

International Association of Risk and Compliance Professionals (IARCP)
1200 G Street NW Suite 800, Washington DC, 20005-6705 USA
Tel: 202-449-9750 Web: www.risk-compliance-association.com



Monday, May 3, 2021

Top 10 risk and compliance related news stories and world events that (for better or for worse) shaped the week's agenda, and what is next

Dear members and friends,

The Financial Stability Board's *peer reviews* are always interesting. FSB members have the opportunity to engage in dialogue with their peers and to share lessons and experiences.



Thematic peer reviews focus on the implementation across the FSB membership of policies or standards agreed within the FSB, with particular attention to consistency in crosscountry implementation and the effectiveness of the policy or standard in achieving the intended results.

Country peer reviews focus on the implementation and effectiveness of financial sector standards and policies agreed within the FSB in achieving the desired outcomes in a specific member jurisdiction.

Today we have the *Peer Review of the United Kingdom*.

The FSA was divided in 2013 into the Prudential Regulation Authority (PRA, within the Bank of England) and the Financial Conduct Authority (FCA). These are the competent authorities for supervising compensation policies and practices.

The PRA is responsible for the prudential regulation and supervision of around 1,500 deposit takers (banks, building societies and credit unions), insurance companies and designated investment firms. The FCA is the prudential supervisor for another 49,000 firms and is the conduct regulator for nearly 60,000 financial firms, including the firms prudentially supervised by the PRA (“dual-regulated firms”).

In order to prioritise activities, the FCA focuses on the key drivers of culture within firms, including a firm’s approach to rewarding and incentivising staff; the PRA prioritises firms with the potential to adversely impact the UK’s financial system.

This is an interesting approach. You can read more at number 4 below. Welcome to the top 10 list.

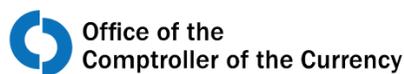
Best regards,

George Lekatis

George Lekatis
President of the IARCP
1200 G Street NW Suite 800,
Washington DC 20005, USA
Tel: (202) 449-9750
Email: lekatis@risk-compliance-association.com
Web: www.risk-compliance-association.com
HQ: 1220 N. Market Street Suite 804,
Wilmington DE 19801, USA
Tel: (302) 342-8828

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Fed's "Racism and the Economy" series examines racism's impact on the economics profession

Identifies shortcomings, proposes solutions to increase diversity and equity in economics



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Masks Under the Microscope

Viewed under a microscope, mask fabrics are complex, varied and beautiful.



Number 9 (Page 37)

Heating up High Performance Computing with Low Temperature Integrated Circuits

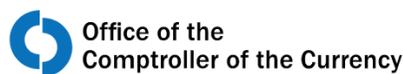
Program aims to develop very low temperature device technology to overcome power efficiency limitations in high-performance computing



Number 10 (Page 40)

Russian Foreign Intelligence Service Exploiting Five Publicly Known Vulnerabilities to Compromise U.S. and Allied Networks



*Number 1***Deputy Comptroller for Market Risk Policy Testifies on LIBOR Transition**

Deputy Comptroller for Market Risk Policy Kevin Walsh testified during a hearing before the U.S. House Financial Services Subcommittee on Investor Protection, Entrepreneurship and Capital Markets regarding the upcoming cessation of the London Interbank Offered Rates (LIBOR).

Oral Statement of Kevin P. Walsh Deputy Comptroller for Market Risk Policy Office of the Comptroller of the Currency Before the Subcommittee on Investor Protection, Entrepreneurship and Capital Markets of the Committee on Financial Services U.S. House of Representatives.

Chairman Sherman, Ranking Member Huizenga, and members of the Subcommittee, thank you for the opportunity to discuss the OCC's work to ensure the large, midsize, and community banks we supervise are prepared for the cessation and replacement of the London Interbank Offered Rates or LIBOR.

I am Kevin Walsh, Deputy Comptroller for Market Risk Policy. I am the OCC's ex-officio member of the Alternative Reference Rate Committee, oversee the agency's representation on other committees associated with LIBOR's cessation, and oversee the development and interpretation of policy and guidance related to market risk facing the federal banking system.

The OCC has worked closely with the institutions we supervise to ensure their preparedness since 2018.

To avoid the risk of market disruptions, prolonged litigation, and adverse financial impacts, the OCC has stressed to banks we supervise the importance of adequate transition planning and successfully executing those plans before LIBOR ceases to be reported.

The OCC's mission is to ensure that the institutions we charter and supervise operate in a safe and sound manner and treat all customers fairly.

Rather than endorse any specific replacement rate—including the Secured Overnight Financing Rate or SOFR—we want to ensure that banks have the flexibility to determine LIBOR’s successor rate or rates as may be most appropriate for the continued operation of their business model and risk appetite and the function that rate supports, in a safe and sound manner.

Starting in 2018, as part of our ongoing outreach sessions with bank CEOs, CFOs, Chief Risk Officers, and Bank Directors, we included discussions of LIBOR’s cessation and encouraged them to consider their exposures, risk tolerances, and mitigation plans.

We first mentioned the need for LIBOR transition plans in our Semiannual Risk Perspective that year.

Since then, we have published several bulletins and guidance documents that set forth our expectations for bank transition activities.

In November 2020, the OCC published a joint letter with the Federal Reserve and the FDIC that reiterated that a bank may use any reference rate it determines to be appropriate for its business model and customer needs.

That month, the OCC and other banking regulators clarified expectations that banks must stop creating new LIBOR exposures by the end of 2021, with few exceptions.

To read more:

<https://www.occ.treas.gov/news-issuances/congressional-testimony/2021/ct-occ-2021-46-oral.pdf>

<https://www.occ.treas.gov/news-issuances/congressional-testimony/2021/ct-occ-2021-46-written.pdf>



Number 2

The End of LIBOR: Transitioning to an Alternative Interest Rate Calculation for Mortgages, Student Loans, Business Borrowing, and Other Financial Products

Mark Van Der Weide, General Counsel, before the Subcommittee on Investor Protection, Entrepreneurship, and Capital Markets, Committee on Financial Services, U.S. House of Representatives, Washington, D.C.



Chairman Sherman, Ranking Member Huizenga, and members of the subcommittee, thank you for the opportunity to appear today.

My testimony will discuss the importance of ensuring a smooth, transparent, and fair transition away from LIBOR (formerly known as the London interbank offered rate) to more durable replacement rates, as well as some of the challenges posed by this transition. Before I delve into those issues, however, it may be helpful to review how LIBOR is used and why it will be discontinued.

LIBOR measures the average interest rate at which large banks can borrow in wholesale funding markets for different periods of time, ranging from overnight to one month, three months, and beyond.

LIBOR is an unsecured rate that measures interest rates for borrowings that are made without collateral.

Over the past few decades, LIBOR became a benchmark rate used to set interest rates for commercial loans, mortgages, derivatives, and many other products. In total, U.S. dollar LIBOR is used in more than \$200 trillion of financial contracts worldwide.

By now the flaws of LIBOR are well documented. One of the fundamental problems is that LIBOR purported to be a representation of the actual funding costs of large banks in the London interbank market, but the evolution of that market over the years meant that, for many tenors, banks were estimating the likely cost of such funding rather than reporting the actual cost.

This increasing element of subjectivity and discretion, coupled with the mechanisms that had been adopted to aggregate various banks' inputs into

the determination of LIBOR, made the rate vulnerable to collusion and manipulation.

Particularly after the global financial crisis of 2008, as banks sharply reduced their reliance on wholesale unsecured funding, there were few actual funding transactions on which to base a rate for many tenors of LIBOR.

While banks are, of course, not required to price their credit as a direct function of their cost of funding or on any amalgam of actual transaction data, the LIBOR mechanism—by purporting to be a measure of such costs even though there were not sufficient transactions to justify that perception—had become potentially misleading to many of those relying on it for credit pricing and other decisions.

Over time, with a large number of contracts referencing a thinly traded rate, the incentive to manipulate LIBOR grew and actual manipulation of LIBOR abounded.

