A Modification to the Basel Committee's Standardized Approach to Operational Risk

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The U.S. banking regulators will at some point release a proposal to implement the latest changes to the Basel Committee capital framework in the United States. One important novelty of the Basel framework is the introduction of a new capital charge for operational risk, known as the standardized approach for operational risk or "OPE." If the OPE is implemented in the U.S., it would be the first time that a U.S. standardized approach to calculating risk-weighted assets includes an explicit capital charge for operational risk.

The standards promulgated by the Basel Committee use a simple approach to estimate operational risk and determine the minimum required capital. In essence, the OPE uses a financial-statement-based proxy which is based on certain income and expense balance sheet items. This is called the Business Indicator, or BI. Specifically, as further described herein, the BI component utilizes three different types of income streams (each averaged over the last three years) to determine required operational risk capital: interest component; services component; and financial component.

Although the OPE is a significant improvement over the current advanced measurement approach for several reasons, it comes with some important potential drawbacks. In this note we show that banks with business models that rely more heavily on noninterest income (e.g., capital market activities, custodial services) relative to net interest income will have an inappropriately high BI component and therefore an excessive operational-risk capital requirement.

One important novelty in this note is that we estimate the operational risk losses used in the Dodd-Frank Act stress tests and benchmark them against the operational risk capital requirements derived under the OPE. In this comparison, we assume that the OPE's capital requirements apply over a one-year horizon and adjust operational risk losses in DFAST accordingly. There are two key advantages to comparing Basel's capital requirement for operational risk and operational risk losses in DFAST. First, operational risk losses in DFAST are tightly linked to banks' idiosyncratic business and risk profiles. Second, operational-risk losses in DFAST are derived under severe economic conditions, so those estimates are already biased to the upside.

Our results show that the operational risk capital requirement using the OPE is significantly higher than operational risk losses in the stress tests for almost all large banks. The difference in capital requirements is especially elevated for banks with proportionately higher fee revenue and expenses. To avoid an overstatement of the operational risk capital requirement, we investigate a cap to the BI's services component, similar to the 2.25-percent cap that already exists on the BI's interest component. Extending a similar cap to the BI's services component would be a natural extension of Basel's OPE methodology. Analysis shows that introducing a cap on the services component equal to 2.25 percent of total assets (adjusted for certain safe assets) would significantly ameliorate concerns about the existing OPE methodology.

A Brief History of Operational Risk in the Basel Framework

The first Basel Capital Accord was released in 1988 and established a risk-sensitive framework to quantify bank assets, thereby initiating what is now usually referred to as risk-weighted assets.[1] Basel I categorized bank assets into five risk categories and assigned risk weights ranging from 0 to 100 percent to each, based on each category's level of credit risk. The calibration of capital charges in Basel I was designed to reflect these credit risks. The original Basel framework did not separately account for operational risk, but implicitly accounted for it instead in the overall calibration of risk weights and minimum capital ratio requirements. For example, the U.S. banking agencies' October 2005 advance notice of proposed rulemaking for Basel II implementation in the United States noted that capital charges for operational risk (and interest-rate risk) were embedded in the Basel I risk-based capital rules:

> The existing risk-based capital requirements focus primarily on credit risk and generally do not impose explicit capital charges for operational or interest rate risk, which are covered implicitly by the framework. [2]

Operational risk is defined as the risk of losses derived from inadequate or failed internal processes, people, and systems or from external events. The precise types of losses included in this definition have evolved over time. Under Basel I, operational risk generally included any type of unquantifiable risk faced by a bank.[3] In the early 2000s, the BCBS published a set of principles on the management and supervision of operational risk including seven broad types of events that could result in material losses: internal fraud; external fraud; employment practices and workplace safety; clients, products and business practices; damage to physical assets; business disruption and system failures; and execution, delivery, and process management.[4]

Basel II elevated operational risk to a category of its own and assigned it an explicit capital charge. The revised capital framework included three distinct methodologies to calculate the operational-risk capital charge: the basic indicator approach, the standardized approach, and the advanced measurement approach (AMA). The first two approaches were based on fixed percentages of average operating income, with the standardized approach being slightly more granular across business lines than the basic indicator approach. The AMA modeled operational-risk loss exposure using data on each bank's historical experience.

Although the Basel Committee defined the AMA operational-risk exposure as the 99.9th percentile of the distribution of aggregate operational-risk losses over a one-year horizon, making such an estimation with any degree of accuracy is impossible, so taking such estimates seriously is silly. In practice, banks could use various models including scenario analysis or extreme value theory to quantify operational risk. However, the lack of concrete guidance led to huge variability in operational-risk charges across jurisdictions, especially since not all jurisdictions were as permissive in terms of allowing banks to use scenario analysis to lower their AMA models' outputs. The final implementation of the Basel II Accord in the United States only subjected the largest banks to an explicit capital charge for operational risk and required them to use the AMA to determine this charge.

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[1] "History of the Basel Committee." Bank for International Settlements. Available at https://www.bis.org/bcbs/history.htm.

[2] Risk-Based Capital Guidelines; Capital Adequacy Guidelines; Capital Maintenance: Domestic Capital Modifications, 70 Fed. Reg. 61,068 at 61,071 (Oct. 2005).

[3] Power, Michael. "The Invention of Operational Risk." *Review of International Political Economy*, October 2005. Available at (PDF) The Invention of Operational Risk (researchgate.net)

[4] See "Sound Practices for the Management and Supervision of Operational Risk," Basel Committee on Banking Supervision, February 2003. Available at https://www.bis.org/publ/bcbs96.pdf.

