Yale SCHOOL OF MANAGEMENT
Program on Financial Stability

Lessons Learned Oral History Project Interview

Interviewee Name **Crisis Position**	Daleep Singh[1] Head of the Markets Group, Federal Reserve Bank of New York
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Introduction

Daleep Singh served as head of the Markets Group at the Federal Reserve Bank of New York from February 2020 to February 2021. He was in this leading role helping to formulate and effect the Fed's response to the COVID-19 crisis. He met with the Yale Program on Financial Stability (YPFS) to share insights related to the Fed's crisis responses during the pandemic.

This transcript of a Zoom interview has been edited for accuracy and clarity.[2]

Transcript

YPFS: **Thanks again for joining us. We're going to focus in on your time with the New York Fed, but just by way of background, if you could give us the broad arc of your career up through now.**

Singh: Sure. So, after grad school, I spent the first eight or so years of my career on a trading floor, almost entirely at Goldman Sachs. In the beginning, I was focused on US interest rates. And towards the back half of my time on the trading floor, I was trading emerging market securities, primarily emerging market bonds and currencies. I then joined Treasury in 2011 to help build the Markets Room—the eyes and ears of Treasury into financial markets. After a couple years in that role, I moved over to policymaking and became the Deputy Assistant Secretary for Europe and Eurasia, which involved a series of crisis management exercises with sovereign debt in Europe, the invasion of Ukraine, and then Greece's near exit from the euro area.

Later, I transitioned over to the domestic finance part of Treasury to serve as Acting Assistant Secretary for Financial Markets. During that time, the main challenges were the debt crisis in Puerto Rico and a succession of debt ceiling

[1] The opinions expressed during this interview are those of Mr. Singh, and not those any of the institutions for which the interview subject is affiliated.
[2] A stylized summary of the key observations and insights gleaned from this interview with Mr. Singh is available in the Yale Program on Financial Stability's *Journal of Financial Crises*.

impasses that required active involvement from our debt management office. After the election of 2016, I left government to rejoin the private sector. I was working at a Brazilian asset manager for a couple years until the New York Fed offered the role of Markets Group Head just before COVID hit. I served in that role until I joined the [President Biden] administration soon after it was inaugurated in 2021. And there, I was serving as the Deputy National Security Advisor for International Economics until very recently.

YPFS: **So just quickly going back to setting up the Markets Room at Treasury, how crisis focused was that at the time?**

Singh: Yeah, the word I got before I joined was that Treasury Secretary Geithner was looking for someone from the front lines of financial markets to translate the message of what markets were conveying about the policy choices being made by the Treasury and how markets might react to policy choices under consideration.

During that time, from 2011 until 2013, the global economic environment was still fragile. The US recovery was still not yet entrenched, and it certainly wasn't yet evident in the labor market even though we had emerged from economic contraction. And the sovereign debt crises were raging in Europe; even Italy was starting to succumb to concerns about debt sustainability. Spain, Portugal, and certainly Greece were in distress as well, to varying degrees. Then, in 2013, we had to contend with a Fed-induced "taper tantrum" that spilled over to most of the emerging economies, and then back to the US.

When I left as Director of the Markets Room to run the Europe deputate, Greece once again came under acute and intense pressure, culminating in 2015 when they were on the cusp of exit after the election of the Syriza government. Almost concurrently, Russia invaded Crimea and threatened to take over large swathes of Ukraine. Much of my effort at that moment was to help design and develop the first sanctions effort against an economy as large, complex, and connected as Russia's. So, Greece and Russia/Ukraine were the preoccupying crises during my time in the Europe office.

YPFS: **Okay, sure. And then fast forwarding to the New York Fed as Head of the Markets Group in 2020. So, you joined in February 2020. From our understanding, the COVID-19 pandemic preparations are already underway. At least in the building, they're thinking about this virus that is a foreign virus at this point, for the most part. What do you remember from those first days? What was the thinking like? How fast did things happen, etc.?**

Singh: I remember those days very well. I had just joined the Fed from an emerging market hedge fund, and I came into the job already nervous about the global backdrop. I remember China had returned from Lunar New Year in early

February, and I think the first day that Chinese markets re-opened, the Shanghai Composite crashed almost 10%. I recall during my first day on the job at the New York Fed, I was getting emails from market contacts saying, "Congrats on the role, and here are pictures of empty streets in Shanghai." Almost all of the contemporaneous activity data from Asia during February were showing a multiple-standard-deviation collapse in the economy, and I don't use that word lightly.

By contrast, as late as mid-February, economic data in the US were still looking solid. The S&P was within a percent or two of the all-time high. What began to tell the story that would soon unfold was the safe-haven bid in the dollar, as well as the downdraft in oil markets.

