also been forced offline to some extent. With Europe now in the crosshairs of the pandemic, and with the imposition of an international travel ban by many nations, further supply disruptions are inevitable.

On the demand side, some of the adverse effects are easily discernable. The precipitous decline in travel and the discouragement of large public gatherings, along with the widespread cancelation of conventions, sporting events and concerts, will severely impact the transportation and hospitality industry. Furthermore, necessary "social distancing" measures have led to a severe curtailment of spending on restaurant meals, movie/theater tickets, and various forms of group-oriented leisure activities. Smaller, cash-strapped or leveraged firms are particularly vulnerable in this environment. Tourism dependent areas, such as Florida and the Mediterranean region of Europe, will be especially hard hit if the travel restrictions persist for longer than a couple of months. The dramatic collapse of share prices adds another dimension to the demand shock hitting the U.S. economy. The collapse in equity values will create a negative wealth effect and the sharp rise in market volatility adds to the already high levels of uncertainty. Overall, a temporary but sizable demand shortfall appears inevitable.

An additional complication has been introduced by the oil price war involving Saudi Arabia and Russia. Following the failure of the OPEC+ group in early March to reach an agreement regarding production cuts, Saudi Arabia launched a price war that has seen oil prices drop precipitously. This is likely to adversely affect U.S. shale oil exploration and production companies. Many smaller players in the U.S. shale oil sector are highly leveraged and their fortunes are bound to dramatically worsen if low oil prices and the global supply glut (arising from the surge in Saudi and Russian output) persist. A sharp widening of spreads in both the high-yield and the investment grade market suggests that highly leveraged energy firms are encountering a credit crunch.

Given the simultaneity of shocks hitting the economy, there is a potential risk that the present situation might morph into a full-fledged financial crisis. A decade of low interest rates enticed the non-financial corporate sector to gorge on debt. The Institute of International Finance, a trade group, found that in 2019 Q3 (latest available data), the global debt-to-GDP ratio had reached an all-time high of 322% (around $253 trillion) with the total global non-financial corporate sector debt at a record 92.5% of world GDP. If the virus spread is not brought under control, existing fragilities in the financial system have the potential to trigger a global debt crisis. There are already growing signs of financial stress in the U.S. as the non-financial corporate sector is encountering a broad-based liquidity/credit crunch. Corporations have been aggressively tapping their credit lines to continue to pay their bills and deal with a collapsing revenue stream. To build up their cash stockpiles, non-financial corporations are not only drawing down their credit lines but also pulling money out of money market funds. This has created a spillover effect in the money market sector—money market mutual funds are being forced to meet the fund withdrawals by selling their commercial paper holdings. This has created a challenge for firms trying to raise short-term capital by issuing commercial paper—this is eerily reminiscent of the events that followed the collapse of Lehman Brothers. Furthermore, a financial domino effect may result if margin calls (demand for additional capital/securities kick in when underlying asset prices decline sharply), cross defaults (a clause in debt contracts under which a borrower is held in default if he/she defaults on another debt obligation) and corporate bond yield spikes spread in the coming weeks. Columbia University historian Adam Tooze summarized the

Table 1: U.S. Recessions – Duration and Proximate Causes
Source: NBER, Deloitte Insights, and *Business Cycles and Depressions: An Encyclopedia* (Main Editor: David Glasner, New York: Garland Publishing, 1997).

Recession Period	Duration	Proximate Cause
Nov. 1948–Oct. 1949	11	Monetary Tightening
July 1953–May 1954	10	Monetary Tightening Defense Drawdown (after Korean War)
Aug. 1957–April 1958	8	
April 1960–Feb. 1961	10	Monetary Tightening Fiscal Tightening
Dec. 1969–Nov. 1970	11	Monetary Tightening Fiscal Tightening
Nov. 1973–March 1975	16	Oil Price Shock (Arab Oil Embargo)
Jan. 1980–July 1980	6	Oil Price Shock (Iranian Revolution and Energy Crisis) Monetary Tightening
July 1981–Nov. 1982	16	Monetary Tightening
July 1990–March 1991	8	First Gulf War/Oil Price Shock Saving and Loan Crisis Monetary Tightening
Mar 2001–Nov. 2001	8	Bursting of Tech Bubble
Dec 2007–June 2009	18	Bursting of the Housing Bubble