The most recent Basel Accord replaces all three Basel II methodologies for operational risk with a new standardized measurement approach. The OPE presents a unified, non-model-based approach that aims to maintain risk-sensitivity of the framework but overcome some limitations of prior approaches. In essence, the OPE combines information from financial statements and historical losses to calculate an operational-risk capital charge.

The Standardized Approach for Operational Risk

The new standardized approach for operational risk calculates operational-risk capital requirements in three steps. First, it estimates a financial-statement-based proxy for operational risk (the BI), using a bank's income and expense items as inputs. The BI is defined as the sum of three components: (1) the interest, leases, and dividend component; (2) the services component; and (3) the financial component. Each component is calculated based on the income generated by the relevant activities. A complete derivation of each of the three components is contained in the Appendix.

Second, the OPE multiplies a bank's BI by a coefficient that increases as the BI rises to generate the Business Indicator Component (BIC). For instance, a bank with a BI between €1 billion and €30 billion is subject to a coefficient of 15 percent, whereas a bank with a BI more than €30 billion is subject to a coefficient of 18 percent. In the last step, the BIC is multiplied by a scaling factor, or internal loss multiplier (ILM), that depends on each bank's average historical losses over the last 10 years. Throughout this analysis, we will assume the ILM is equal to 1, which is permissible in the Basel framework.[5]

Third, the risk-weighted-assets associated with operational risk are defined as:

$$\text{RWA for Operational Risk } = 12.5 \times ILM \ \times BIC \qquad (1)$$

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[5] According to the definition of ILM, it is more likely for the ILM to exceed 1 than to be lower than 1.

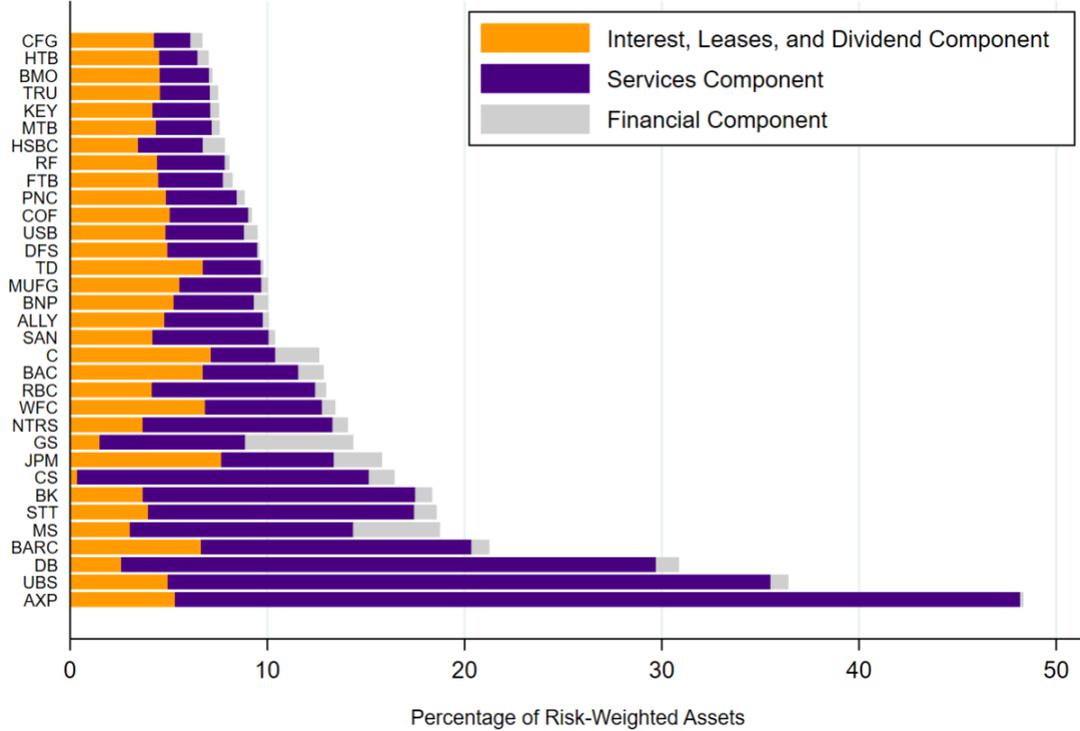## Exhibit 1: Standardized Measurement Approach for Operational Risk

Exhibit 1 plots the RWA for operational risk relative to total RWA as currently defined. The bar chart uses data on bank income statements between 2018 and 2020, since the BI is calculated using an average of financial data over a three-year period (see the Appendix for details). Although which U.S. banks will be subject to OPE under the Basel proposal is still unknown, we have included all banks with more than $100 billion in assets and therefore subject to the Fed's stress tests.[6]

As shown in the chart, the share of RWA for operational risk across large banks varies widely. Specifically, the share of operational risk in total RWA varies from 6.7 percent for Citizens Financial Group (CFG) to 48.3 percent for American Express (AXP). As the purple portions of the bars show, the services component generates a significant share of RWA for operational risk, especially for banks that tend to have the highest operational risk capital requirement.[7]

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[6] This set of banks represent the largest cohort that allows us to compare Basel's operational-risk requirement with losses associated with operational risk events in the Fed's stress tests.

