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Sweden: Corporate Bond Purchases¹

Carey K. Mott²

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Abstract

In the spring of 2020, corporate revenues in Sweden felt the direct effects of the coronavirus pandemic and the resulting public health measures. With future cash flows in question, many investors sold corporate debt for safe assets. Sweden's corporate bond market—particularly vulnerable to stress due to its heterogeneity, fragmentation, and lack of transparency—saw diminished liquidity. On March 19, 2020, the Sveriges Riksbank (Riksbank) announced it would purchase commercial paper and corporate bonds as part of a much larger bondbuying scheme, announced three days earlier, that included Swedish government, municipal, and covered bonds. It authorized the program under Chapter 6, Article 5 of the Sveriges Riksbank Act. Commercial paper purchases began soon after this announcement, but corporate bond purchases did not commence until September 2020. Although corporate credit conditions had improved by then, the Riksbank sought to establish a presence on the corporate bond market so it could scale purchases if needed. In June 2020, the Riksbank said it would limit its purchases to a nominal SEK 10 billion (about USD 1.2 billion), but it later raised the limit to SEK 13 billion. The program purchased kronor-issued, investment-grade bonds on the secondary market with maturities of less than five years. Later that year, the Riksbank announced purchases would be further limited to issuers complying with certain carbon emissions standards. Purchases peaked at SEK 445 million the week of February 15, 2021. After an extension to its original expiration date of June 30, 2021, the program formally expired on December 31, 2021. In November 2021, the Riksbank announced it would replace maturing bonds in order to maintain its net holdings, a practice it would review each quarter.

Keywords: corporate bonds, COVID-19, market liquidity, Sveriges Riksbank, Sweden

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Overview

Sweden, like other countries, responded to COVID-19 pandemic with restrictions and precautionary measures to control the health crisis (Riksbank 2020u; Riksbank 2020b; Riksbank 2020c). As corporate revenues suffered, investors worried whether many companies would survive. Equity markets became highly volatile and share prices fell dramatically (Wollert 2020; Riksbank 2020b). A flight to safe assets ensued, and liquidity on the Swedish bond market dried up. The intense selling pressure caused severe funding problems for nonfinancial corporations who funded themselves with market financing, especially those firms that needed to refinance in a stressed market (Wollert 2020).

Sweden's corporate bond market was particularly vulnerable due to the large share of unrated companies (Riksbank 2020o; Wollert 2020). The market is distinguished by a lack of transparency in pricing and trading, leading to unreliable pricing. A large share of issuance is from property companies, which were disproportionately affected by the coronavirus pandemic (Wollert 2020).

In primary markets, issuance of new bonds became expensive. For a period in March 2020, investors and issuers could not agree on prices amid a depleted investor base and **Key Terms**

Purpose: "... together with the purchases of commercial paper that are already in progress, [to] keep companies' funding costs down and reinforce the Riksbank's capacity to act if the credit supply to companies were to deteriorate" (Riksbank 2020q).

Launch Dates	Authorized: March 16, 2020			
	Announced: March 19, 2020			
Operational Date	September 14, 2020			
End Date	December 31, 2021			
Legal Authority	Chapter 6, Article 5 of the Sveriges Riksbank Act (1988:1385)			
Administrators	Sveriges Riksbank			
Overall Size	Originally limited to SEK 10 billion, later raised to SEK 13 billion			
Purchased Assets	Investment-grade corporate bonds issued in Swedish kronor by Swedish non-financial corporations			
Peak Utilization	SEK 445 million during the week of February 15, 2021			

no new bonds were issued (Wollert 2020). Meanwhile, risk premiums rose in secondary markets³, where the Riksbank observed a lack of liquidity and transparency amid low market activity (Riksbank 2020o).

The Riksbank sought to arrest further deterioration in credit lending by announcing dual measures to support commercial paper and corporate bonds. In a series of press releases,

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³ Typically an increase in risk premia on the secondary market leads investors to increase their required rate of return for new bonds issued on the primary market, compounding problems in the Swedish bond market (Wollert 2020).

the Riksbank announced its intent to purchase up to a nominal SEK 32 billion⁴ in commercial paper beginning in April 2020 and a nominal SEK 10 billion in corporate bonds⁵ beginning in September 2020 (Riksbank 2020o; Wollert 2020). The Riksbank increased the limit on corporate bond purchases to SEK 12 billion in April 2021 and to SEK 13 billion on June 30, 2021 (Riksbank 2021e; Riksbank 2021f).