You could then start to see concentric circles from the fragility in currency markets to credit markets and then equities. I started to get dispatches from CEO contacts who were operating in China. I remember those conversations very well—if memory serves, Adidas sales in China were down 85% year-over-year in February, and not a single Jaguar was sold during the month. These stories caught my attention. And then we saw that sea freight traffic in London was nearing all-time lows. Within a week, by February 24, the bond market in the US started to crack. The fed funds target rate was the highest point on the yield curve all the way out to 30-year maturities. So, the yield curve inverted as far as investors could see, which is a telltale sign the markets are getting nervous.

In a sense, markets were telling the Fed, "It's time for you to move." And we had to move quickly, because there were visible liquidity stresses building in US credit markets. And in the same week, the VIX "fear index" in the equity market exploded after a senior Fed official said monetary policy was in a good place. I began to receive more panicked dispatches from market contacts saying, "The Fed is disconnected from reality," and, "Don't wait for the economic data to corroborate what we're hearing and seeing on the ground." Beyond all the observable market signals, and the growing left tail of the probability distribution, we were facing Knightian uncertainty—the "unknown unknowns" of how the shock would propagate to the real economy. Markets weren't waiting for clarity to emerge; almost anyone who managed risk according to a VaR model was cutting position at the same time and in large size.

So, it's really at the end of February that I started to get quite serious about our operational readiness on the alphabet soup of facilities we had launched in 2008. I decided to call Treasury, and I remember I remember calling Justin Muzinich, who was the Deputy Secretary, and asking whether he was familiar with TALF.

At that point, TALF seemed like the most directly relevant facility for the COVID shock because it could directly support the real economy. In ’08 it was different; the shock was concentrated in the financial sector. This time, the proximate risk was in the nonfinancial sectors of the economy, especially small businesses, and TALF seemed like the best facility to backstop that part of the real economy—particularly if we had a first-loss contribution from Treasury. At the same time, of course, we directed our teams to think about how to reboot the PDCF, the CPFF, and other liquidity facilities that seemed appropriate, including the TSLF. "Should we have a TSLF? Should we have a TAF?" All of those questions were asked around late February.

YPFS: **Okay. There's a lot there that I want to unpack. Let's start just with getting market color. So, you have an extensive background of contacts at this point. The New York Fed obviously has a whole operation like this too. We hear about how in 2008, the Fed was just sort of flooded with requests of, "Give me a bailout. Give me a bail..." You can pick your word; I don't mean to use a charged word like “bailout.” But what was that process like? How much of that is formal versus informal? How much of that is you're hearing from the primary dealers versus folks that the Fed's not necessarily interacting with? What's that process like?**

Singh: Oh, it's all of the above. But you're right. It wasn't as though we were getting requests for a parachute, but it was full-scale panic by the first week of March. It was mostly informal feedback. We were of course getting feedback from primary dealers, but many of us had contacts outside of primary dealers with whom we’ve interacted for decades. That's a very useful network because it gives you a baseline. They're a group of contacts I've been in touch with for almost 20 years—in pension funds, insurance companies, asset managers, endowments, in banks, hedge funds, and overseas institutions. When they're all saying the same thing at the same time and it deviates from what they typically report, you take it seriously.

In addition to informal feedback, my method every morning since I started in markets in '03, was that before I talk to anybody, before I read a single word of a story—from the financial press or the mainstream media—I look at numbers. I’ve had the same numbers and market indicators on my Bloomberg screens for 20 years, and it gives me an unvarnished sense of how the world changed overnight, where, to what extent.

I can then form my own hypotheses as to why those numbers are moving, which I then test with what I read. That's what I did throughout the crisis. But by the time I woke up, I had a lot of texts and incoming calls I could use to test hypotheses very quickly. Those hypotheses would evolve several times each day. I was living in a corporate apartment half a block from the New York Fed, since I had yet to find a place to live, so I was [at the New York Fed] pretty much around the clock, along with [FRBNY President] John [Williams], [Executive Vice President in the Markets Group] Lorie [Logan], and others. We were all there, sharing what we'd seen and heard in real time and trying to piece it together with colleagues from the Board [of Governors of the Fed], and ultimately reporting up to the "troika" of Fed leadership. I remember Chair Powell had just come back from Saudi Arabia at the G20, and it's now well-documented that he was shaken by what he heard at that meeting.

YPFS: **The "troika" being Williams, Fed Vice Chair Richard Clarida, and Powell, correct?**

Singh: Yes. And [Fed Governor] Lael Brainard would take part in those discussions, too.

YPFS: **Okay, very nice. So, before the 13(3) facilities, the Fed obviously eases monetary policy, it does some things around QE, it takes the discount window premium down to zero.**

Talk a little bit about the discount window. So, there's a few things that happen with the discount window. One, you mentioned there was some thinking around the Term Auction Facility—the destigmatizing, discount window auction facility used in 2008. This wasn't used in 2020, but there were some other things to do with stigma.