[7] The operational risk requirement is higher for larger banks, so relative to revenues the outliers are the largest banks followed by AXT.
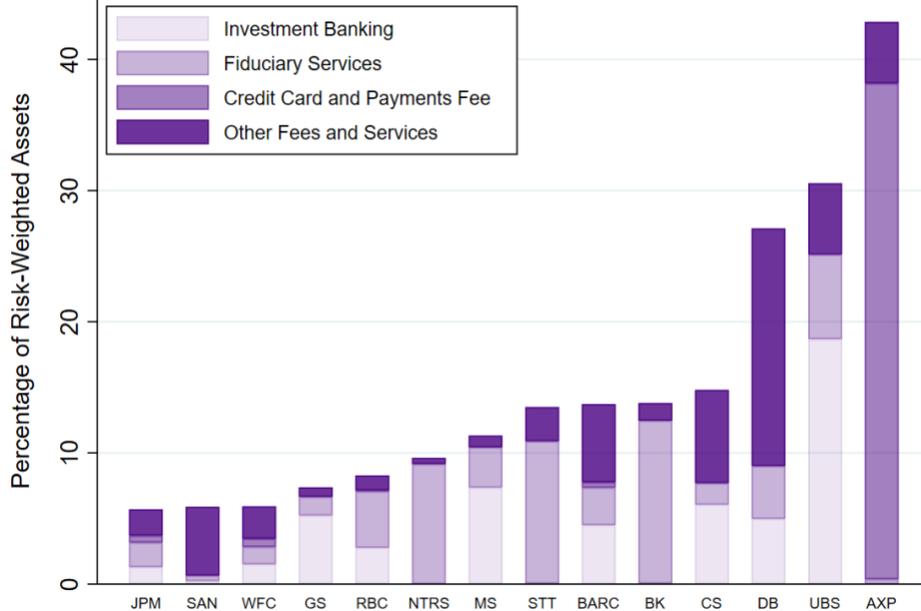
Exhibit 2: Services Component

Exhibit 2 breaks out the services component for banks for which the share of RWAs generated from the services component is highest and shows the portions of RWA generated from investment banking, fiduciary services, credit card and payments fees, and other fees and services. The portion of the services component generated by credit card and payments fees alone would account for nearly 40 percent of AXP's RWA. For UBS, investment banking fees generate an operational risk-based RWA that would account for about 20 percent of the firm's aggregate RWA. For DB, income from other fees and services would also generate nearly 20 percent of its aggregate RWA.

The services component of the OPE drives these outsized operational risk charges because the BI formula generates higher RWAs from noninterest income than from interest income. Specifically, the operational risk capital requirement tied to interest income offsets interest income with interest expense and is no higher than 2.25 percent of interest-earning assets. By contrast, the operational risk capital charge tied to noninterest income does not offset revenues with expenses and it is uncapped. The decoupling between the interest and services components penalizes banks with a business mix tilted toward noninterest income in the absence of any evidence of higher operational risk. In addition, the differences in capital requirements across the interest and services components misaligns the risk of banking products that generate both interest income and noninterest revenue, such as credit cards.

This overstatement of risk for banks whose business mix is tilted towards noninterest revenues, could be corrected by capping the BI's services component at 2.25 percent of a banking institution's total assets (less reserve balances, Treasuries, and Agency MBS to mitigate procyclicality).[8] For some lines of business, it would also be logical to offset fee income with fee expense because the product generating the two flows is the same (e.g., credit card fees are aligned with credit card member rewards). However, for other firms, the fee income source is

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[8] The argument to also exclude Treasuries and Agency MBS in addition to deposits at Federal Reserve Banks is that in a downturn loan demand is weak and banks hold a larger share of their portfolios in securities.

mainly from investment banking and fiduciary fees while the major source of expenses comes from brokerage and clearing activities. In this latter case, offsetting fee income with fee expenses is less straightforward because there is less of a comparable relationship between services offered and services used. That said, this is a topic that deserves further analysis beyond the one done in this note.

Losses Associated with Operational Risk Events in the Federal Reserve Stress Tests

The Federal Reserve's stress tests estimate losses associated with operational risk events for banks above $100 billion in assets using banks' own historical data on operational risk losses. Those projections offer a robust reality check against the capital requirements for operational risk calculated in Exhibit 1. The level of losses associated with operational risk events in the stress tests depends significantly on the severity of the stress scenarios. In addition, since the losses in the stress tests are derived using banks' own historical data, analyzing the correlation between OPE's capital charges and operational risk losses in the Fed's stress tests is also useful.

One key challenge is that bank-level losses associated with operational risk events in the stress tests are not disclosed but are included in the noninterest expense projections. Fortunately, the projections of noninterest expense are publicly available. The Federal Reserve provides a description of the models used to generate the projections of noninterest expense without operational risk losses in the stress tests. Moreover, those projections rely entirely on data from banks' FR Y-9C regulatory reports, which are publicly available. Therefore, we estimate losses associated with operational risk events in the stress tests as the difference between the Federal Reserve's projections of noninterest expense and the projections based on our own models and publicly available data. In addition, the Federal Reserve also publishes aggregate operational risk losses in the stress tests for all firms— another useful datapoint to help calibrate our estimates.

The supervisory stress test methodology document states that the Federal Reserve uses three regression equations to project the components of noninterest expense in the stress tests: compensation expense; fixed assets expense; and all other noninterest expense, excluding operational risk losses and OREO expenses.[9] The supervisory models are estimated using data from the FR Y-9C. These data are publicly available, so it is therefore possible to approximate some of the assumptions the Federal Reserve uses in its projections, excluding operational risk losses and OREO expenses. The projections are based on autoregressive models that relate each specific noninterest expense subcomponent (expressed as a share of total assets) to macroeconomic variables, previous values of the expenses, bank fixed effects, and other bank-specific variables.