Following the exposure of these weaknesses, and the imposition of material legal penalties on a number of banks and individuals that engaged in misconduct related to the setting of LIBOR rates, the great majority of the banks that had provided submissions to be used in the setting of LIBOR (the so-called panel banks) determined that they would not continue participating in the process.

This was not the result of a regulatory or legal requirement to end LIBOR. It was a private sector decision to stop providing what had always been a completely voluntary service, given the firms' assessment of the costs and benefits of doing so.

While regulators are appropriately focusing on whether financial firms have prepared themselves for the date when the panel banks have said they will no longer provide LIBOR, the decision to end LIBOR itself has not been a governmental decision, but a private sector development.

Last month, LIBOR's regulator in the United Kingdom announced that the one-week and two-month U.S. dollar LIBOR term rates will cease to be published at the end of 2021, while overnight and other LIBOR term rates will cease to be published on a representative basis in mid-2023.

This definitive announcement about the end of panel-based LIBOR underscores the importance of transitioning away from this moribund benchmark rate.

Efforts to Transition Away from LIBOR

Market participants, regulatory agencies, consumer groups, and other stakeholders have put in a great deal of work to prepare for life after LIBOR. Beginning in 2013, the domestic Financial Stability Oversight Council and the international Financial Stability Board expressed concern that the decline in unsecured short-term funding by banks could pose serious structural risks for unsecured benchmarks like LIBOR.

To mitigate these risks and promote a smooth transition away from LIBOR, the Federal Reserve convened the Alternative Reference Rates Committee (ARRC) in November 2014.

Recognizing that the private sector must drive this transition, the ARRC's voting members are private-sector firms. The Federal Reserve and the other agencies testifying today are ex-officio members of the ARRC.

The ARRC set about to identify alternative reference rates that were rooted in transactions from an active and robust underlying market.

In June 2017, the ARRC identified the Secured Overnight Financing Rate (SOFR) as its recommended alternative to U.S. dollar LIBOR. SOFR is a broad measure of the cost of borrowing cash overnight, collateralized by Treasury securities.

The Federal Reserve Bank of New York publishes SOFR each morning. Unlike LIBOR, SOFR is based on a market with a high volume of underlying transactions—regularly around \$1 trillion daily.

The ARRC developed a multi-step plan in October 2017 to facilitate the transition from LIBOR to SOFR.

The Federal Reserve and other agencies also sponsored a series of workshops with lenders and borrowers that focused on the use of credit-sensitive alternative reference rates for loans.

Relatedly, the Federal Reserve, Office of the Comptroller of the Currency (OCC), and Federal Deposit Insurance Corporation (FDIC) issued a statement last year to emphasize that a bank may use any reference rate for its loans that the bank determines to be appropriate for its funding model and customer needs.

The statement also noted, however, that a bank's loan contracts should include robust fallback language that provides for a clearly defined

alternative reference rate to be used if the initial reference rate is discontinued.

Supervisory Efforts

Beginning in 2018, Federal Reserve staff began outreach to supervised institutions and examiners to raise awareness about, and encourage preparation for, the transition away from LIBOR.

In 2019, we established a LIBOR Transition Working Group to coordinate monitoring of the transition and develop supervisory plans to assess banks' preparation efforts.

In November 2020, the Federal Reserve, OCC, and FDIC sent a letter to the banking organizations that we regulate, noting that there are safety and soundness risks associated with the continued use of U.S. dollar LIBOR in new transactions after 2021.

Accordingly, we have encouraged supervised entities to stop using LIBOR in new contracts as soon as practicable and, in any event, by the end of this year.

Federal Reserve Vice Chair for Supervision Randal Quarles emphasized in a recent speech that banking firms should be aware of the intense supervisory focus the Federal Reserve is placing on the LIBOR transition, and especially on plans to end issuance of new LIBOR contracts by year-end.

Legacy Contracts

A key question is whether existing LIBOR-based contracts (legacy contracts) can seamlessly transition to alternative reference rates when LIBOR ends. The ARRC recently estimated that 35 percent of legacy contracts will not mature before mid-2023.

Some of these legacy contracts have workable fallback language to address the end of LIBOR, but others do not. For example, most business loans have workable fallback language—by their terms, business loans generally fall back to an alternative floating rate, such as the prime rate.

Similarly, most derivatives are governed by a master agreement published by the International Swaps and Derivatives Association (ISDA), and ISDA has published a "protocol" that allows derivative counterparties to amend their master agreements, on a multilateral basis, so that their derivative contracts fall back to a floating SOFR-based rate for counterparties that adhere to the protocol.

Conversely, many floating-rate notes and securitizations have problematic fallback language—generally, these contracts convert to fixed-rate instruments at the last published value of LIBOR.

Moreover, the rate terms in floating-rate notes and securitizations can typically be changed only with the unanimous consent of all noteholders, which typically would be difficult to secure.

The end of LIBOR may result in significant litigation. For example, if a legacy contract converts to a fixed rate when LIBOR ends, a party disadvantaged by that conversion might request that a court reform the contract by substituting an alternative floating rate for LIBOR.

Parties also might request that a court reform or void a legacy contract that lacks any fallback language if the parties cannot agree bilaterally on a successor rate.

Similarly, in instances where a legacy contract allows a person to select a replacement rate when LIBOR ends, a party disadvantaged by the replacement rate might argue that the manner in which another person—for example, a bond trustee—selected the replacement rate violates the implied covenant of good faith and fair dealing.

Chair Powell and Vice Chair Quarles have publicly stated their support for federal legislation to mitigate risks related to legacy contracts. Federal legislation would establish a clear and uniform framework, on a nationwide basis, for replacing LIBOR in legacy contracts that do not provide for an appropriate fallback rate.

Federal legislation should be targeted narrowly to address legacy contracts that have no fallback language, that have fallback language referring to LIBOR or to a poll of banks, or that convert to fixed-rate instruments.

Federal legislation should not affect legacy contracts with fallbacks to another floating rate, nor should federal legislation dictate that market participants must use any particular benchmark rate in future contracts. Finally, to avoid conflict of laws problems, federal legislation should pre-empt any outstanding state legislation on legacy LIBOR contracts.

Thank you. I look forward to your questions on this important matter.



Number 3

SEC Awards Over \$50 Million to Joint Whistleblowers Awards This Fiscal Year Exceed Quarter of a Billion Dollars



The Securities and Exchange Commission announced an award of over \$50 million to joint whistleblowers whose information alerted SEC staff to violations that involved highly complex transactions and would have been difficult to detect without their information.

The joint whistleblowers provided exemplary assistance to the SEC staff during the investigation, including meeting with staff numerous times and providing voluminous detailed documents. The information provided by these individuals resulted in the return of tens of millions of dollars to harmed investors.

“Today’s award is the second largest in the history of the program, reflecting the tremendous contribution of these joint whistleblowers to our ability to recover funds for harmed investors,” said Jane Norberg, Chief of the SEC’s Office of the Whistleblower. “The SEC has now awarded over a quarter of a billion dollars to whistleblowers in the first seven months of this fiscal year alone, demonstrating the tremendous value of whistleblowers to our enforcement program.”

The SEC has now awarded approximately \$812 million to 151 individuals since issuing its first award in 2012.

All payments are made out of an investor protection fund established by Congress that is financed entirely through monetary sanctions paid to the SEC by securities law violators.

No money has been taken or withheld from harmed investors to pay whistleblower awards.

Whistleblowers may be eligible for an award when they voluntarily provide the SEC with original, timely, and credible information that leads to a successful enforcement action.

Whistleblower awards can range from 10 percent to 30 percent of the money collected when the monetary sanctions exceed \$1 million.

As set forth in the Dodd-Frank Act, the SEC protects the confidentiality of whistleblowers and does not disclose any information that could reveal a whistleblower's identity.

For more information about the whistleblower program and how to submit a tip, visit www.sec.gov/whistleblower



Number 4

Peer Review of the United Kingdom

*Main findings*

The Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) (the Authorities) have implemented financial sector compensation reforms in the UK that are consistent with the P&S.

The initial focus was on the banking sector but over time the Authorities have increasingly implemented the P&S in the insurance and asset management sectors.