For one, the banks sort of went out and promoted it a little better than last time. The 2007 story was, "Hey, we're going to borrow, but we really, really, really don't need it." And this was more like, "Hey, we're going to borrow because it's a useful thing to have."

And then there was the change in the way the Fed disclosed the discount window loans by region. So, this has long been thought of as a way that the markets could parse out who's borrowing from the discount window— If there's a big borrowing at, say, the San Francisco Fed, maybe it was Wells Fargo. But the Fed changed the way discount window lending was disclosed. So, what was the thinking around the discount window then? Clearly, there was some concern about stigma, but no Term Auction Facility. So, what was that process like?

Singh: Yeah, I think you described it really well. The goal was to eliminate stigma from the discount window, and the only way to do so was to have the biggest banks use the facility at once and to provide transparency to taxpayers in doing so. We also wanted to make sure that institutions didn't feel as though they were being singled out in any way, and that influenced the way in which the numbers appeared on the H.4.1 release. It was important when JP Morgan went out first in their Investor Day in February and said, "Look, we're going to use this facility and we expect the other largest institutions in the US to do the same." And then eight of the banks did so at once if I recall.

The number I have in my head, is that we had about $3 billion in discount window usage, in February. Then it spiked to $100 billion in March. And so that's why we didn't need the TAF; we had enough discount window usage to feel comfortable about the aggregate amount of liquidity available to our counterparties. So, in essence, it worked for depository institutions, and we felt that if we announce the CPFF, the PDCF, and other tools that would help unclog market plumbing issues for non-banks, we could forestall a worsening liquidity event.

YPFS: **Sure. And so around the same time, the Fed has the standing swap lines leftover from 2008 and then it expands to a larger group of emerging markets within a few days of these other announcements. So, what was that like? What were you seeing there? What were you hearing? How quickly was that sort of unrolled?**

Singh: So, what we wanted to do was to backstop both the domestic funding markets and the offshore dollar funding markets at the same time. As you know, there is a global market with demand for dollar liquidity. That's especially true during times of stress, since there are at least $10 trillion in dollar liabilities held offshore—and the reality is we don't have visibility into what share of those $10 trillion in offshore liabilities are short-term maturities or longer term. And we knew that, really, the largest demand for dollar liquidity could very well be offshore institutions that have dollar liabilities and need to refinance at relatively frequent maturities. And so, we could see from the cross-currency basis—which is the cost of borrowing dollars in exchange for other currencies held as collateral—that wholesale dollar funding markets were seizing up, as much as 6 or 7 percentage points above normal. And so, we really needed to find a way for offshore borrowers to post high-quality collateral in exchange for cash. We knew that many large foreign official players had large stocks of Treasury holdings, and we didn't want them to sell those Treasuries outright to raise cash—along the lines that we saw taking place in the second and third weeks of March, to the tune of $100-$150 billion. We needed to have a facility in which they could gain access to cash without liquidating Treasury securities.

Hence the FIMA Repo Facility. It gave 30 or so central banks the ability to borrow cash against their holdings of Treasuries, which accounted for about 75 percent of total holdings among foreign official institutions. We also expanded, as you said, the swap lines to 14 central bank counterparties. We made sure the pricing of these facilities was set at a backstop rate, such that they would self-liquidate when market conditions normalized, and also to ensure that we weren't creating adverse pricing for domestic actors relative to international institutions. We wanted to ensure a level playing field. Lastly, we wanted to align the timing of the announcements of onshore and offshore liquidity facilities, but I can't recall the exact dates.

YPFS: **So, the additional central bank foreign exchange swaps announcement was on the 19th, but the FIMA came on the 31st; FIMA came at the end of the month.**

Singh: Yeah, yeah.

YPFS: **The swap saga was sort of a saga in the GFC too because there's obviously sort of a foreign policy component to swap lines—and certainly tons of economic components as well. So, in thinking about setting up the FIMA: The FIMA's a backstop to the Treasury market, but it's also—in a sense—a backstop to swaps, right? It's sort of a stopgap with countries that you don't want to have a swap line with. The big one that was looked at with FIMA is China because they have a ton of Treasuries, and they didn't have a swap line. That was the 800-pound gorilla. Could you speak to that thinking and what you guys were seeing and why... You make a conscious decision to not give countries a swap line, but then you put the FIMA in as a backstop.**

Singh: Well, we knew that if you look at the largest official holders of Treasuries and the percentage of those holders that had access to the swap lines, it was a small fraction since the coverage didn't include China. And there were other countries with large Treasury holdings, too, that just weren't able to access swap lines for a variety of reasons. The FIMA Repo Facility gave us a chance to expand the list of counterparties, but I don't think we disclosed the specific country names.