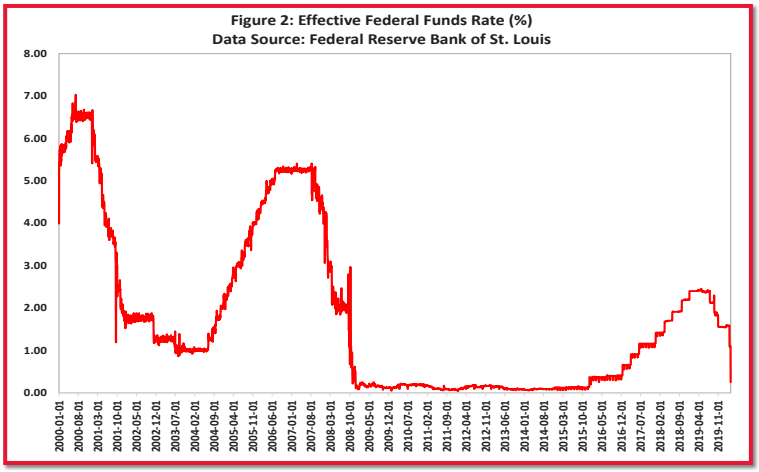

Table 2: Traditional Monetary Firepower (Policy Rate Cuts in Prior Recessions by the Federal Reserve)
Source: NBER, Federal Reserve Bank of St. Louis; Congressional Research Service (CRS); David L. Reifschneider, 2016. "Gauging the Ability of the FOMC to Respond to Future Recessions," *Finance and Economics Discussion Series 2016-068*, Board of Governors of the Federal Reserve System

Official Recession Dates	Date of Peak Rate	Peak Rate	Cumulative Rate Cuts Implemented by the Federal Reserve
Aug. 1957–April 1958	Oct. 1957	3.5%	2.9%
Apr. 1960–Feb. 1961	Feb. 1960	4.0%	2.8%
Dec. 1969–Nov. 1970	Sept. 1969	9.2%	5.5%
Nov. 1973–March 1975	July 1974	12.9%	7.7%
Jan. 1980–July 1980	April 1980	17.6%	4.8%
July 1981–Nov. 1982	June 1981	19.1%	10.4%
July 1990–March 1991	May 1989	9.8%	5.3%
March 2001–Nov. 2001	Nov. 2000	6.5%	4.8%
Dec. 2007–June 2009	July 2007	5.3%	5.1%
?	May 2019	2.45%	Max 2.45% (assuming Fed does not adopt negative rates)

risks in a recent piece: "A sudden credit crunch exposes those that have too much debt and weak business models and have taken excessive risk. Their distress spreads to the rest by way of business closures, job losses, and fire sales of otherwise good assets. Matters are made even worse if the economic victims have financed their activities with borrowing, such that their losses eventually strike the balance sheets of creditors that were unwise enough to lend to them. Fear of these repercussions contracts credit across the board" ("Is the Coronavirus Crash Worse Than the 2008 Financial Crisis?", *Foreign Policy*, published online on March 18, 2020).

Based on the nature of the shocks discussed above and given the rising risk of a credit/financial crisis, it is apparent that the U.S. economy currently is under severe economic and financial strain. Bold thinking on the policy front is clearly called for in these unusual times. Following the stagflationary episodes of the 1970s and early 1980s, the economic consensus shifted—theoretical research indicated that counter-cyclical monetary policy interventions were preferable to short-term fiscal policy actions. As economic orthodoxy put greater onus on monetary policymakers to deal with business cycle fluctuations, central bankers rose to prominence, and, at least initially, enjoyed a great deal of success. During the 1984-2007 period, monetary authorities in the U.S. and elsewhere were able to bring inflation rates down and anchor inflation expectations near the implicit/explicit target level of 2%. In addition, the volatility of both inflation and GDP growth rates declined dramatically (the period was often referred to as the "Great Moderation" era). The 2007-09 financial crisis and the Great Recession upset the prevailing macroeconomic orthodoxy and revealed many of the imbalances that had built up during the Great Moderation era. The coronavirus shock will further rupture the consensus and bring forth fundamental debates regarding the role and efficacy of monetary and fiscal policies.