The Federal Reserve's description of expense models offers useful information about the functional form of the regression models, but it does not say precisely which macroeconomic or bank-specific variables are included in each regression. Based on an analysis of DFAST 2020 results, we find that compensation expenses and other noninterest expenses are positively correlated with stock returns, while real GDP growth drives some of the variation in expenses of premises and fixed assets.

The Federal Reserve uses banks' own historical data on operational risk losses to develop two different modelling approaches during its stress testing exercise: a linear regression model and a historical simulation model. The regression model correlates operational risk losses with macroeconomic variables such as BBB spreads, the house

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[9] The Federal Reserve excludes operational risk losses and OREO expenses from all other noninterest expense because there is a separate supervisory model that estimates losses from fraud, employee lawsuits, litigation-related expenses, or computer system or other operating disruptions. We removed these types of expenses from all other noninterest expense using the information from the write-in fields for other noninterest expense. We also exclude goodwill impairment losses and amortization expense from noninterest expense.

price index, and the unemployment rate. Operational losses are estimated for the full sample of banks. The share of losses allocated to a given firm is a function of the size of the firm, measured by the total assets of each bank.
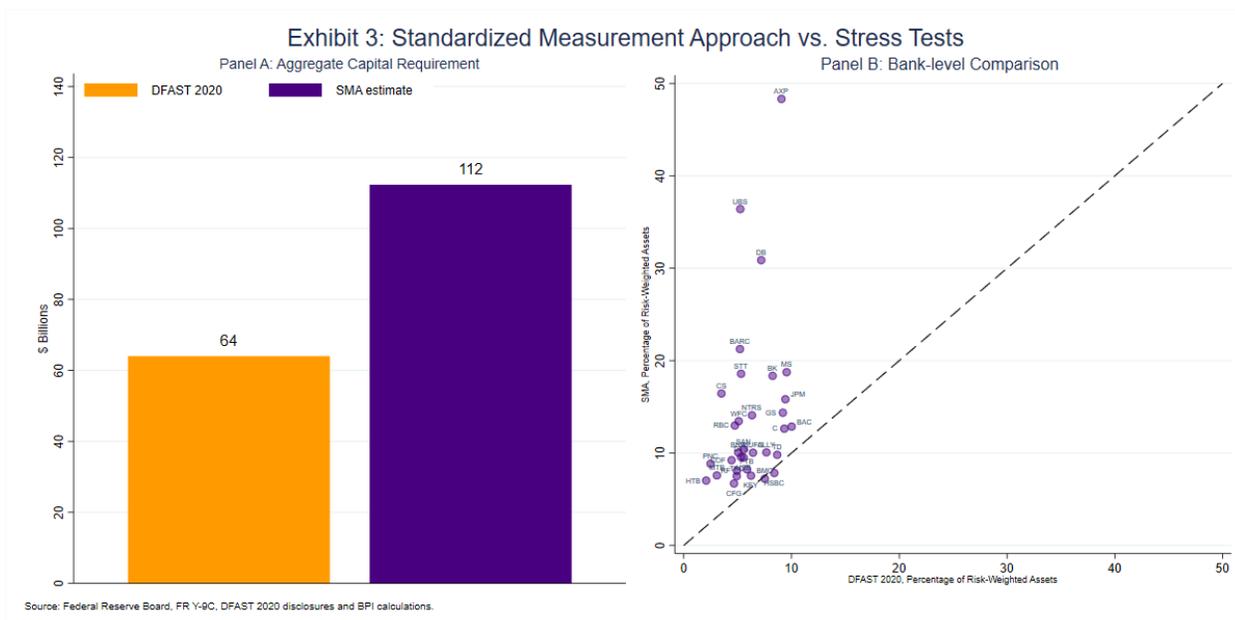
The historical simulation model attempts to capture historical variation in operational risk losses across seven different types of operational risk events based on data the Fed receives directly from the firms. The projected operational risk losses used in the Fed's stress tests are calculated as an average of losses obtained from each model.

We will also follow a similar approach and average the projections for operational risk losses from the regression model with those obtained by allocating aggregate projected operational risk losses from the stress tests using bank size. Next, we divide our estimate by 2.25 percent to transform a nine-quarter projection into a yearly estimate, to ensure the OPE and the estimates from the stress test results conform to the same time horizon. Finally, we multiply the stress test projections by 12.5 to transform the operational risk losses into a risk-weighted assets metric.

An appropriate strategy to assess the overall calibration of the OPE is to compare operational risk losses in the stress tests with the operational risk capital requirement calculated using the OPE. Also, our estimates make a conservative assumption and assume the tax rate to be zero; the assumption is conservative because bank profits are typically below zero under stress.[10] Operational risk losses are a reasonable proxy for capital needs, because losses feed directly to bank capital through declines in net income and retained earnings. Since operational risk losses in the stress tests are estimated conditional on a stress scenario, it is also reasonable to compare the aggregate and bank-specific operational risk losses directly with the capital requirements calculated using OPE. Had those losses not been derived under stress conditions, it would be more appropriate to look at the distribution of operational risk losses and compare the tail of the distribution to OPE's capital requirement.