For all three sectors the Authorities have adopted a risk-based and proportional regulatory and supervisory approach.

In addition, there is strong cooperation and information-sharing between the PRA and FCA and clear communication with the industry about their remuneration expectations.

Such communication, including through the publication of letters to Remuneration Committee Chairs, has helped firms understand and embed the requirements over time.

Other initiatives such as the Senior Managers and Certification Regime (SM&CR), the FCA 5 Conduct Questions Programme and research published on conduct and culture complement the remuneration regime.

In combination with the SM&CR, the remuneration regime has helped firms become more disciplined in mapping responsibilities and resulted in greater consistency and transparency on acceptable remuneration practices.

With implementation well-advanced, the Authorities are increasingly focused on evaluating the effectiveness of the regime and require firms to periodically review the design and implementation of their remuneration policies.

The UK is the first FSB jurisdiction to conduct an effectiveness review with a focus on performance adjustment, including the use by firms of tools such as clawback, malus and in-year adjustment.

In parallel, the PRA reviewed the SM&CR regime for banks and insurers, publishing the results in December 2020.

Some of the Authorities' approaches to implement the P&S are at the forefront of FSB members' work on compensation and can serve as examples of good practice for other jurisdictions to consider.

These include setting expectations through public communication to Remuneration Committee Chairs; a supervisory approach that focuses on close interaction between prudential and conduct rules and reinforces accountability with links to compensation outcomes; and a focus on evaluating the regime's effectiveness.

At the same time, steps can be taken to further strengthen the financial sector compensation framework in a few areas.

These include: reviewing the interaction between the UK's remuneration regimes and the SM&CR; improving the efficiency of data collection; considering other supervisory approaches for assessing the effectiveness of the regime; and providing additional guidance to the insurance sector.

Review the interaction between the SM&CR and compensation

The remuneration and SM&CR regimes were set up with different, albeit complementary, objectives, and there has been progress to date in their concurrent application.

The linkages between the two regimes provide the Authorities with comfort that accountability has practical consequences that contribute to prudent risk taking behaviour.

However, the link could be made more clear. In some instances, the application of performance adjustment tools to material risk takers (MRTs) who are also Senior Management Functions (SMFs) may be applied inconsistently between firms.

MRTs and SMFs have separate but overlapping identification criteria and, as reported by some industry participants, this could generate confusion and contribute to a general reluctance towards proactive risk taking ("a culture of fear").

The Authorities should consider further strengthening the alignment between the two regimes.

Improving the efficiency of data collection

Remuneration data collection differs based on the size and type of firms, in line with the Authorities' proportionate approach to regulation and supervision.

With regard to regulatory reporting, the largest (level one) banks and investment firms must provide remuneration data on their MRTs across all business areas while level one, two and three banking and investment firms provide data on all employees with total remuneration of €1 million or more per year.

Additionally, the Authorities provide firms with self-assessment templates and tables, called Remuneration Policy Statements (RPS).

Supervisors expect level one banks and investment firms to submit the data on their remuneration policies and practices by completing these templates annually.

This can require a large amount of information; indeed some firms indicate they have to prepare summaries for Authorities overlaying the RPS, or that rarely is the information submitted to the Authorities also useful for internal purposes.

In addition, the RPS are analysed manually by the Authorities.

However, with increased attention by the Authorities on understanding the effects and effectiveness of the regime, data needs will change, including for the need to examine trends across a larger number of players.

The Authorities should consider streamlining and automating the data collection and analysis for level one banks and investment firms.

They could also consider collecting remuneration data from a broader range of firms whilst having regard to the cost and complexity for all stakeholders, including minimising the burden on firms where possible.

This would enable the Authorities to conduct a sample-based review of the remuneration arrangements across a broader range of firms to support a wider view of industry practices.

For example, they might consider asking level two and three firms to submit the RPS periodically (such as every three to four years).

The ongoing work by the Authorities to implement a new data collection platform and streamline various aspects of the reporting process offers an opportunity to review the cost, complexity and benefits of information collected for firms of varying sizes.

To read more: <https://www.fsb.org/wp-content/uploads/P140421.pdf>



Number 5

From January 2019 to April 2020

Cyber espionage

ENISA Threat Landscape



Cyber espionage is considered both a threat and a motive in the cybersecurity playbook. It is defined as ‘the use of computer networks to gain illicit access to confidential information, typically that held by a government or other organisation’.

In 2019, many reports revealed that global organisations consider cyber espionage (or nation-state-sponsored espionage) a growing threat affecting industrial sectors, as well as critical and strategic infrastructures across the world, including government ministries, railways, telecommunication providers, energy companies, hospitals and banks.

Cyber espionage focuses on driving geopolitics, and on stealing state and trade secrets, intellectual property rights and proprietary information in strategic fields. It also mobilises actors from the economy, industry and foreign intelligence services, as well as actors who work on their behalf. In a recent report, threat intelligence analysts were not surprised to learn that 71% of organisations are treating cyber espionage and other threats as a ‘black box’ and are still learning about them.

In 2019, the number of nation-state-sponsored cyberattacks targeting the economy increased and it is likely to continue this way. In detail, nation-state-sponsored and other adversary-driven attacks on the Industrial Internet of Things (IIoT) are increasing in the utilities, oil and natural gas (ONG), and manufacturing sectors.

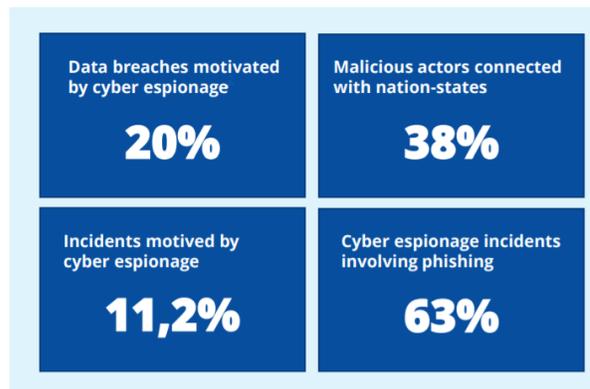
Furthermore, cyberattacks conducted by advanced persistent threat (APT) groups indicate that financial attacks are often motivated by espionage.

Using tactics, techniques and procedures (TTPs) akin to those of their espionage counterparts, groups such as the Cobalt Group, Carbanak and FIN7 have allegedly been targeting large financial institutions and restaurant chains successfully.

- The European Parliament’s Committee of Foreign Affairs called upon Member States to establish a cyber-defence unit and to work together on their common defence. It stated that ‘the Union’s strategic environment has been deteriorating ... in order to face the multiple

challenges that directly or indirectly affect the security of its Member States and its citizens; whereas issues that affect the security of EU citizens include: armed conflicts immediately to the east and south of the European continent and fragile states; terrorism – and in particular Jihadism –, cyberattacks and disinformation campaigns; foreign interference in European political and electoral processes’.

- Threat actors motivated by financial, political, or ideological gain will increasingly focus attacks on supplier networks with weak cybersecurity programs. Cyber espionage adversaries have slowly shifted their attack patterns to exploiting third- and fourth-party supply chain partners.



To read more:

<https://www.enisa.europa.eu/publications/enisa-threat-landscape-2020-cyber-espionage>



Number 6

The Federal Reserve's New Framework and Outcome-Based Forward Guidance

Vice Chair Richard H. Clarida, at "SOMC: The Federal Reserve's New Policy Framework" a forum sponsored by the Manhattan Institute's Shadow Open Market Committee, New York, New York



On August 27, the Federal Open Market Committee (FOMC) unanimously approved a revised Statement on Longer-Run Goals and Monetary Policy Strategy, and, at its September and December FOMC meetings, the Committee made material changes to its forward guidance to bring it into line with this new policy framework.

Before I discuss the new framework and the policy implications that flow from it, I will first review some important changes in the U.S. economy that motivated the Committee to assess ways we could refine our strategy, tools, and communication practices to achieve and sustain our goals in the economy in which we operate today and for the foreseeable future.