YPFS: **Correct.**

Singh: If those countries wanted to, they could have announced their participation, but we didn't announce it for fear of creating a stigma effect. Including swap lines and the FIMA Repo Facility, I believe we ended up offering dollar liquidity to that "covered" well over 80% of the foreign official holdings of Treasuries. And that was important, because during the middle two weeks of March, we had just seen an historic amount of liquidation of Treasuries from every kind of account: domestic, foreign, private, official. I think foreign central banks sold about $150 billion of Treasuries in March alone, which was the highest on record. Not all of those dollar sales were used to defend the value of their currencies; a lot of it was just essentially cash under the mattress. Again, we wanted to have a way for foreign central banks—and their own counterparties to whom they provided dollar liquidity—to raise cash without selling Treasuries. Of course, we could counteract those Treasury sales with asset purchases, but we'd already committed to trillions of dollars of asset purchases by that point. We didn't want to make that number even higher.

YPFS: **So, you mentioned earlier, 30 counterparties?**

Singh: For the FIMA Repo Facility, yes.

YPFS: **So, you said about 80% of the Treasury foreign holders were covered in that sense. So, there's a specific list. It wasn't like, "If you think you qualify, come talk to us." It was: You alerted the 30 counterparties.**

Singh: We went out to 30 counterparties and basically explained to them the modalities of the facility and that we welcomed their participation. It was up to those counterparties as to whether they'd apply, and I think almost all of them did so.

YPFS: **And so, there's a broader existing list of international institutions and central banks that the New York Fed offers a suite of services, and that includes more than 30 "customers," effectively.[3]**

Singh: Yes, international monetary authorities such as the BIS were also eligible.

YPFS: **Sure. Okay. So, let's move on to 13(3) then. You spoke to this a little bit. The FRBNY is obviously critical on the market color and in implementing the facilities. We did have two facilities that got run out of Boston, but obviously all the approvals come from the Fed Board. Can you talk a little bit about what the FRBNY's interaction was with the Board when it came to rolling out those facilities, as well as where the Boston Fed came into the picture as well?**

Singh: Yeah, sure. Our comparative advantage in New York was to diagnose the clogs in market plumbing that were evolving at breathtaking speed. Based on that diagnosis, which was unfolding in real time, and the fact that our job was to be the eyes and ears of the Fed into financial markets, those of us in New York played an important role in the design of the emergency facilities. We collaborated intensely and every day with Board colleagues—especially [Division of Financial Stability Director] Andreas Lehnert and Lael Brainard—just to think about the pricing of the facilities, the eligibility terms, the size of the facilities, the capital structure of the SPVs, how much equity we would need under various scenarios, and the modalities of execution.

Particularly for the facilities in which we were the aggressor... Like the SMCCF for example: Assess the degree of market dysfunction, think about how many corporate bonds we should buy to address the dysfunction, when to buy, at what credit rating, and in which sectors. Those are the kinds of conversations

[3] Per the New York Fed: "The New York Fed provides services to foreign official and international institutions that facilitate the execution of public-sector mandates such as foreign reserves management, international relief and assistance, and financial stability. There are over 200 account holders maintaining more than 550 deposit and custody accounts at the New York Fed. Foreign central banks and monetary authorities hold the vast majority of these accounts, with international and regional organizations, foreign governments, and specialized accounts comprising the remainder." Via: https://www.newyorkfed.org/markets/central-bank-and-international-account-services.

we were having all the time with the Board. And you're right: Ultimately, they make the final call, but we collaborated on a lot of the "R&D," if you like.

Boston was performing a similar function for the two facilities in which they had ownership, the MMLF and Main Street. Those facilities launched a little bit after our facilities did in New York. Our Boston colleagues were often on the same calls. We communicated and collaborated, but not so much in the beginning. The Main Street facility was kind of its own animal and followed a different track in many ways. MMLF was very similar to the CPFF, the PDCF, and the other liquidity facilities.

So, we had the seven... PDCF, CPFF, PMCCF, SMCCF, MLF, TALF, and PPPLF were the facilities we managed in New York.[4] Boston had its two. I think when we started thinking about workout strategies, that's when we had more collaboration with Boston. For the Main Street facility, the CCFs, and, to a much lesser extent, the MLF, we had to consider whether there were synergies and economies of scale in terms of vendors we could choose and our philosophy of what to do with distressed or defaulted exposures.

YPFS: **Okay. And what was the staffing challenge or lack of challenge like when you're standing up all those facilities at once? Are you pulling people in from Research? Are you hiring people? What's that like?**

Singh: It was a massive challenge. Yeah. For each of the facilities we stood up, the first step was: Work with the Board to draft a one- or two-page term sheet, and agree on every word in that term sheet with Treasury. Once we knew the economic goals of and operational challenges for the facility, the next step was to consider the skills we needed to operate the facility. So, we'd go through that exercise of identifying the skillsets, and then we had to consider the amount of bandwidth we'd need at varying degrees of stress in the market. Relatedly, we had to consider the tradeoffs involved in pulling people from their existing roles to work on the special facilities.