First, the minimum aggregate operational risk capital under OPE being nearly twice as high as the aggregate operational risk losses in DFAST 2020 as shown in Panel A in Exhibit 3. Cumulative operational risk over the nine quarters of the projection horizon equaled $144 billion in aggregate for the 33 banks. Annualizing those losses to a one-year horizon yields losses of $64 billion under the Federal Reserve's severely adverse scenario in DFAST 2020. In addition, the OPE methodology results in higher operational risk capital requirements for 31 of the 33 firms that participated in the 2020 stress tests.

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[10] This assumption also helps simplify the analysis. In practice, banks can use deferred tax assets to lower future taxable income, so negative taxes can increase capital in some cases.

Exhibit 3: Standardized Measurement Approach vs. Stress Tests

Source: Federal Reserve Board, FR Y-9C, DFAST 2020 disclosures and BPI calculations.

Second, as shown in Panel B in Exhibit 3, there are some sizable outliers for minimum operational risk capital under OPE relative to DFAST. The x-axis measures the annualized losses associated with operational risk events in the Fed's stress tests, and the y-axis represents the share of RWA for operational risk under the OPE. In addition, the correlation between the OPE capital requirement and operational risk losses in DFAST is low because the dots lie vertically on the top of each other. More precisely, the correlation between OPE's operational risk capital requirement and operational-risk losses in the stress tests is only 29 percent. The correlation would jump to 59 percent if AXP, foreign-bank organizations with an elevated capital markets presence (UBS, CS, DB, BARC), and STT were excluded from the sample.

All together, these findings suggest that the capital requirement for the services component is overstated in OPE.

Adjustment to BI's Services Component

The current specification of OPE disproportionately penalizes business models with a high percentage of noninterest income in total revenues for two main reasons. First, unlike the interest component, the services component does not offset revenues with expenses. Second, there is no cap on the BI's services component. The solution we discuss in this section is to introduce a cap to the BI's services component similar to the one already in place for the interest component.

A cap tied to total assets is preferable to one tied to interest-earning assets, since the services component covers noninterest income. Furthermore, deducting deposits at Federal Reserve Banks, U.S. Treasuries, and Agency MBS from total assets would better reflect operational risk and reduce the procyclicality of the cap. We know that during economic downturns, the Federal Reserve tends to expand its balance sheet as it conducts asset purchases. This causes a large influx of reserve balances into the banking system, since only banks can hold deposits at Federal Reserve Banks. In addition, banks typically use their excess liquidity to purchase Treasury securities and Agency MBS.

Exhibit 4: Adjusted Capital Requirement for Operational Risk
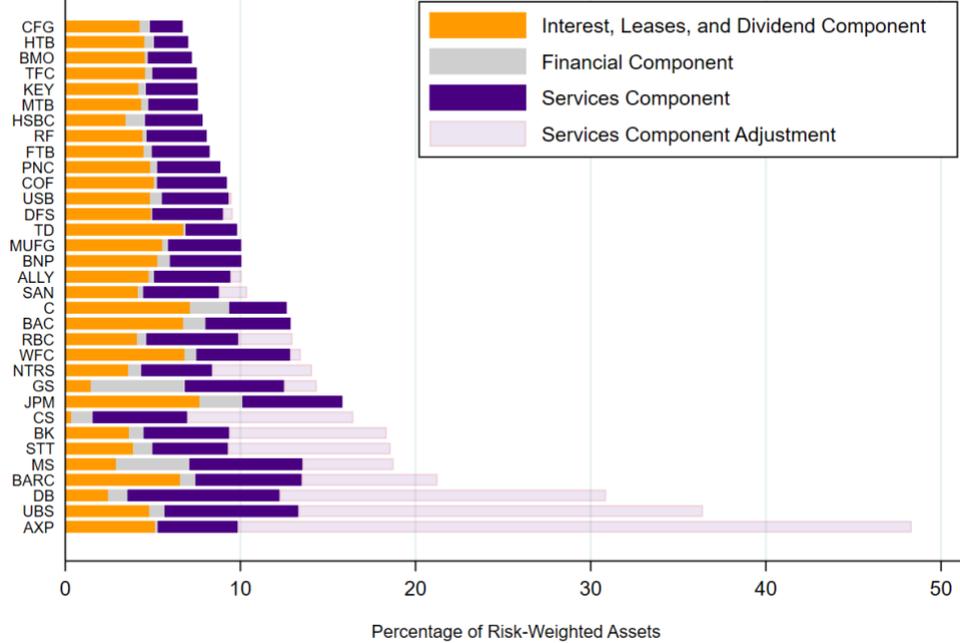
A cap on the BI's services component equal to 2.25 percent of total adjusted assets would be binding for 15 out of the 33 CCAR banks.[11] That is approximately the same number of banks bound by the BI's cap on the interest component. In Exhibit 4, we plot the adjusted RWA for operation risk for all the banks in the sample. In the revised formulation, AXP has a capital charge near 10 percent of RWA instead of 48 percent, as shown in Exhibit 1. Foreign-bank organizations with high capital markets presence (UBS, DB, CS, and BARC) would also benefit by having a cap on the services component. In addition, the correlation between the adjusted OPE capital charge and operational risk losses in the stress tests would increase from 29 to 53 percent. Finally, the Basel III capital requirement for operational risk would decline from $112 billion to $99 billion, or 11.6 percent. Still, the Basel III operational risk capital requirement would exceed operational-risk losses in the stress tests over a one-year horizon.

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[11] There is no special reason to choose 2.25 percent, except that it is identical to the cap on the interest, leases, and dividend component.