Corporate bond purchases were viewed as "a complement" to commercial paper purchases and a means for the Riksbank to establish a presence on these markets. The Riksbank said it was positioning itself to expand purchases "if monetary policy needed to be made more expansionary" (Riksbank 2020q; Riksbank, n.d.j). Purchases began on September 14, 2020. The Riksbank purchased bonds on the secondary market from its monetary policy counterparties. It limited purchases to non-subordinated corporate bonds issued by non-financial companies with credit ratings equivalent to Baa3/BBB- or higher and a remaining maturity of up to five years (Riksbank 2020q). The Riksbank only purchased kronor-issued bonds, which represent less than half of Swedish bonds (Wollert 2020; Riksbank 2020o). On December 16, 2020, the Riksbank updated its eligibility criteria, announcing it would only purchase corporate bonds issued by companies "assessed to comply with international standards and norms for sustainability" (Riksbank 2021d). In January 2021, the Riksbank began measuring the carbon footprint of its corporate bond portfolio (Riksbank 2021d; Andersson and Stenström 2021).

Riksbank's total holdings of corporate bonds reached SEK 10 billion in late June 2021, around the originally announced expiration date of the program, and SEK 12.2 billion by October 2021, net of maturities (Riksbank, n.d.l). On November 25, 2020, the Riksbank announced it would extend its purchases of corporate bonds, as well as the other assets in its purchasing program, to December 31, 2021 (Riksbank 2020l; Riksbank 2020z).

Summary Evaluation

The market for corporate debt recovered shortly after the Riksbank announced on March 19 its intent to purchase commercial paper in April and corporate bonds sometime between March and December 2020.⁶ By June, commercial paper purchases had peaked and Riksbank's total holdings topped SEK 6 billion. In the corporate bond market, kronor-denominated issue volumes had begun to recover and risk premiums and yields had begun to decline (Riksbank 2020f; Wollert 2020). In July, the Riksbank found that yields on safe bonds had stabilized, risky asset prices had returned to normal, and differentials between

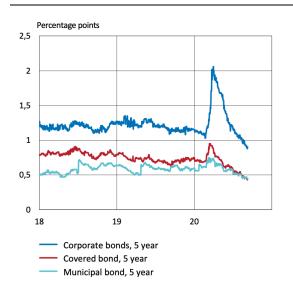
 $^{^4}$ Per Yahoo Finance, USD 1 = SEK 10.01 on April 1, 2020. The Riksbank calculated its holdings of bonds in "nominal" terms; that is, based on the bond's principal amount without including any interest payments (Riksbank, n.d.d).

⁵ In May 2020, the outstanding volumes of commercial paper and corporate bonds stood around SEK 134 billion and SEK 1.25 trillion, respectively (Riksbank 2020m, 20). For more information on the Riksbank's commercial paper purchases, see Mott (2021).

⁶ Following the announcement in March 2020, the Riksbank conducted an analysis of the Swedish corporate bond market prior to initiating corporate bond purchases in September 2020 (Hansson and Birging 2021).

risky and safe assets had decreased (Riksbank 2020p) (see Figures 1 and 2). By August, before the Riksbank corporate bond purchases began, the Riksbank observed the Swedish market for corporate bonds was functioning in a "satisfactory" manner, which "could to some extent be due to the Riksbank's announcement of its intention to purchase these securities" (Riksbank 2020o).

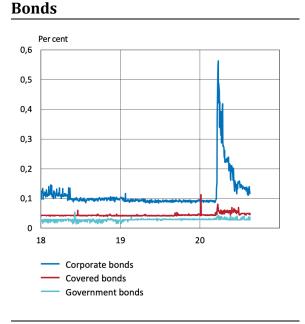
Figure 1: Yield Spread Between Bonds and Government Bonds



Data retrieved from Bloomberg, Macrobond, Refinitiv, and the Riksbank. Corporate bonds for companies with credit ratings of BBB or higher. Yield spread in relation to the government bond yield.

Source: Wollert 2020.

Figure 2: Bid-Ask Spreads for Swedish



Data retrieved from Refinitiv and the Riksbank.

Source: Wollert 2020.

Despite the improvement in market conditions, the Riksbank began its corporate bond purchases in September as planned to establish a presence in the market which would allow the Riksbank to scale up purchases in the event conditions deteriorated again, as well as to maintain its credibility by following up on its promise to commence purchases (Wollert 2022). It said that financial markets remained fragile and dependent on central bank support (Riksbank 2020m; Ingves 2021).