Shifting Stars and the End of "Copacetic Coincidence"

Perhaps the most significant change in our understanding of the economy since the Federal Reserve formally adopted inflation targeting in 2012 has been the substantial decline in estimates of the neutral real interest rate, r^* , that, over the longer run, is consistent with our maximum-employment and price-stability mandates.

Whereas in January 2012 the median FOMC participant projected a longer-run r^* of 2.25 percent and a neutral nominal policy rate of 4.25 percent, as of March 2021, the median FOMC participant projected a longer-run r^* equal to just 0.5 percent, which implies a neutral setting for the federal funds rate of 2.5 percent.

Moreover, as is well appreciated, the decline in neutral policy rates since the Global Financial Crisis (GFC) is a global phenomenon that is widely expected by forecasters and financial markets to persist for years to come (Clarida, 2019).

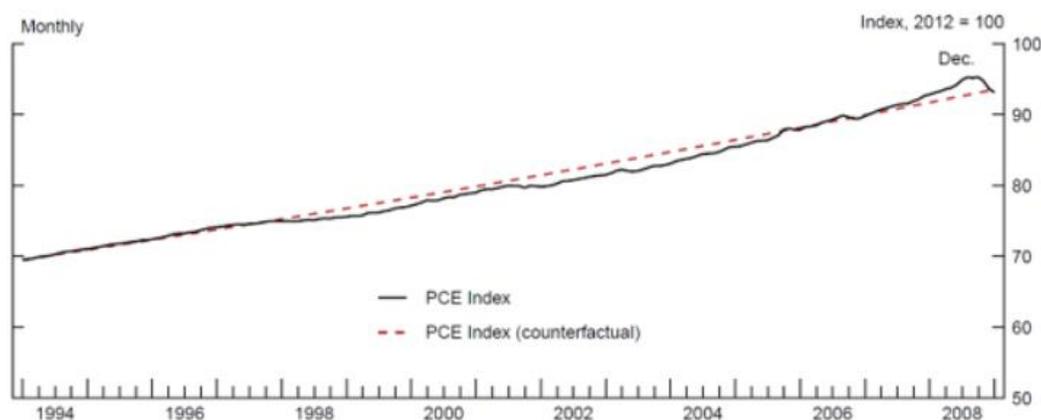
The substantial decline in the neutral policy rate since 2012 has critical implications for monetary policy because it leaves the FOMC with less conventional policy space to cut rates to offset adverse shocks to aggregate demand.

This development, in turn, makes it more likely that recessions will impart elevated risks of more persistent downward pressure on inflation and inflation expectations as well as upward pressure on unemployment that the Federal Reserve's monetary policy should—in design and implementation—seek to offset throughout the business cycle and not just in downturns themselves.

With regard to inflation expectations, there is broad agreement that achieving price stability on a sustainable basis requires that long-run inflation expectations be well anchored at the rate of inflation consistent with the price-stability goal.

The pre-GFC academic literature (Clarida, Galí, and Gertler, 1999; Woodford, 2003) derived the important result that a credible inflation-targeting monetary policy strategy that is not constrained by the effective lower bound (ELB) can deliver, under either rational expectations or linear least-squares learning (Bullard and Mitra, 2002), inflation expectations that themselves are well anchored at the inflation target.

Figure 1. U.S. Personal Consumption Expenditures Price Index



Note: The counterfactual U.S. Personal Consumption Expenditures Price Index (PCE Index) measures the value if inflation grew at 2 percent annually.
Source: Bloomberg Finance LP; Federal Reserve Board staff calculations.

In other words, absent a binding ELB constraint, a policy that targets actual inflation in these models delivers long-run inflation expectations well anchored at the target "for free." And, indeed, in the 15 years before December 2008, when the federal funds rate first hit the ELB—a period when, de facto, if not de jure the Federal Reserve conducted a monetary

policy that was interpreted to be targeting an inflation rate of 2 percent (Clarida, Galí, and Gertler, 2000)—personal consumption expenditures (PCE) inflation averaged very close to 2 percent (see figure 1).

But this "copacetic coincidence" no longer holds in a world of low r^* in which adverse aggregate demand shocks drive the economy in downturns to the ELB.

In this case, economic analysis indicates that flexible inflation-targeting monetary policy cannot be relied on to deliver inflation expectations that are anchored at the target but instead will tend to deliver inflation expectations that, in each business cycle, become anchored at a level below the target (Mishkin, 2016).

This finding is the crucial insight in my colleague John Williams's research with Thomas Mertens (2019) and in the research of Bernanke, Kiley, and Roberts (2019).

This downward bias in inflation expectations under inflation targeting in an ELB world can in turn reduce already scarce policy space—because nominal interest rates reflect both real rates and expected inflation—and it can open up the risk of the downward spiral in both actual and expected inflation that has been observed in some other major economies.

Two other, related developments that have also become more evident than they appeared in 2012 are that price inflation seems empirically to be less responsive to resource slack, and that estimates of resource slack based on historically estimated price Phillips curve relationships are less reliable and subject to more material revision than was once commonly believed.

For example, in the face of declining unemployment rates that did not result in excessive cost-push pressure to price inflation, the median of the Committee's projections of u^* —the rate of unemployment consistent in the longer run with the 2 percent inflation objective—has been repeatedly revised lower, from 5.5 percent in January 2012 to 4 percent as of the March 2021 Summary of Economic Projections (SEP).

In the past several years of the previous expansion, declines in the unemployment rate occurred in tandem with a notable and, to me, welcome increase in real wages that was accompanied by an increase in labor's share of national income, but not a surge in price inflation to a pace inconsistent with our price-stability mandate and well-anchored inflation expectations.

Indeed, this pattern of mid-cycle declines in unemployment coincident with noninflationary increases in real wages and labor's share has been evident

in the U.S. data since the 1990s (Clarida, 2016; Heise, Karahan, and Sahin, 2020; Feroli, Silver, and Edgerton, 2021).

The New Framework and Price Stability

I will now discuss the implications of the new framework for the Federal Reserve's price-stability mandate before turning to its implications for the maximum-employment mandate. Five features of the new framework and fall 2020 FOMC statements define how the Committee will seek to achieve its price-stability mandate over time.

First, the Committee expects to delay liftoff from the ELB until PCE inflation has risen to 2 percent and other complementary conditions, consistent with achieving this goal on a sustained basis, have also been met.

Second, with inflation having run persistently below 2 percent, the Committee will aim to achieve inflation moderately above 2 percent for some time in the service of keeping longer-term inflation expectations well anchored at the 2 percent longer-run goal.

Third, the Committee expects that appropriate monetary policy will remain accommodative for some time after the conditions to commence policy normalization have been met.

Fourth, policy will aim over time to return inflation to its longer-run goal, which remains 2 percent, but not below, once the conditions to commence policy normalization have been met.

Fifth, inflation that averages 2 percent over time represents an ex ante aspiration of the FOMC but not a time inconsistent ex post commitment.

As I highlighted in speeches at the Brookings Institution in November and the Hoover Institution in January, I believe that a useful way to summarize the framework defined by these five features is temporary price-level targeting (TPLT, at the ELB) that reverts to flexible inflation targeting (once the conditions for liftoff have been reached).

Just such a framework has been analyzed by Bernanke, Kiley, and Roberts (2019) and Bernanke (2020), who in turn build on earlier work by Evans (2012), Reifschneider and Williams (2000), and Eggertsson and Woodford (2003), among many others.