Part of the difficulty in making these assessments was the uncertainty of how much activity and volume each of these facilities might need to facilitate. When we identified gaps in skills or we just didn't have enough manpower, we considered the extent to which we should use outside vendors to help execute. But here, the question was, "What kind of activities are we comfortable outsourcing to vendors? What sort of relationship would we want? Are there enough vendors out there that could allow for a diverse selection that we could manage in a coherent and principled way?" Those are the kinds of questions we asked. And yes, we pulled from everywhere. Throughout the process, we had a philosophical preference to not just pull the same people who were

[4] In response to an emailed follow-up question, Singh clarified that the FRBNY did not have "ownership" of the PPPLF. But rather, because the vast majority of PPPLF lending was done through FRBNY, it had de facto primary responsibility.

involved in the '08, '09 facility execution, but also to train and breed a new generation of emergency facility firefighters.

From my position in the Markets Group, I can say we had a tremendous amount of help from colleagues in the New York Fed in terms of thinking through all of the compliance-related processes that we would want to put in place. Trading restrictions, for example, guardrails on information flow, all of the infrastructure, like technology and data. The reporting channels to our board of directors at the New York Fed, to Congress, to the Inspector General… all of those were reporting lines and processes we had to create and execute in a timely way, and it was only possible with colleagues from the New York Fed and across the Federal Reserve System.

YPFS: **And so just with respect to pulling vendors, one thing that was I guess somewhat notable in real time was that even after the facilities had sort of calmed—they were basically in runoff—the Fed was still onboarding new vendors and new counterparties to these facilities. So that speaks to almost sort of filling out the structure of how something could be implemented in the future. So, what was the process like of internally retaining the insights and the structure? Because obviously, you can't stay crisis-level staffed through the cycle. So, what was that like—making these things permanent, making it so that you can respond quickly in the future? I'm sure there was some thought around using the same counterparties. Obviously, the relationship with BlackRock got a lot of scrutiny. So how were you guys thinking about that?**

Singh: Number one, we wanted to make sure that we had a process to diversify the range of vendors that we used to support the facilities. And that meant a really concerted effort to give opportunities to minority-owned and women-owned vendors to the program. And we reached out to associations like NASP, which is the National Association of Securities Professionals, to explain the nature of all the facilities and invite them to submit proposals to compete for participation as vendors.

But aside from the vendors, we were doing all we could throughout the process to institutionalize how the facilities reside within the Fed's structure by documenting all of the processes that we established on governance, transparency, and accountability. We also designed a rotation of personnel off the facilities so that we could train new people to come on board. That created redundancy in terms of people who could execute as the first wave needed time to recharge. We weren't trying to create a small group of crisis-fighting heroes who had all the information about what to do in their head. We tried to document and spread the knowledge as much as possible, both to the New York Fed as a whole and the Federal Reserve System more broadly by pulling personnel from other Reserve Banks. We spent a lot of time cross-training each other, and we tried to have people rotate from one facility to another so that almost everybody knew how to contribute on any of the facilities at any particular time.

We also invited audits, both internal and external, just to make sure we were following best practices. Our board of directors in New York was extremely helpful in helping us think about how we could establish guiding principles—even in the middle of a crisis—around transparency, governance, and accountability. If any of us were called to testify before Congress, we could say, "These were the principles that guided the way in which we set up our processes and our information flows and the manner in which we deployed taxpayer resources executed." It was deliberate and thoughtful—no one was putting their finger to the wind.

YPFS: **Then there was also some controversy towards the end of 2020, we'll call it tension with Treasury and then ultimately with Congress over the facilities. And then, as part of legislation—the Consolidated Appropriations Act—Congress basically says to Treasury, "You cannot use the ESF the way you used the ESF to support facilities that are 'the same as' these CARES Act facilities, except for the TALF." How much is the New York Fed or the Fed broadly thinking about what their interpretation is? Was there much war-gaming of how you would change the facilities in the future to be consistent with the law if you wanted to support those markets? Or what was that like?**

Singh: It was just disappointing really, because at that moment, in late 2020, it didn't feel to me that we had emerged from the virus. I felt as though there were very limited costs to keeping the backstops in place, at least through the winter months, with the equity that had already been authorized instead of just the equity that had been committed. I think the equity that had been committed was around $25 billion, but the equity that had been authorized was closer to $200 billion, I think, out of the $495 billion that was legislated. And that's what was keeping markets functioning as well as they were by that point. To my mind, we were taking an unnecessary and premature gamble by changing the amount of equity backing the 13(3) facilities. You're asking whether we could still operate the facilities without the equity that we had previously?