At present, the U.S. central bank has limited options on the conventional monetary policy front as it has already reached the zero-lower bound or ZLB (see Figure 2). Starting from a peak rate of just 2.45%, the effective Federal Funds Rate fell to near-zero levels in a relatively short-period of time. This contrasts with past recessions when the Federal Reserve had much greater room to conduct traditional monetary policy (see Table 2). The ZLB, or more accurately, the effective lower bound refers to the following constraint faced by central bankers around the world: nominal policy interest rates cannot go much below zero because households/investors have the option of holding zero-interest yielding cash rather than negative-yielding deposits. A few countries, such as Switzerland and Denmark, have experimented with negative policy rates of as much as -0.75% without suffering significant disruptions. It appears that benefits, such as the convenience of undertaking electronic payments/transactions settlements and the safety provided by bank deposit holdings, outweigh the slight negative cost imposed on depositors. Pushing rates too much into negative territory will, however, lead to a spike in cash holdings. Harvard University's Ken Rogoff and former Citibank Global Chief Economist Willem Buiter have in the past suggested abolishing cash to eliminate the ZLB constraint faced by central banks. Such outlandish measures are unlikely to gain much traction in the current environment and the Federal Reserve has shown no inclination to adopt negative rates. Besides, lowering the Federal Funds Rate target further is not likely to provide much comfort to households and corporations in the current environment.

The Federal Reserve has instead decided to double down on unconventional measures to aid the economy. The central bank announced that it will take steps "to support the flow of credit to households and businesses by addressing strains in the markets for Treasury securities and agency mortgage-backed securities." It has deployed "unlimited Quantitative Easing (QE)"—promising to "purchase Treasury securities and agency mortgage-backed securities in the amounts needed to support smooth market functioning and effective transmission of monetary policy to broader financial conditions." The Federal Reserve has re-introduced and expanded several programs ("alphabet soup" programs) from 2008-09 crisis era playbook, and, for good measure, added several new ones to the mix. Recently introduced measures include: (a) reducing the threshold for banks to access the discount window facility, and encouraging banks "to use their capital and liquidity buffers as they lend to households and businesses who are affected by the coronavirus," (b) establishing a Commercial Paper Funding Facility (CPFF) to support the flow of credit to corporations and municipalities, (c) establishing a Primary Dealer Credit Facility (PDCF) in order to allow "primary dealers to support smooth market functioning," (d) establishing a Money Market Mutual Fund Liquidity Facility (MMLF) that "will make loans available to eligible financial institutions secured by high-quality assets purchased by the financial institution from money market mutual funds" and expanding it to include a "wider range of securities, including municipal variable rate demand notes (VRDNs) and bank certificates of deposit" to facilitate the flow of credit to municipalities, (e) establishing two new facilities—Primary Market Corporate Credit Facility (PMCCF) and Secondary Market Corporate Credit Facility (SMCCF) to provide liquidity and credit support to large employers, and (f) establishing a

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ADAM SMITH AND OUR PROSOCIALITY

By John R. Stinespring, Ph.D.

Dear readers,

We at the *Tampa Bay Economy* wish you and your families well. Normally your editor would be dutifully collecting and analyzing data on our local economy to create his forecast. Covid-19, however, nullifies even the most sophisticated of extrapolations. Normally, after building that forecast, your editor would be presenting it in April at the University of Tampa's annual Adam Smith Breakfast. This also is not to be. Yet the current level of anxiety and uncertainty makes this an apt time to consider the words of our breakfast's namesake. Though Adam Smith is considered the founder of economics, he was first and foremost a professor of moral philosophy. The first of his two books, *The Theory of Moral Sentiments* (*TMS*), examines the proper balance of our selfish and selfless behavior; a balance that he thought necessary to maintain the interactions that bind a society together. His profound insights seem particularly instructive for a society engaged in social distancing

The very first line of *TMS* states the tradeoff. "How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it." For a vivid, and strangely-current, example, Smith asks us to consider how a "man of humanity" would respond to the death of millions of Chinese from a devastating event whose effects would ripple throughout the world. The man, assumed to have no personal connection to China, would "first of all, express very strongly his sorrow for the misfortune… make many melancholy reflections upon the precariousness of human life…and enter into many reasonings concerning the effects which this disaster might produce upon…the trade and business of the world in general." Smith suggests that after "these humane sentiments had been once fairly expressed, he would pursue his business or his pleasure, take his repose or his diversion, with the same ease and tranquility, as if no such accident had happened." Perhaps even worse, "provided he never saw them, he will snore with the most profound security over the ruin of a hundred millions of his brethren." Yet how would this "man of humanity" be affected by a small misfortune of his own? If he were told that he would lose his little finger the next day—what Smith deemed a "paltry misfortune" in his day and age—he would not sleep a wink. The "destruction of that immense multitude seems plainly an object less interesting to him, than this paltry misfortune of his own."