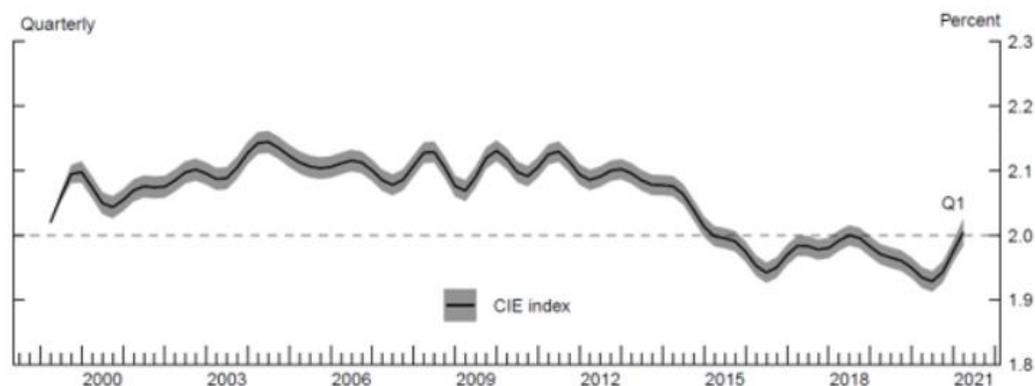
A policy that delays liftoff from the ELB until a threshold for average inflation has been reached is one element of a TPLT strategy. Starting with our September FOMC statement, we communicated that inflation reaching

2 percent is a necessary condition for liftoff from the ELB. TPLT with such a one-year memory has been studied by Bernanke, Kiley, and Roberts (2019).

The FOMC also indicated in these statements that the Committee expects to delay liftoff until inflation is "on track to moderately exceed 2 percent for some time." What "moderately" and "for some time" mean will depend on the initial conditions at liftoff (just as they do under other versions of TPLT), and the Committee's judgment on the projected duration and magnitude of the deviation from the 2 percent inflation goal will be communicated in the quarterly SEP for inflation.

Our new framework is asymmetric. That is, as in the TPLT studies cited earlier, the goal of monetary policy after lifting off from the ELB is to return inflation to its 2 percent longer-run goal, but not to push inflation below 2 percent. In the case of the Federal Reserve, we have highlighted that making sure that inflation expectations remain anchored at our 2 percent objective is just such a consideration. Speaking for myself, I follow closely the Fed staff's index of common inflation expectations (CIE)—which is now updated quarterly on the Board's website—as a relevant indicator that this goal is being met (see figure 2).

Figure 2. Estimated Index of Common Inflation Expectations



Note: The horizontal dashed line is marked at 2 percent. The common inflation expectations (CIE) index is projected onto the Survey of Professional Forecasters 10-year personal consumption expenditures inflation value. The shaded area denotes the 95 percent confidence interval.

Source: Ahn and Fulton (2020, 2021); authors' calculations.

Other things being equal, my desired pace of policy normalization post liftoff to return inflation to 2 percent would be somewhat slower than otherwise if the CIE index at the time of liftoff is below the pre-ELB level.

Our framework aims ex ante for inflation to average 2 percent over time but does not make a commitment to achieve ex post inflation outcomes that average 2 percent under any and all circumstances. The same is true for the TPLT studies I cited earlier. In these studies, the only way in which average inflation enters the policy rule is through the timing of liftoff itself.

Yet in stochastic simulations of the FRB/US model under TPLT with a one-year memory that reverts to flexible inflation targeting after liftoff, inflation does average very close to 2 percent (see the table).

Table 1. Stochastic Simulation Result of FRB/US Model under Model-Consistent Expectations

	ELB frequency (percent)	Mean duration of ELB (quarters)	Mean output gap	Mean inflation rate	RMSD of output gap	RMSD of inflation rate	Loss
1. Taylor	38.3	10.9	-1.1	1.2	3.5	2.2	17.2
2. Taylor (inertial)	33.6	20.7	-1.4	1.0	3.9	2.4	20.7
3. Flexible price-level target	32.6	8.5	-0.4	2.0	3.6	1.5	15.2
4. Flexible price-level target (inertial)	24.6	13.8	-0.6	2.0	4.4	1.5	21.8
5. Flexible temporary price-level target	17.6	12.9	0.3	2.4	3.4	1.6	14.5
6. Temporary price-level target	16.3	12.5	0.0	2.3	3.1	1.7	12.6
7. Temporary price-level target (3-year memory)	15.6	11.2	0.3	2.4	2.7	1.6	9.6
8. Temporary price-level target (1-year memory)	15.1	9.4	0.2	2.3	2.5	1.5	8.5
9. Reifschneider-Williams	28.1	10.1	0.2	2.1	2.4	1.6	8.0
10. Kiley-Roberts change rule	37.0	16.9	-0.1	2.1	1.9	1.4	5.7

Results are based on 500 simulations of 100 quarters each. $Loss = \frac{1}{N} \frac{1}{K} \sum_{j=1}^K \sum_{t=1}^N [(\pi_{t,j} - \pi^*)^2 + \hat{\gamma}_{t,j}^2]$ for t, j period-simulations. FRB/US is the Federal Reserve's principal simulation model; ELB is effective lower bound; RMSD is root mean square deviation.

Source: Bermanke, Kiley, and Roberts (2019); authors' calculations.

The model of Mertens and Williams (2019) delivers a similar outcome: Even though the policy reaction function in their model does not incorporate an ex post makeup element, it delivers a long-run (unconditional) average rate of inflation equal to target by aiming for a moderate inflation overshoot away from the ELB that is calibrated to offset the inflation shortfall caused by the ELB.

The New Framework and Maximum Employment

I turn now to the maximum-employment mandate. An important evolution in our new framework is that the Committee now defines maximum employment as the highest level of employment that does not generate sustained pressures that put the price-stability mandate at risk.

As a practical matter, this means to me that when the unemployment rate is elevated relative to my SEP projection of its long-run natural level, monetary policy should, as before, continue to be calibrated to eliminate such employment shortfalls, so long as doing so does not put the price-stability mandate at risk.

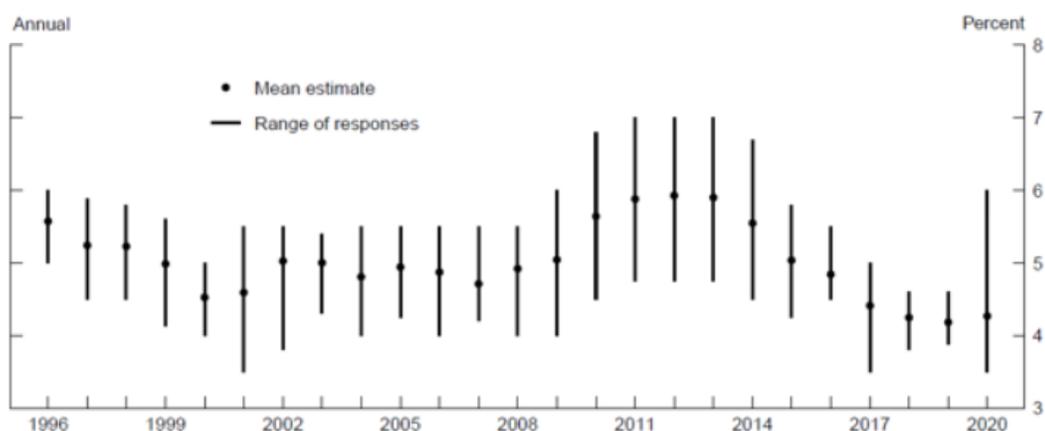
Indeed, in our September and subsequent FOMC statements, we indicated that we expect it will be appropriate to keep the federal funds rate in the current 0 to 25 basis point target range until inflation has reached 2 percent (on an annual basis) and labor market conditions have reached levels consistent with the Committee's assessment of maximum employment.

Moreover, in our December and subsequent FOMC statements, we have indicated that we expect to continue our Treasury and MBS purchases at least at the current pace until we have made substantial further progress toward achieving these dual mandate goals.

In our new framework, when in a business cycle expansion labor market indicators return to a range that in the Committee's judgment is broadly consistent with its maximum-employment mandate, it will be data on inflation itself that policy will react to, but, going forward, policy will not tighten solely because the unemployment rate has fallen below any particular econometric estimate of its long-run natural level.

Of note, the relevance of uncertainty about the natural rate of unemployment or the output gap for monetary policy reaction functions is a long-studied topic that remains important.¹² For example, Berge (2020) provides a discussion around the difficult task of estimating the output gap (see figure 3).