Conclusion

The OPE methodology to calculate capital charges for operational risk in the Basel III endgame proposal offers a simplified, non-model, financial-statement-based approach that resolves some problems related to the large variability in capital charges under the previous methodologies introduced by Basel. Although the calculation allows for calibration based on actual historical losses, a misalignment of certain requirements leads to capital charges significantly and inappropriately higher than operational risk losses in the Fed's stress tests, especially for banks with business models tilted toward noninterest revenues. This problem could largely be corrected by imposing a cap on BI's services component. Furthermore, deducting reserves, Treasuries and agency MBS securities would not only further enhance accuracy but also make the requirement less procyclical.

Appendix

The new standardized measurement approach for operational risk calculates operational capital requirements in three steps. First, it estimates a proxy for operational loss exposure by aggregating financial statement data based on three types of revenue streams (interest, services, and financial) to generate the Business Indicator (BI). Second, the BI is then multiplied by marginal capital requirement coefficients to obtain the Business Indicator Component (BIC). Third, the BIC is multiplied by an adjustment factor called the Internal Loss Multiplier (ILM), which compares the BIC with actual historical operational losses over the last decade.[12] We describe each component of the BIC in detail below.

$$\text{Minimum operational risk capital } (ORC) = BIC * ILM \tag{1}$$

In this appendix, we present the relevant business indicator formulas and explain our methodology and adjustments in detail. In the formulas below, a bar above a term indicates that the term is calculated as the average over three years: t, t − 1, and t − 2. We will be using 2018, 2019, and 2020 for our three years when calculating the variables.

A detailed item-by-item mapping of the Business Indicator to FRY-9C items can be found in Table 2.

Business Indicator

The BI has three components: the interest, leases, and dividend component (ILDC); the services component (SC), and the financial component (FC).

The BI is defined as:

$$BI = ILDC + SC + FC \tag{2}$$

Interest, Leases, and Dividend Component. The ILDC quantifies risks coming from shocks to net interest income. It compares the absolute value of net interest income over the last three years to a reference value of 2.25 percent of total interest earning assets. The ILDC takes the minimum of both metrics and then adds total dividend income from unconsolidated entities to obtain a measure of potential operational risk stemming from interest revenues.

$$ILDC = Min\left[\overline{Abs(\text{Interest Income} - \text{Interest expense})}; 2.25\% \times \overline{\text{Interest Earning Assets}} \right] \\ + \overline{\text{Dividend Income}} \tag{3}$$

The interest income from the FRY-9C schedule HI Item 3 is adjusted according to the BCBS guidelines for operating leases other than investment property disclosed as other expenses under the classification in Schedule HI item 7n to 7p. The absolute value of net items (e.g., interest income – interest expense) is calculated first year by year and then averaged over three years.

Interest earnings assets are defined according to the New York Federal Reserve stress testing methodology (see Hirtle et al. 2015). This includes interest-bearing balances, hold-to-maturity and available-for-sale securities, federal funds sold in domestic offices, securities purchased under agreements to re-sell, trading assets, and total loans and leases.

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We do not have available data for dividend income from investments in stocks and funds not consolidated in the bank's financial statements, including dividend income from non-consolidated subsidiaries, associates, and joint ventures.

Services Component. The SC captures income and expenses received from offering advice and services. For example, this includes but is not limited to activities such as securities issuance, clearing and settlement, or fees obtained through asset management business. The BCBS definition aggregates revenues and expenses into those related to fees and those representing other operating income. Finally, the maximum of fee income or expense is added to the maximum of other operating income or expenses, as in this formula.

$$SC = Max\left[\overline{\text{Other Operating Income}}; \overline{\text{Other Operating Expense}}\right] + Max\left[\overline{\text{Fee Income}}; \overline{\text{Fee Expense}}\right] \qquad (4)$$

We do not have available data for other operating income, defined as income from ordinary banking operations not included in other BI items but of similar nature (income from operating leases should be excluded). We define other operating expense using Schedule HI memoranda items 7n to 7p when related to losses incurred because of operational loss events (e.g., fines, penalties, settlements, replacement cost of damaged assets), which have not been provisioned/reserved for in previous years; or expenses related to establishing provisions/reserves for operational loss events.

We use fee income as established by the FRY-9C: (1) Income from fiduciary activities; (2) service charges on deposit accounts; (3) fees and commissions from securities brokerage and investment banking activities; (4) venture capital revenues; and (5) servicing and securitization income. We exclude fee income from insurance or re-insurance business as stated by BCBS.

We define fee expense as Schedule HI item 7e *"Other noninterest expense"* from the FRY-9C. We adjust this metric downward to better reflect BCBS definition. This adjustment includes: (1) fees paid by the bank for the supply of non-financial services (e.g., travel expenses, IT services, and general administrative costs); (2) for operating lease expenses; and (3) for expenses included in *"Other operating expense"* above.

Our adjustment to the services component introduces a cap to the BI's services component by taking the minimum of the original services component and 2.25 percent of total adjusted assets. Total adjusted assets subtract reserve balances, U.S. Treasuries, and Agency MBS from total assets.

$$Adjusted\ SC = Min\ [\ SC\ , 2.25\%\ \times\ \text{Total adjusted assets}] \qquad (5)$$

Financial Component. The FC adds the absolute value of the profit and loss coming from the banking book and the trading book to obtain a proxy for the firm's exposure to net financial operating losses.

$$FC = \overline{Abs(\text{Net P\&L Trading Book})} + \overline{Abs(\text{Net P\&L Banking Book})} \qquad (6)$$

Net P&L for the trading book is defined as trading revenues determined according to the definition of the Federal Reserve Bank of New York stress testing methodology (see Hirtle et al. 2015).