Ideologues who wish to use Smith as a political mouthpiece for their cause appear to stop reading at this point. They combine these quotes with a reference to the invisible hand of free markets wherein Smith notes that self-interest, under certain circumstances, may be channeled to the societal good. Armed with their surface understanding they place the simplistic slogan "greed is good" into the mouth of their caricature of Smith.

But Smith was an astute and subtle thinker. After what appears a damning review of our character, he asks the follow-up question: if it were under our control, would we allow the loss of our Chinese brethren in return for the gain of our finger? Would we sacrifice the latter to prevent the former? Smith's answer is an unequivocal "no." "The world, in its greatest depravity and corruption, never produced such a villain as could be capable of entertaining it."

> *"How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it."*
>
> *- The Theory of Moral Sentiments*

How is it that our "active principles" are so generous and noble when our passive feelings appear so selfish and sordid? It is an innate prosociality that nature has imbued in us. It promotes the "two great purposes of nature, the support of the individual, and the propagation of the species." The selfish instinct is necessary to sustain ourselves, while the selfless instinct sustains the group. The benefits of acting prosocially are obvious to us when we stop to consider their overall effects. Reason is the means by which we understand and assess our virtuous acts. Reason, however, is motivationally inert. One rarely calculates the costs and benefits of rescuing the drowning person, but instead just feels compelled. The genius of Nature, Smith claims, is that it endowed us with an "appetite" for prosociality and the virtue that is often required to achieve it. That is, achieving it, striking the proper balance, just "feels right." It feels proper. Propriety is the term Smith used for this balance.

As any parent knows, however, children aren't born with a surplus of selflessness. It must be cultivated. Smith's explication aligns with recent studies from cognitive and social psychologists (read Paul Bloom's book *Just Babies*) that find that the seeds of prosociality are present at birth but are improved upon and expanded with age and experience. They manifest themselves in what becomes a conscience, a compassionate, though fair, judge within us, what Smith called our impartial spectator. For the child, this inner arbiter judges an action as right or wrong from their own perspective. As they age and interact with others, they expand their perspective to include that of the person being acted upon (How would I feel if that were done to me?). As adults we learn to take the perspective of an imaginary spectator who views both sides (What if everyone were to behave that way?). At our best, our impartial spectator is completely unbiased towards either side and accepts the relevant information from both sides. The impartial spectator strikes the proper balance and reminds us that we are merely one of the multitude: no better and no worse than anyone else.

Adam Smith
1723-1790

The impartial spectator is activated when we are about to act in a way that will impact others. Smith's examples range from the everyday to the existential. Consider the runner who is pleased to win the race because his competitors stumble, but who would never attempt to trip them in order to win. The person who is envious of his colleague's promotion, but would not dream of actively thwarting it. The soldier who is saddened, but not grief-stricken, upon hearing

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Adam Smith and Our Prosociality

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of the death of his esteemed commander, but would nonetheless have given his own life on the battlefield to save him. And yes, the majority of us who would accept the loss of our finger to prevent the death of millions, though they be halfway around the world and completely unknown to us.

This virtue and prosociality simply lie dormant until called upon by our impartial spectator. What is the reward or motivation that activates them, that satiates this appetite that nature gave us? How is it that our impartial spectator internalizes our externalities? It is our enjoyment of praise and praiseworthiness. Our desire not just to be loved, but to be worthy of that love. Our fear not just of being condemned by others, but being worthy of their condemnation. Prosociality is manifest in our appetite for praise; virtue is manifest in our appetite for praiseworthiness. We don't simply want to receive rewards, we want to earn them. It is the effort, struggle and earning that give meaning to the reward. As Smith says, it is the praiseworthiness of an action that gives the praise we receive its luster. The person who praises us for an action we did not perform, praises someone else. Whether it be making an honest profit or donating to charity, it is not the self-regarding praise but the other-regarding praiseworthiness that ultimately motivates and sustains virtuous behavior.