Figure 3. Survey of Professional Forecasters Estimates of the Natural Rate

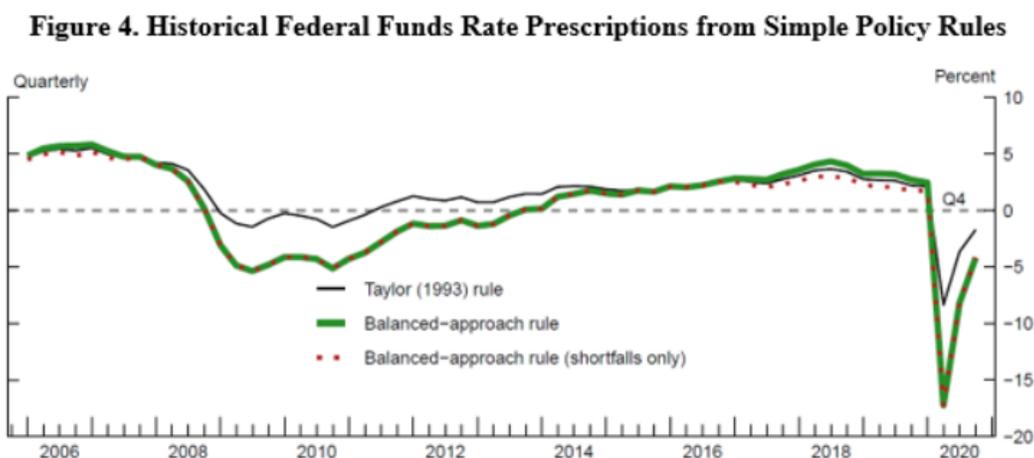


Source: Survey of Professional Forecasters.

These considerations have an important implication for the Taylor-type policy reaction function I consult.

Consistent with our new framework, the relevant policy rule benchmark I will consult once the conditions for liftoff have been met is an inertial Taylor-type rule with a coefficient of zero on the unemployment gap, a coefficient of 1.5 on the gap between core PCE inflation and the 2 percent longer-run goal, and a neutral real policy rate equal to my SEP projection of long-run r^* .

The most recent Monetary Policy Report features a box on policy rules, including a Taylor-type "shortfalls" rule in which the federal funds rate reacts only to shortfalls of employment from the Committee's best judgment of its maximum level but reverts to the rule previously described once that level of employment is reached (see figure 4).



Notes: The horizontal dashed line is marked at zero. The Taylor (1993) rule was suggested in John B. Taylor (1993), "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy*, vol. 39 (December), pp. 195–214. The balanced-approach rule was analyzed in John B. Taylor (1999), "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules* (Chicago: University of Chicago Press), pp. 319–41. The rules use historical values of the federal funds rate, core personal consumption expenditure inflation, and the unemployment rate. Quarterly projections of longer-run values for the federal funds rate and the unemployment rate are derived through interpolations of the biannual projections of the Blue Chip Economic Indicators. The longer-run value for inflation is taken as 2 percent.

Source: Federal Reserve Bank of Philadelphia; Wolters Kluwer, Blue Chip Economic Indicators; Federal Reserve Board staff estimates.

Concluding Remarks

In closing, I think of our new flexible average inflation-targeting framework as a combination of TPLT at the ELB, to which TPLT reverts once the conditions to commence policy normalization articulated in our most recent FOMC statement have been met.

In this sense, our new framework indeed represents an evolution, not a revolution, from the flexible inflation-targeting framework in place since

2012. Thank you very much for your time and attention, and I look forward to my conversation with Peter Ireland and Athanasios Orphanides.



*Number 7***Fed’s “Racism and the Economy” series examines racism’s impact on the economics profession**

Identifies shortcomings, proposes solutions to increase diversity and equity in economics



Last June, William Spriggs, advisor to the Minneapolis Fed’s Opportunity & Inclusive Growth Institute, chief economist for the AFL-CIO, and a professor at Howard University, penned a letter to fellow economists imploring the discipline to undertake an accounting of how deeply racism has affected the people and practice of economics.

Spriggs’ letter was a response to George Floyd’s killing by Minneapolis police, an event that spurred worldwide concern about racial disparities.

On Tuesday, just days after another Black man, Daunte Wright, was killed by a police officer, Spriggs joined economists from across the country and the Federal Reserve System to discuss racism, the economics profession, and the work that needs to be done to achieve greater diversity, expand avenues of inquiry, and better inform public policy.

The event is part of the “Racism and the Economy” series, launched by the 12 Federal Reserve Banks to examine structural racism, its impacts, and ways to dismantle it.

“There is a tendency to think that these problems are somebody else’s problems, that policing in predominantly Black communities is somebody else’s problem, that hate crimes against Asian Americans are somebody else’s problems, that if there is a failure of representation in the field of economics, that’s somebody else’s problem,” David Wilcox, a senior fellow at the Peterson Institute for International Economics, said at the April 13 event. “That’s the wrong view. It is our problem.”

As one of the largest employers of Ph.D. economists, the Federal Reserve is committed to addressing the problem. “Inclusivity must be part of our identity,” Esther George, president of the Kansas City Fed, stated in her opening remarks.

“Addressing today’s economic dynamics is a complex task. It will serve us well to invite new perspectives and new questions about old issues, to challenge dominant paradigms, group think, and even blind spots.”

Racism and the pipeline into economics

The first panel, moderated by New York Times reporter Jeanna Smialek, explored the causes and consequences of the underrepresentation of people of color in economics.

The profession is “unwelcoming,” panelists stated, a view borne out by data presented by Ebonya Washington, the Samuel C. Park Jr. professor of economics at Yale University, that showed the extent to which people of color are underrepresented among academic faculty, government staff, Ph.D. recipients, and B.A. graduates.

“Right from the beginning, we see shortfalls in representation,” Washington observed, as she and other panelists pointed out that many young people are unfamiliar with economics beyond a vague association with “banking” and “finance,” and therefore don’t see economics as a useful tool for understanding and confronting the social issues they see in their communities.

But the problem of underrepresentation goes beyond recruitment. It’s a problem of retention too. That means valuing work that looks at new questions and embraces new perspectives, said Judith Chevalier, the William S. Beinecke professor of finance and economics at Yale University’s School of Management, and Randall Akee, chair of the American Indian Studies Interdepartmental Program and associate professor of public policy at the University of California, Los Angeles.

A cultural change, all speakers emphasized, is essential. “We must recognize that we will lose our comparative advantage as researchers if we do not change the culture. This is an existential crisis for the profession,” Trevon Logan, the Hazel C. Youngberg trustees distinguished professor of economics at the Ohio State University, stated.

Racism and the practice of economics

The ways in which economics is unwelcoming to people of color extends to how the discipline studies race—when it studies it—by treating race as an exogenous variable rather than a social construct. Opening the second panel conversation, moderator Mary Daly, president of the San Francisco Fed, stated, “We’re going to talk about how the practice of economics, the very way we conduct our research, may in fact contribute to, perpetuate, some of the things we’ve seen that horrify us.”

The conversation identified a number of reasons why economics has trouble studying race well. One of them is that human behavior isn't as neat and orderly as the discipline's foundational assumptions suggest.

"Economics tends to focus on rationality and efficiency. So topics of race, of human behavior that may not be particularly rational or efficient, don't fit into the paradigm very well," Boston Fed President Eric Rosengren said in the closing panel.

Another explanation, highlighted by both Spriggs and Atlanta Fed President Raphael Bostic, is that many people simply aren't very familiar with U.S. history and the legacy of the laws and systems that denied access to people of color. "If we don't know that history, then it's much easier for an economic modelist to assume, oh, it must be something about the minorities or the women who they have in their data set, and not something where they are a byproduct and really a victim of those earlier decisions," Bostic said.

The result of these paradigmatic blinders is that it can be difficult to convince economists that discrimination is real. "There appears to be no evidence to get economists to admit that yes, there's discrimination, and yes, it matters," Spriggs said.

A remedy, suggested Sendhil Mullainathan, Roman Family University professor of computation and behavioral science at the University of Chicago Booth School of Business, may be to set aside economics' traditional technical tools for a moment and spend time just talking with people. "I would love if everyone in the profession could have a heartfelt one-hour, two-hour conversation with someone who's been disadvantaged by the system that we see today. The barriers just aren't salient enough and the problems salient enough for most people," Mullainathan said. In its desire to be an empirical science, economics has lost touch with its fundamental human nature.