Net P&L for the banking book follows the FRY-9C mapping of realized gains and losses from the trading book, including: (1) net gains (losses) on the sale of other assets, (2) realized gains on held-to-maturity securities, and (3) realized gains (losses) on available-for-sale debt securities.

Business Indicator Component

Once these three elements are added to obtain the Business Indicator, the BCBS guidelines apply marginal coefficients to obtain an intermediate capital charge.

Table 1: BI Ranges and Marginal Coefficients

Bucket	BI Range (€bn)	BI Marginal Coefficients
1	$BI \leq 1$	12%
2	$1 < BI \leq 30$	15%
3	> 30	18%

Note: The analysis assumes a €/U.S.$ exchange rate of 1.13. [2]

To calculate the BIC, the BI is multiplied by the marginal coefficients. For example, for banks with a BI of €40 billion, the following BIC would apply: First bucket impact of (1 × 12%), a second bucket impact of (30 − 1) × 15%, and a final bucket impact of (40 − 30) × 18% = €6.27 billion.

Internal Loss Multiplier

And finally, the intermediate capital charge can be scaled to account for historical operational risk losses through an adjustment factor. The internal loss multiplier (ILM) compares the potential losses estimated through the BIC to actual average historical losses over a period of 10 years using the following formula:

$$ILM = Ln\left(\exp(1) - 1 + \left(\frac{LC}{BIC}\right)^{0.8}\right) \tag{7}$$

The loss component (LC) is calculated as 15 times the net annual operational losses and then averaged over a window of the last 10 years. If the LC equals the BIC, then no adjustment factor is needed and the ILM is equal to 1. If, on the other hand, actual historical losses are above those calculated by the BIC, then the ILM would be higher than 1 and the minimum operational risk capital would be adjusted upward to reflect the incremental risk associated with higher historical losses. ILM is set to 1 throughout this research note.

Table 2: Mapping of BCBS Operational Risk Items to the FRY-9C Reporting Form

Item	FRY-9C item	Description
Interest Income	BHCK4107	Total interest income
Interest Expense	BHCK4073	Total interest expense
	+ operating lease adjustment	Adjustment for operating leases expenses (see Table 3 for details)
Interest Earning Assets	BHCK0395	Interest-bearing balances: in U.S. offices
	+ BHCK0397	Interest-bearing balances: In foreign offices, Edge and Agreement subsidiaries, and IBFs

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[2] We use a €/U.S.$ exchange rate of 1.13.

Item	FRY-9C item	Description
	+ BHCK1754	Total Securities, MBS, ABS and Other Debt Securities Held-to-Maturity at Amortized Cost (from Schedule HC-B)
	+ BHCK1773	Total Securities, MBS, ABS and Other Debt Securities Available-for-Sale at Amortized Cost (from Schedule HC-B)
	+ BHDMB987	Federal funds sold in domestic offices
	+ BHCKB989	Securities purchased under agreements to resell
	+ BHCK3545	Trading assets (from Schedule HC-D)
	+ BHCK2122	Total Consolidated loans and leases held for investment and held for sale
Dividend Income	–	–
Fee Income	BHCK4070	Income from fiduciary activities
	+ BHCK4483	Service charges on deposit accounts in domestic offices
	+ BHCKC886	Fees and commissions from securities brokerage
	+ BHCKC887	Fees and commissions from annuity sales
	+ BHCKC888	Investment banking, advisory, and underwriting fees and commissions
	+ BHCKKX46	Fees and commissions from securities brokerage, investment banking, advisory, and underwriting fees and commissions
	+ BHCKB491	Venture capital revenue
	+ BHCKB492	Net servicing fees
	+ BHCKB493	Net securitization income
	+ BHCKB497	Other noninterest income
Fee Expense	BHCK4092	Other noninterest expense
	– operating lease adjustment	Adjustment for operating leases expenses (see Table 3 for details)
	– BHCKC018	Printing, stationery, and supplies expense
	– BHCK4803	Postage expense
	– BHCKF559	Telecommunications expense
	– [BHCK8565 + BHCK8566 + BHCK8567]*	Adjustment for outsourcing fees paid for the supply of non-financial services (see Table 3 for details)
Total Assets Adjusted	BHCK2170 – [BHCK0081 + BHCK0395 + BHCK0397] – [BHCK0213 + BHCK1287 + BHCM3531] – [BHCKG303 + BHCKG307 + BHCKG311 + BHCKG315 + BHCKK145] – [BHCKG301 + BHCKG305 + BHCKG309 + BHCKG313 + BHCKK143] – [BHCKG380 + BHCKG379]	Total assets Cash and balances due from depository institutions U.S. Treasuries (AFS, HTM, Trading) Agency mortgage-backed-securities (AFS) Agency mortgage-backed-securities (HTM) Agency mortgage-backed-securities (Trading)

Item	FRY-9C item	Description
Other Operating Income	–	–
Other Operating Expense	[BHCK8565 + BHCK8566 + BHCK8567]**	Adjustment for expenses and losses incurred because of operational loss events (see Table 3 for details)
Net P&L Trading Book	BHCKA220	Trading revenue
Net P&L Banking Book	BHCK8560 + BHCK8561 + BHCKB496	Net gains (losses) on sales of loans and lease Net gains (losses) on sales of other real estate owned Net gains (losses) on sales of other assets
	+ BHCK3521	Realized gains (losses) on held-to-maturity securities
	+ BHCK3196	Realized gains (losses) on available-for-sale debt securities

*Only items related to outsourcing fees paid for the supply of non-financial services are selected from items BHCK8565, BHCK8566, and BHCK8567 (see Table 3 for details).