Most of us know this instinctively. As individuals, we exhibit virtues everyday when we help the elderly person who has dropped her groceries, or help one group of strangers push another stranger's car out of the snow, or help our friend change his flat tire along the side of the highway. More extraordinary exhibitions can move us to tears, as when the "Subway Samaritan" in New York jumped into the path of an oncoming train to shield the body of a man who had fallen onto the tracks, or when Uber drivers in California drove into burning neighborhoods to rescue people.

We guard our sense of praiseworthiness so closely that we abhor any potential tainting of it. If the elderly shopper praises us for assisting and then kindly makes out a $5 check to us, our praiseworthiness is put into doubt. That is not why we helped, we assure her. She has missed the point. A well-meaning friend who rifled through his wallet to determine what was fair compensation for a changed tire doesn't compound our feeling of praise but instead degrades the altruistic act.

Behavioral economists understand this. In his book, *Predictably Irrational,* Dan Ariely tells the story of needy retirees who lacked important legal services and turned to the American Bar Association for assistance. Their representatives from the American Association of Retired Persons (AARP) failed to find attorneys who would provide their services at steep discounts. AARP, however, found more than enough attorneys when they offered the only reasonable price the lawyers would accept. Zero. When Nobel Laureate Richard Thaler interviewed one of the California Uber drivers and asked how much he would accept to pick up people in the fires, the driver answered emphatically. "In that situation, I would want to offer rides for free." (See his book *Misbehaving.*)

As we fight this global pandemic, we see acts of virtue, big and small. Doctors and nurses coming out of retirement to assist on the front lines. Companies retrofitting their production for the provision of masks and ventilators. Restaurants providing free meals, free deliveries, and more to those in need. And everyone as an individual is being asked to make the enormous sacrifice of extreme social distancing. We are told this enormous individual cost will create relatively small individual benefits but whose cumulative impact is exponential. To motivate us, we have data on the spread and lethality of Covid-19 and its potentially catastrophic impact if health care resources are insufficient. The cost of a person neglecting social distancing is not just their own potential sickness and hospitalization, but the denial of that hospital bed to another. Reason, however, may be inadequate. Tempering the pull of selfishness may require a push of selflessness from our impartial spectator. It requires not just recognizing but internalizing the notion that individual actions can impact many. We must know and feel that we are one of a multitude: no better and no worse. The resulting sense of propriety, the feeling of praiseworthiness, of just "doing the right thing," may have to be motivation enough.

Write to Prof. Stinespring at
jstinespring@ut.edu

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Term Asset-Backed Securities Loan Facility (TALF) "to support the flow of credit to consumers and businesses. The TALF will enable the issuance of asset-backed securities (ABS) backed by student loans, auto loans, credit card loans, loans guaranteed by the Small Business Administration (SBA), and certain other assets" (source: Federal Reserve website). Additionally, the Federal Reserve has ramped up dollar-swap arrangements with 14 other central banks to deal with international dollar shortages (which is currently causing a sharp technical rise in the value of the American currency). Overall, the Federal Reserve appears to be meeting its founding mission to act as a "lender of last resort."

While monetary authorities address liquidity and credit strains, fiscal authorities are aiming to provide necessary aid to U.S. households and corporations by embracing a $2 trillion economic rescue package. The desperate need for a massive fiscal stimulus in the current crisis environment has, however, underscored the tenuous position that the U.S. government finds itself in due to its flagrant disregard for any sort of fiscal discipline during good economic times. The 2017-2018 fiscal stimulus measures (the Tax Cuts and Jobs Act of 2017 (TCJA) and the Bipartisan Budget Act (BBA) were signed into law on Dec. 22, 2017 and Feb. 9, 2018, respectively) now appear premature and short-sighted. The U.S. budget deficit was expected to exceed the trillion-dollar mark even before the coronavirus shock hit (as shown in Table 3-A, the budget deficit for the first five months of fiscal year 2020 was around $625 billion), and the gross debt level was around $23.3 trillion at the end of February 2020. Somewhere down the road, more enlightened policymakers will have to reckon with past fiscal profligacy. However, in the near term, relatively low yields on Treasury securities and the Federal Reserve's commitment to pursue "unlimited QE" program should ease borrowing costs for the US government. In an environment of collapsing private sector demand and a massive public health emergency, the time for extraordinary fiscal action is quite clear.