Promoting inclusivity and effecting change

The third panel, moderated by Marketplace host and correspondent Kimberly Adams, considered changes that would lead the way to creating a more diverse, inclusive, and informed discipline. No single step is enough, but panelists throughout the event identified specific actions they encouraged economists to take.

A first step, Wilcox suggested, may be quite simple: Advertise to high school students and undergraduates that economics is relevant to "the broadest spectrum of individual lives and experiences." Actively bringing that message to young people has the potential to broaden the backgrounds of

those who enter the profession and thus who will shape it five or 10 years down the road.

Changing the profession also requires speaking up. “Everyone has to be an active bystander who says, ‘That’s not OK’ when they see a person of color being dismissed or being berated or talked about poorly in a faculty meeting or a tenure decision meeting,” Lisa D. Cook, professor of economics and international relations at Michigan State University, urged.

Speaking up extends to offering support and encouragement to people of color as they move through the profession. Catalina Amuedo-Dorantes, professor of economics at the University of California, Merced, described how she personally has at times felt like an outsider because she is not a White man. “I felt that I wasn’t as informed as some of my other colleagues, that I didn’t know a lot of the options, a lot of the possibilities that were out there,” Amuedo-Dorantes said. Mentoring can start to close those information gaps.

While there is much that economics can and should learn from other disciplines about increasing diversity and studying race, some of the solutions will come from within, advised Arthur Lupia, assistant director at the National Science Foundation and Gerald R. Ford distinguished university professor of political science at the University of Michigan. “Economists study how people actually behave, what their incentives are. That’s an amazing tool.”

Why diversity, equity, and inclusion in economics matter to the Fed
Ultimately, achieving diversity may itself be part of a solution to some of the problems that economics is now experiencing, by bringing into focus a broader set of issues and by empowering people who will be agents of change. Bostic, Rosengren, and Cleveland Fed President Loretta Mester emphasized greater intentionality in efforts to achieve diversity across the Federal Reserve System, from recruitment of research assistants to the constituencies consulted for the Beige Book to leadership on the Banks’ boards of directors.

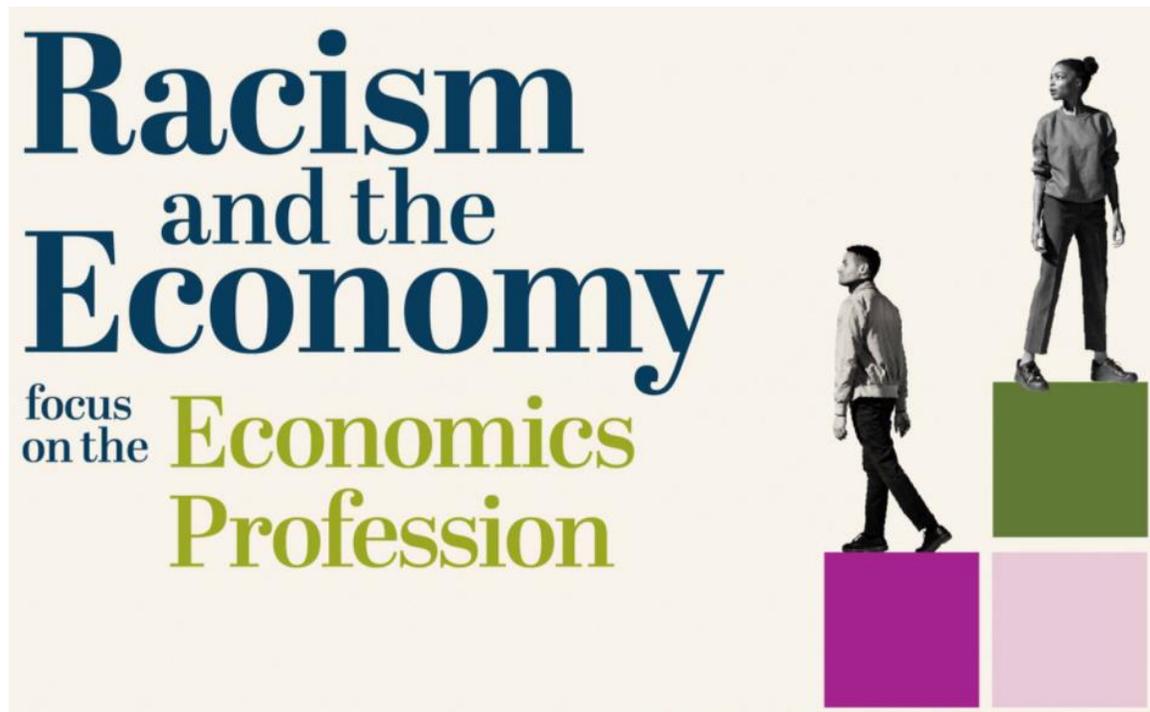
“Different people will have different experiences, they’ll have different viewpoints and perspectives, and we want to be able to harness all that difference in viewpoints for the good of our policymaking in the Fed and also for the good of our organizations,” Mester said.

The appetite for change is here. Nearly a quarter of the event’s registrants—more than 1,000 people—pledged to promote awareness and discussion of the event in their workplaces. This pledge aims to create momentum for candid dialogue and meaningful change around racism in

economics. To help facilitate these discussions and learn more about how racism affects the people and practice of economics, visit the Discussion Guide and the list of Additional Resources. A link to the video of the full event and biographies of all speakers is available on the event's webpage at: <https://www.minneapolisfed.org/events/2021/racism-and-the-economy-focus-on-the-economics-profession>

You may visit:

<https://www.bostonfed.org/news-and-events/news/2021/04/racism-and-the-economy-series-examines-racism-impact-on-the-economics-profession.aspx>



Number 8

Masks Under the Microscope

Viewed under a microscope, mask fabrics are complex, varied and beautiful.



To understand how something works, it helps to see it up close.

A team of researchers took this approach when studying the fabric masks that people wear to slow the spread of COVID-19.

Those masks work by blocking some of the virus-filled droplets and smaller particles, called aerosols, that an infected person exhales, and they also offer some protection to the wearer by filtering incoming air.

The researchers wanted to know how well different fabrics filter out those particles and what makes some fabrics better filters than others.

Their research indicates that that cotton fabrics tend to perform better than synthetics, with cotton flannels being particularly effective.

After being exposed to the moisture in a person's breath, cotton fabrics perform better still.

As part of this research, one team member, Edward Vicenzi, used a scanning electron microscope to examine the fabrics up close.

Vicenzi works at the Smithsonian's Museum Conservation Institute, where he studies the history and origin of objects in the museums' collection.

He is also a visiting researcher at NIST. His images gave the scientists important insights into the particle-filtering properties of different fabrics. And they can give us all a sense of the beautiful, textured, woven world right in front of our faces.

Polyester is a synthetic material that, like many fabrics, is made up of individual fibers bundled into yarns then woven together. The image shows the cross-sectional shapes of the individual fibers. The researchers used images such as this one to measure the width of the individual fibers — a key variable that affects particle filtration.

The entire scale bar in this image is 125 micrometers, or millionths of a meter, wide — a bit wider than an average human hair.

Aerosols that might contain the coronavirus vary in size, but smaller ones might be one-hundredth the width of the fibers in this image, and some are even smaller. Fabric masks do not capture all of these small aerosols, but they capture many of them, which slows the spread of the disease.

To read more:

<https://www.nist.gov/feature-stories/masks-under-microscope>



Number 9

Heating up High Performance Computing with Low Temperature Integrated Circuits

Program aims to develop very low temperature device technology to overcome power efficiency limitations in high-performance computing



High performance computing (HPC) is a critical enabler of defense applications – from processing data at the tactical edge to powering weather prediction systems.

Historically, the advancement of HPC has been driven by new generations of integrated circuit (IC) technologies and continuous improvements in transistor density, performance, and energy efficiency.

However, Moore’s Law – the guiding principle behind conventional transistor scaling – is slowing due to a host of technical challenges, including operating voltage reduction, making it difficult to continue with this paradigm.