YPFS: **Well, more: How much thinking was going on in the Fed about the way these interventions would have to be tweaked in the future. If you wanted to do something like the corporate bond facility, how much were you thinking about the language and...**

Singh: You're saying, Steven, to what extent could we have an SMCCF or a PMMCF without equity backing? How could we—

YPFS: **Well, no, the direction is clear there that the risk management would have to be tighter without equity... More just thinking: Was the specific**

language of Congress... Because they didn't say, "Oh, you can't have equity backing." They didn't say, "You can't do a facility like this." They said, "Specifically, Treasury, you can't put ESF money in something that is the same as the SMCFF, the MLF…" So, was there thinking of how you can still go forward with the process of institutionalizing whatever positives came out of these facilities?

Singh: Well per Secretary Mnuchin, all five of the CARES Act facilities were set to lose their lending authority at year end 2020—the two CCFs, Main Street, the muni facility, and TALF. The remaining four, which were more focused on liquidity provision rather than credit—PDCF, CPFF, PPPLF, and MMLF—would continue to have lending authority through end-March 2021.

Losing lending authority doesn't mean they lost their equity. Secretary Mnuchin agreed to leave equity for the CARES Act facilities in an amount equal to the outstanding loan balances at year-end, i.e., every dollar of loans would get backed by a dollar of equity.

If Secretary Yellen wanted to reactivate the lending authority of the facilities, she could do so, but they would have had an aggregate equity position of $25 billion instead of $195 billion. $14 billion from SMCCF, $5 billion from MSLP, $4 billion from TALF, and $2 billion from MLF.

So, the potency of the backstops, from a signaling perspective, wouldn't be nearly what it was previously without another equity injection. For additional context, most of these facilities were leveraged anywhere from 3-to-1 for high-yield bond purchases to 15-to-1 in the case of the muni liquidity facility. On average it's about 10:1. The unencumbered portion of the ESF heading into year-end 2020 was about $60 to $70 billion.

YPFS: Before even the congressional tensions, what were some of the other things... I know Nick Timiraos [of the *Wall Street Journal*] reported that there was sort of ideas for a mutual fund facility. There was a lot of talk during early COVID about more support for mortgage-backed securities and mortgage-backed servicing. Did you guys feel like you had more facilities ready? Were there other ideas that you just didn't have to use? We mentioned the TAF. You alluded to the TSLF from 2008, which wasn't reused. I assume that's because there just wasn't the run into Treasuries in the same way. It wasn't a collateral crisis in the same way as 2008. You can add some color there if you wish. But what about some of these dogs that didn't bark? What were you guys thinking?

Singh: There was a long list of ideas that we were considering in the "R&D lab" in the event of more adverse stress.

For the MMLF, in extreme stress, we could consider scoping in A2/P2 rated paper, which would be a new and complex operation. Or it could be expanded to allow purchases of mutual fund assets either broadly, or specifically to purchase medium-maturity municipal bonds from tax-exempt, '40 Act mutual funds.

For the MLF, we considered ideas including: lower the cost, lower the facility fee, expand maturities. Or open an MLF for secondary market securities. For the PPPLF, we considered the idea of further expanding counterparties.

For the SMCCF, we could increase the pace of purchases—i.e., recalibrate the 'market functioning' score—with no term sheet change needed. We could also scope in longer maturities (beyond five years) and/or riskier assets (lower credits), but these required a term sheet change. For the PMCCF, we could lower the cost: the ratings-based spread, the cap, the facility fee. We also considered the development of sector-specific transaction terms depending on the issuers that request financing—say, REITs, not-for-profits. And again: lengthen maturities, lower credits.

On TALF, we considered whether to loosen collateral eligibility criteria. The introduction of certain asset classes—like the new-issue, conduit CMBS—could be achieved with only moderate impact on staff resources, while others like single-asset, single-borrower CMBS, certain subclasses of private-label RMBS, personal loan ABS, etc. would require a renegotiation of the term sheet. In acute stress, we could scope in asset classes with lesser histories like CRE CLOs or venturing below AAA-rated tranches.

YPFS: **Sure. And then I guess a semi-related question. On March 23rd, a lot of the facilities get rolled out; particularly by this point, the re-upping of the 2008 facilities has largely occurred, and some of them have equity from what was already existing in ESF. This is all pre-CARES Act. Then, April 9th is post-CARES Act. You get a further rollout; you get the MLF. The March 23rd announcement mentioned, "Hey, we're working on the Main Street facility." So that was again, even before CARES Act. And then there was sort of this question of which facilities get CARES Act ESF money and which facilities get "core" ESF money... And there's sort of an "all money is green" thing going on here. But at the same time, it ended up mattering, especially with the tensions in Congress. So, what was the conscious decision behind: the CPFF kept the core ESF money, the MMLF guarantee was core ESF money. And then these CARES Act facilities, the sort of real-economy, more credit-focused facilities got CARES Act money, and even the TALF eventually did. So, what was the thinking there about why?**

Singh: Yeah, as I recall, that was mostly the assessment about credit risk. And so, the distinction is the facility that didn't get ESF equity backing were-

YPFS: **Let me clarify, sorry. Some got ESF backing with ESF money, and some got ESF backing with CARES-Act-allocated ESF money. So, they're both**

getting the equity backing, and some of it is just under the purview of Treasury, and some of it is CARES Act Treasury money. It got replaced after the fact with new CARES money.