A massive yet targeted and time-limited fiscal stimulus (the first-round economic rescue package is in the range of $2 trillion) is clearly appropriate. Provision of lump-sum payments to Americans (excluding high-income individuals) is a necessary step despite the traditional lack of enthusiasm amongst some economists regarding the effectiveness of issuing one-time/temporary rebate checks. Reared on Milton Friedman's Permanent Income Hypothesis (PIH), some economists are dismissive of policies that lead only to temporary income changes. PIH suggests that changes in permanent income, rather than changes in temporary income, drives household spending patterns. However, recent empirical findings suggest that credit- and liquidity-constrained households do react strongly to changes in temporary income. In the current environment, a sizable lump-sum payment ($1,200 per adult and $500 per child) will help cash-strapped households pay bills and meet other financial obligations.

Given the rising cost associated with dealing with the health emergency, hospitals, borrowing-constrained municipalities and state governments (many facing balanced budget requirements) desperately need federal assistance. Covering the cost of testing for the virus infection and, if necessary, paying for the treatment of the uninsured may be required of local and state governments. Direct aid to state and local governments is essential for mitigating the impact of the coronavirus shock. The economic rescue package provides $150 billion boost to hospitals and other healthcare providers for purchase of much needed equipment and supplies. The U.S. government package has also allocated $500 billion to be used to back loans and assistance to large companies, and $340 billion to support state and local governments. Additional aid of over $375 billion for small businesses is likely to be appreciated by one of worst hit sectors of the American economy.

Table 3 – U.S. Federal Government Budget Statistics

A. Receipts, Outlays, and the Budget Deficit of the U.S. Federal Government
(Data Source: U.S. Treasury; Units: $ millions)

Period	Receipts	Outlays	Deficit
FY 2019			
Full Fiscal Year (Oct. 2018-Sept. 2019)	3,462,223	4,446,611	984,388
FY 2020			
Year-to-Date (Oct. 2019-Feb. 2020)	1,366,750	1,991,272	624,522

B. Revenue Sources for the U.S. Federal Government – FY 2019
(Data Source: Congressional Budget Office; Units: $ Billions)

Individual Income Taxes	1,718
Payroll Taxes	1,243
Corporate Income Taxes	230
Other	271
Total	**3,462**

Several measures have been included in the government aid package to deal with the expected spike in the number of unemployed. While a few in the Trump Administration had initially suggested eliminating payroll taxes altogether, it is worth keeping in mind that such taxes are the second largest source of revenue for the U.S. federal government (see Table 3-B). Sensibly, the $2 trillion economic rescue package includes an "employee retention" tax credit that's expected to provide $50 billion to companies that retain employees on payroll and cover 50% of workers' paychecks. Additionally, companies would also be able to defer payment of Social Security payroll tax. The decision to include a program to allow employers to furlough their workers (which allows workers to stay on the payrolls and maintain their existing employer-provided healthcare plans) and have the U.S. government help cover part of the salary is a step in the right direction. Extending unemployment insurance programs and bolstering insurance payouts by $600 per week will help mitigate the challenges facing newly unemployed workers.

Given the costs associated with the above discussed measures, the budget deficit is likely to exceed $3 trillion for FY2020. Yet, given the constraints facing monetary authorities and the nature of the shocks simultaneously hitting the economy, it is prudent to err on the side of doing more rather than less on the fiscal policy front. In the midst of a rare confluence of events, it is time for a unified national and global response to mitigate what is likely to be an extremely painful (though temporary) economic and financial shock. In his 1936 treatise, *The General Theory of Employment, Interest and Money*, John Maynard Keynes noted that "even apart from the instability due to speculation, there is the instability due to the characteristic of human nature that a large proportion of our positive activities depend on spontaneous optimism rather than on a mathematical expectation, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities."

Write to Prof. Jayakumar at
vjayakumar@ut.edu