**Only items related to expenses and losses incurred because of operational loss events are selected from items BHCK8565, BHCK8566, and BHCK8567 (see Table 3 for details).

Table 3: Definitions of Adjustment Items

Memoranda Items BHCK8565, BHCK8566, and BHCK8567 from Schedule HI of the FRY-9C forms outline additional disclosure on "Other Noninterest expense". We categorize these items into three adjustments: (1) operating lease and expense; (2) outsourcing fees paid for the supply of non-financial services; and (3) expenses and losses incurred as a consequence of operational loss events. We follow the definitions contained in *Finalizing Post Crisis Reforms* (BCBS 2017) and *Policy Advice on Basel III Reforms: Operational Risk* (EBA 2019).

Item	FRY-9C disclosure
Adjustment for operating leases and expense	Depreciation expenses of operating leases
	Loan and lease expense
Adjustment for outsourcing fees paid for the supply of non-financial services	Capitalized computer software expense
	Depreciation and amortization of technology assets
	General administrative expense
	IT professional services
	Software licensing and maintenance expenses
	Technology expense
	Technology services
	Travel and entertainment
	Travel expense
Adjustment for expenses and losses incurred as a consequence of operational loss events	Accrual for legal matters
	Fraud losses
	Increase provision for litigation
	Insurance losses
	Legal and risk provisions
	Litigation expense
	Operating losses
	Provision for contingent liability

Table 4: Derivation of Minimum Operational Risk Capital for American Express (Illustrative Example)

U.S.$ in Billions*	2018	2019	2020	Average
Net Interest Income	7.7	8.6	8.0	8.1
Adjustment for Operating Leases Expense	0.0	0.0	0.0	0.0
Net Interest Income Adjusted	7.7	8.6	8.0	8.1
Interest Bearing Balances	22.2	18.2	27.5	22.6
Total—HTM Securities	0.0	0.0	0.0	0.0
Total—AFS Securities	4.8	8.5	21.7	11.6
Federal Funds Sold in Domestic Offices	0.0	0.0	0.0	0.0
Securities Purchased Under Agreements to Re-sell	0.1	0.1	0.1	0.1
Trading Assets	0.0	0.0	0.0	0.0
Total Loans and Leases	141.5	149.5	119.9	137.0
Total Interest Earning Assets	168.6	176.3	169.2	171.4
Dividend Income	–	–	–	
2.25% of Interest Earning Assets				3.9
Interest, Leases, and Dividend Component (ILDC)				3.9

*Source: FRY-9C; balance sheet items are end of year. P&L data are for the full fiscal year.

Table 4: Derivation of Minimum Operational Risk Capital for American Express (Illustrative Example cont'd)

U.S.$ in Billions*	2018	2019	2020	Average
Other Operating Income	–	–	–	
Other Operating Expense	0.0	0.0	0.0	0.0
Income from Fiduciary Activities	0.0	0.0	0.0	0.0
Service Charges on Deposit Accounts in Domestic Offices	0.0	0.0	0.0	0.0
Fees and Commissions from Securities Brokerage	0.0	0.0	0.0	0.0
Investment Banking, Advisory, and Underwriting Fees and Commissions	0.0	0.0	0.0	0.0
Fees and Commissions from Annuity Sales	0.0	0.0	0.0	0.0
Venture Capital Revenue	0.0	0.0	0.0	0.0
Net Servicing Fees	0.0	0.0	0.0	0.0
Net Securitization Income	0.0	0.0	0.0	0.0
Other Noninterest Income	32.3	34.5	27.8	31.5
Total Fee Income	32.3	34.5	27.8	31.5
Fee Expense	22.8	25.0	20.7	22.8
Adjustment for Outsourcing Fees Paid for the Supply of Non-Financial Services	0.0	0.0	0.0	0.0
Fee Expense Adjusted	22.8	25.0	20.7	22.8
Services Component (SC)				31.5
Net P&L Trading Book	0.1	0.1	0.1	0.1
Net P&L Banking Book	0.0	0.0	0.0	0.0
Financial Component (FC)				0.1
Business Indicator (BI)				35.5
Business Indicator Component (BIC)				5.3
Internal Loss Multiplier (ILM)				1.0
Minimum Operational Risk Capital (ORC)				5.3
Minimum Operational Risk Capital (as a Percentage of Risk-Weighted Assets)				48.3

*Source: FRY-9C; balance sheet items are end of year. P&L data are for the full fiscal year.

Table 5: Adjusted Derivation of Minimum Operational Risk Capital for American Express

U.S.$ in Billions*	2018	2019	2020	Average
Interest, Leases, and Dividend Component (ILDC)				3.9
Services Component (SC) Prior to Cap				31.5
Total Assets Adjusted	157.5	166.7	137.9	154.0
2.25% of Total Assets Adjusted				3.5
Services Component (SC) Adjusted				3.5
Financial Component (FC)				0.1
Business Indicator (BI)				7.5
Business Indicator Component (BIC)				1.1
Internal Loss Multiplier (ILM)				1.0
Minimum Operational Risk Capital (ORC)				1.1
Minimum Operational Risk Capital (as Percentage of Risk-Weighted Assets)				9.8