Singh: Yeah, I'm going fuzzy there. I used to remember this stuff.

YPFS: That makes sense. And I talked to other folks and there was sort of the answer of... We just wanted the money. The point was to get the equity and the split was maybe less important.

Singh: That's right. We wanted as big of an equity backstop as possible, so that we didn't have to use the equity. That was the idea. The bigger the bazooka, the less likely it is we'll get any usage, and we'll get more bang for the buck for the lending that does take place. During the worst of the crisis in March and April, we really didn't care where the money was coming from or under what terms.

YPFS: This was run out of Boston, but the MMLF was structured as a guarantee and not as an equity injection. Do you have any recollection of why that distinction existed? It was non-recourse loans to banks to buy the money market fund assets. And it had the $10 billion of credit protection from Treasury. But for whatever reason, it was just structured as a credit guarantee as opposed to an equity injection.

And I guess this kind of goes to the question of SPVs too, because we sort of get all these different comments about SPVs. And some of them, they have specific Treasury money, it's organized that way. There are some facilities that aren't run out of SPVs that have Treasury money, namely the MMLF. So, I don't know if you could speak to what the Fed's thinking is about why you use SPVs? Why do you use separate SPVs as opposed to one mega intervention SPV, where you can get that extra bang for your equity dollar from Treasury?

Singh: Oh, we would've preferred to have one big pool, one SPV in which we had discretion to allocate the equity backing where it was most needed. Treasury was very much opposed to that, and they wanted a clean, transparent way of knowing exactly what portion of their equity injections was being used to support which markets and to what extent, under what terms. They thought that was really important for Congress to know.

YPFS: Okay.

Singh: We didn't insist upon it. Yeah. Sorry—I'm remembering a little bit better. On the MMLF, I think we were okay with just guarantees because we thought it was just highly unlikely for the A1/P1 paper they were purchasing to be in default. And so, we didn't conceive of it the same way as some of the other facilities in which they were taking more risk. And in a way, the MMLF was dealing with a market that had already normalized once we announced that, I think, VRDNs [variable-rate demand notes] were going to be in scope. And so, we conceived the possible need for equity backing in MMLF, but we thought the first instance, let's try with guarantee and see if it works. And it did.

YPFS: **So, on the transparency point, whether it be for Congress or others, the SPVs were each externally audited. And the programs that weren't SPVs still had great transparency. I can still look now... Enough time has passed; I can look and see every transaction. So, what was the thinking behind these audits? Are these audits required? Why not audit every facility? Or why get these additional audits for an SPV? I don't know if you know much thinking around those.**

Singh: I don't know. I think we all were just trying to err on the side of subjecting ourselves to the highest level of scrutiny, knowing the experience of '08, '09. And so, there was almost no limit to the degree to which we were willing to subject any of the facilities to external scrutiny.

YPFS: **Okay, sure. So then, moving more into the sort of credit/real-economy facilities, you mentioned some collaborative thinking about workout issues. How were you guys thinking about potential workout? Obviously, it's different between corporate bonds and munis. So, I guess this is a two-part question. One is workout and two, you can correct me if I'm wrong here because I'm speculating at this point, but it seemed like you guys were more comfortable to buy and sell corporate bonds. On the munis side, it seemed like you were more comfortable just buying. And that's the way the SPVs have played out, that the corporate bond facilities got wound down. The MLF still has some outstanding balance. It's in passive runoff, and the facilities had different maturities that they were willing to take. And part of the justification given was, "Oh, we don't want to be disruptive when these things mature or to sell." Fill me in on those three things.**

Singh: Yeah. This became quite a discussion and debate around the end of my time at the Fed. And we just started off by thinking about the likelihood of distress or defaulted exposures across facilities. And then we thought about, "Okay, are there synergies in terms of the potential expertise and vendor relationships that we might need?" And CPFF at that point, and MMLF, were both low usage, short duration, highly rated assets that we've acquired. And so, the probability of a workout was low. The MLF, the credit risk was higher, but the usage was so low that it wasn't as much of a concern. TALF was kind of interesting because it's highly unlikely that we'd have a defaulted asset. These were AAA-rated bonds by multiple agencies and there were no defaults in the 2009 TALF with arguably worse conditions. But even without a default, we could get the collateral put to us because of the terms of the TALF; the participants had that option to put the collateral back to the facility.