The limitations of conventional computing technologies make it exceedingly difficult to keep pace with the demands for faster and more dense computational power in an energy efficient way.

“Today, we’re aggressively reaching the end of Moore’s Law scaling and are faced with the inability to scale power density much further in order to improve computing performance,” said Jason Woo, a program manager in DARPA’s Microsystems Technology Office (MTO).

“A viable solution is cold computing. While microelectronics is typically designed to operate at room temperature, we know that device characteristics improve significantly at reduced temperatures. Very low temperature devices – those operating at 77K or below – have the potential to overcome the power scaling limit, but challenges exist when you apply them to very large scale integration.”

To overcome the barriers to thermal and power density scaling in HPC systems, DARPA developed the Low Temperature Logic Technology (LTLT) program. LTLT seeks to enable a dramatic improvement in performance over power when operating electronics at temperatures close to that of liquid nitrogen (~77K or -321F).

The goal of LTLT is to develop high-performance, low-temperature 14nm node or below complementary metal-oxide-semiconductor (CMOS) FinFETs by making modifications to advanced very large scaled integration (VLSI) processes.

The resulting device/circuit technology should be capable of achieving a 25X improvement in performance/power compared to state-of-the-art (SOA) central processing units (CPUs) operating at room temperature. LTLT also seeks to develop and demonstrate a compact static random-access memory (SRAM) cell that can operate at 77K to complete the basic circuit elements needed for HPC engines.

To achieve the program's objectives, LTLT aims to exploit the unique device/material characteristics and performance of today's advanced nodes FinFETs operating at very low temperatures to develop transistors and memory cells with superior performance/power than is realizable by simply cooling current SOA VLSI technologies.

The program is broken out into two separate research areas.

The first will focus on researching, developing, and delivering a fabrication technology for highly integrated, advanced node CMOS operating at 77K, with low supply voltage and high performance.

The target technology will be able to integrate low temperature transistors, SRAM cells with 25X lower switching energy at 77K, and a supporting circuit/system design.

The second area in the program will explore advanced research concepts focused on high-risk/high payoff FinFET VLSI-compatible solutions for individual technical challenges at 77K.

Three specific challenges will be explored, which include ultra-low power, high-speed scaled transistors with new switching or transport mechanisms; compact, high speed, low energy SRAM cells; and new circuit techniques that utilize novel LTLT transistors and memory cells to achieve a 45X performance/power improvement.

The LTLT program will also utilize the benefits of DARPA's recently unveiled Toolbox Initiative.

The DARPA Toolbox provides open licensing opportunities with commercial technology vendors to the researchers behind the Agency's programs.

Through this initiative, DARPA researchers – or performers – are provided easy, low-cost, scalable access to state-of-the-art tools and intellectual property (IP) under predictable legal terms and streamlined acquisition procedures.

Additional information about the Toolbox and the commercial suppliers participating in this initiative can be found here, <https://www.darpa.mil/work-with-us/darpa-toolbox-initiative>

Interested proposers have until May 18, 2021 to submit their proposals. Additional information on LTLT's goals and objectives can be found in the Broad Agency Announcement, https://beta.sam.gov/opp/110fc53cc3274eb4a7af78299ad2186c/view?keywords=LTLT&sort=-relevance&index=&is_active=true&page=1



Number 10

Russian Foreign Intelligence Service Exploiting Five Publicly Known Vulnerabilities to Compromise U.S. and Allied Networks



The National Security Agency (NSA), the Cybersecurity and Infrastructure Security Agency (CISA), and the Federal Bureau of Investigation (FBI) jointly released a Cybersecurity Advisory, “Russian SVR Targets U.S. and Allied Networks,” to expose ongoing Russian Foreign Intelligence Service (SVR) exploitation of five publicly known vulnerabilities.

This advisory is being released alongside the U.S. Government’s formal attribution of the SolarWinds supply chain compromise and related cyber espionage campaign.

We are publishing this product to highlight additional tactics, techniques, and procedures being used by SVR so that network defenders can take action to mitigate against them.

Mitigation against these vulnerabilities is critically important as U.S. and allied networks are constantly scanned, targeted, and exploited by Russian state-sponsored cyber actors.

In addition to compromising the SolarWinds Orion software supply chain, recent SVR activities include targeting COVID-19 research facilities via WellMess malware and targeting networks through the VMware vulnerability disclosed by NSA.

This was highlighted in NSA’s Cybersecurity Advisory, “Russian State-Sponsored Actors Exploiting Vulnerability in Workspace ONE Access Using Compromised Credentials.”

NSA, CISA, and FBI strongly encourage all cybersecurity stakeholders to check their networks for indicators of compromise related to all five vulnerabilities and the techniques detailed in the advisory and to urgently implement associated mitigations. NSA, CISA, and FBI also recognize all partners in the private and public sectors for comprehensive and collaborative efforts to respond to recent Russian activity in cyberspace.

NSA encourages its customers to mitigate against the following publicly known vulnerabilities:

- CVE-2018-13379 Fortinet FortiGate VPN
- CVE-2019-9670 Synacor Zimbra Collaboration Suite
- CVE-2019-11510 Pulse Secure Pulse Connect Secure VPN
- CVE-2019-19781 Citrix Application Delivery Controller and Gateway
- CVE-2020-4006 VMware Workspace ONE Access

Five Vulnerabilities SVR is Exploiting Right Now and How to Stop Them

UNDERSTAND THE THREAT

The Russian Foreign Intelligence Service, known as SVR, poses a significant risk to U.S. and allied government networks. In addition to having compromised SolarWinds Orion software updates recently, SVR cyber actors are exploiting at least five publicly known vulnerabilities to gain footholds into victim networks. Network defenders should take action to mitigate compromises and prevent future loss of sensitive information.

Publicly known vulnerabilities SVR is exploiting:

CVE-2018-13379

CVE-2019-9670

CVE-2019-11510

CVE-2019-19781

CVE-2020-4006

TAKE ACTION



Update systems and products as soon as possible after patches are released.



Assume a breach will happen; review accounts and leverage the latest eviction guidance available.



Disable external management capabilities and set up an out-of-band management network.



Block obsolete or unused protocols at the network edge and disable them in client device configurations.



Reduce exposure of the local network by separating internet-facing services into a small, isolated network.



Enable robust logging of internet-facing services and authentication functions. Continuously hunt for signs of compromise or credential misuse, particularly in cloud environments.



Adopt a mindset that compromise happens: Prepare for incident response activities.

For more information, review the advisory at:

https://media.defense.gov/2021/Apr/15/2002621240/-1/-1/0/CSA_SVR_TARGETS_US_ALLIES_UOO13234021.PDF/CSA_SVR_TARGETS_US_ALLIES_UOO13234021.PDF

or visit:

<https://www.nsa.gov/What-We-Do/Cybersecurity/Advisories-Technical-Guidance/>



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- Prior experience with vendor risk management preferred.
- Experience working with 3rd party vendors is preferred.

Companies and organizations around the world consider the Certified Risk and Compliance Management Professional (CRCMP) program a preferred certificate. There are CRCMPs in 32 countries. You can find more about the demand for CRCMPs at:

https://www.risk-compliance-association.com/CRCMP_Jobs_Careers.pdf

For the Certified Risk and Compliance Management Professional (CRCMP) distance learning and online certification program, you may visit:

https://www.risk-compliance-association.com/Distance_Learning_and_Certification.htm

For the Certified Information Systems Risk and Compliance Professional (CISRCP) distance learning and online certification program, you may visit:

https://www.risk-compliance-association.com/CISRCP_Distance_Learning_and_Certification.htm

For the Certified Cyber (Governance Risk and Compliance) Professional - CC(GRC)P distance learning and online certification program, you may visit:

https://www.risk-compliance-association.com/CC_GRC_P_Distance_Learning_and_Certification.htm

For the Certified Risk and Compliance Management Professional in Insurance and Reinsurance - CRCMP(Re)I distance learning and online certification program, you may visit:

https://www.risk-compliance-association.com/CRCMP_Re_I.htm

For *instructor-led* training, you may contact us. We can tailor all programs to meet specific requirements.