TALF didn't have an asset manager to kind of work out that kind of collateral, so that was a need that we had to think about. But really, where the traditional workout needs seemed most necessary were in the PMCCF, SMCCF, and then Main Street. And that's why I mentioned the collaboration of Boston: We really had to figure out whether we could have a single workout vendor that could help us across all three of those facilities. Because in each of them, we were taking more credit risk, there was lower credit quality, and there was moderate usage.

And these were kind of similar types of risks in terms of corporate issuers. Differences in terms of the size of counterparties… But could we find some synergies there? And what could we learn from the Maiden Lane experience? And, from Maiden Lane, I guess what we learned is that there was a different philosophy back then, which was to maximize the return for taxpayers no matter the disruption you cause from selling a distressed asset. And this time, we were much more concerned about taking that approach because if we made it our goal just to get out of defaulted or distressed exposures as quickly as possible to safeguard taxpayers, we could do more damage to the real economy. We didn't feel these markets were fully healed enough to absorb or withstand the Fed selling through its vendors.

And so, we were just starting to think about from a policy standpoint, "What do we want to be our North Star? Is it reputational risk? Is it to maximize the return for taxpayers? Do we want to take a passive role, in which we allow other holders of the debt to take the lead and we just kind of accept the outcome?" And we hadn't reached a conclusion by the time I left. And therefore, we had not figured out exactly what to do in terms of vendor choice. BlackRock had some experience in this regard, but not enough in assets like those that Main Street had acquired. So, we were in the process of talking to other vendors, and some of my colleagues may know exactly where... They must know where the conversations went. By the time I left in February 2021, the decisions had not yet been made.

YPFS: And when you say BlackRock had experience, are you speaking generally or is that Maiden Lane you're referring to?

Singh: Just generally. Certainly, in Maiden Lane too. But generally, they had, at least at one point, reasonable work experience. Actually, I remember looking at the contract. It was not part of our contract with BlackRock to have them handle any workouts that we undertake on our behalf. But, in general, whatever the workout strategy was that we ultimately adopted, we wanted to have a vendor to do the execution rather than have the Fed doing the selling. The optics were much better if we used someone else.

YPFS: Sure. I guess a narrow question on the SMCCF and PMCCF. There was an exclusion of banks in these purchases, and I'm curious what that thinking

was there. The banks are something like 25% of the corporate bond market. So, what was the thinking there to exclude that broad swath of the market?

Singh: They were absolutely flush with reserves. They didn't need us to buy their bonds. They were able to absorb the shock from COVID rather than amplify it in the way they did in '08, '09. So, it didn't seem to us, it was necessary to have them in the broad market index, nor were they asking to be included.

YPFS: Sure. I'm thinking there was probably a lot of folks who weren't asking. I don't think Apple was necessarily asking. So that's the idea then, just that you'd stretch your dollar further if you say, "Look, we're going after this 75% of the market"?

Singh: Yeah. We wanted to concentrate our firepower where it was most needed. We had enough data with the banks to know their capital and liquidity positions were solid. We knew there wasn't a market functioning issue in their securities, as far as we could observe in terms of their ability to raise capital or for secondary market participants to trade their bonds.

Of course, we wanted the banks to make loans to the real economy and amplify the stimulus we were providing for that to occur. But flushing banks with even more liquidity when there wasn't a lot of credit demand was just pushing on a string. So, it was a better use of taxpayer resources to make targeted interventions directly into small businesses or municipalities.

YPFS: Sure. So, I guess just in the last couple minutes here, any broad takeaways that you want to put in the record, either for yourself or future crisis fighters? Any other thoughts on your experience?

Singh: Yes, looking back, I'd highlight a few design and execution principles that served us well. First, the size and scope of the Fed's facilities have been large enough to demonstrate resolve and the capacity to put a floor on the initial effects of the virus shock on the economy; in this regard, the early diagnosis of the shock as being qualitatively different than 2008-09 was critical.

Second, on coordination, facility design was well-calibrated to move in lockstep with Treasury as a force multiplier, even if the effort to coordinate may have slowed the pace of implementation and increased the complexity of execution.

Third, the support was broad-based: By routing liquidity and credit through multiple channels to multiple destinations—households, small/mid-sized/large businesses, state/local governments—facilities have appropriately sought to backstop a broad cross-section of the economy.

Fourth, the execution modalities were flexible: The rollout of the facilities was an iterative to preserve optionality for ramp-up or refinement, depending on the impact of and lessons learned from previous steps.

Lastly, we made all efforts to be responsible: In accordance with our mandate, lending from the facilities has been limited to healthy institutions against collateral at a penalty rate, but with enough flexibility embedded into the terms of eligibility to limit fragmentation that might reignite systemic risk or impair credit provision for key sectors of the economy.

YPFS: **Thanks, Daleep. That's a great place to wrap it. And thanks again for all this. This was great.**

Singh: My pleasure, Steven.

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