By the end of April, at which point the Riksbank had purchased SEK 6.3 billion in commercial paper, ⁷ the central bank reported that the risk premia for investment-grade corporate bonds relative to government bonds had fallen from 2 percentage points at its peak earlier that

⁷ The Riksbank purchased commercial paper with three-month maturity (announced April 2) and six-month maturity (announced May 8). In April, outstanding commercial paper issued in Swedish kronor by non-financial corporations had an average original maturity of almost five months (Riksbank 2020m).

month to 1.6 percentage points. The Riksbank interpreted this as "an indirect indication that the [commercial paper] purchases have had an effect and that the market for commercial paper is functioning more smoothly" (Riksbank 2020h, 8). Yet a Staff Memo dated October 2020 noted that Riksbank-facilitated bank lending had largely replaced commercial paper as a source of funding for nonfinancial companies. Issuance of kronor-denominated commercial paper had not recovered to the same extent as the corporate bond market (Wollert 2020).

Figure 3: Index for Financial Conditions in Sweden

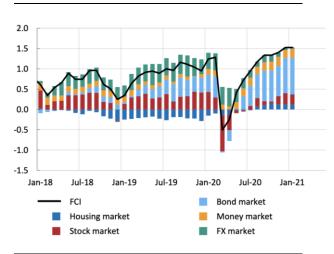
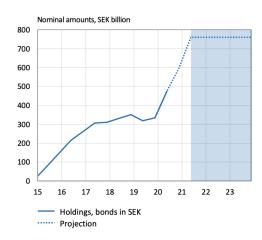


Chart displays standard deviations; a higher value indicates more expansionary financial conditions.

Source: Riksbank 2021a.

Figure 4: The Riksbank's Holdings of Bonds



Forecast assumes entire framework will be used. Shaded area is a projection based on assumption of future decisions on purchases to compensate for maturing bond.

Source: Riksbank 2020m.

Context: Sweden 2019-2020			
GDP (SAAR, nominal GDP in LCU converted to USD)	\$534.30 billion in 2019 \$543.09 billion in 2020		
GDP per capita (SAAR, nominal GDP in LCU converted to USD)	\$51,939 in 2019 \$52,274 in 2020		
Sovereign credit rating	Data for 2019: Moody's: Aaa S&P: AAAu Fitch: AAA		
(five-year senior debt)	Data for 2020: Moody's: Aaa S&P: AAAu Fitch: AAA		
Size of banking system	\$744.12 billion in 2019 \$822.56 billion in 2020		
Size of banking system as a percentage of GDP	139.27% in 2019 151.46% in 2020		
Size of banking system as a percentage of financial system	100% in 2019 100% in 2020		
Five-bank concentration of banking system	77.37% in 2019 77.09% in 2020		
Foreign involvement in banking system	Data not available for 2019 Data not available for 2020		
Government ownership of banking system	Data not available for 2019 Data not available for 2020		
Existence of deposit insurance	Yes in 2019 Yes in 2020		
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Sources: Bloomberg, World Bank Global Financial Development Database, and World Bank Deposit Insurance Dataset.

Key Design Decisions

1. Purpose: The Riksbank initiated corporate bond purchases to maintain the orderly function of financial markets during the COVID-19 pandemic.

The Riksbank purchased corporate bonds to "support credit supply to robust companies and prevent problems arising in financial markets that, in turn, create further problems for companies and households in need of credit." The Riksbank also said it intended to establish a presence on the corporate bond market, "and thereby ensure a good capacity to rapidly extend the scope of the purchases if monetary policy needed to be made more expansionary" (Riksbank 2020l).

The central bank also said that buying corporate bonds would indirectly help smaller companies that didn't have access to the bond market. Banks provide two-thirds of corporate funding in Sweden. Larger companies facing distress at the onset of the pandemic initially sought bank funding, crowding out smaller companies. If the central bank's program would reopen the bond market for larger companies, the central bank said, smaller banks would regain access to banks (Riksbank 2020t; Gustafsson and von Brömsen 2021).

Corporate bond purchases complemented SEK 32 billion in commercial paper purchases (Riksbank 2020e; Riksbank 2020q). In Sweden, the market for corporate bonds is 10 times the size of the market for commercial paper, yet the latter is crucial for smaller companies without credit ratings (Wollert 2020). The two measures to support corporate debt markets were announced jointly at the onset of the pandemic, but corporate bond purchases did not begin until September 2020 (Riksbank 2020e; Riksbank 2020o).

2. Part of a Package: Corporate bond purchases were part of a larger asset-purchase program designed to support market functioning.

The corporate debt purchases were included in a much larger bond-purchasing program first announced on March 16. The broad program was initially set at SEK 300 billion through June 30, 2021, and was ultimately expanded to SEK 700 billion through December 31, 2021 (Riksbank 2020q; Riksbank 2021e; Riksbank 2021f). This program purchased nominal and real government bonds; bonds issued by municipalities and regions and by Kommunivest i Sverige AB, Sweden's local government funding agency; and covered bonds by Swedish institutions (Riksbank 2020l) (see Figure 5).

Figure 5: Riksbank Asset Purchases 2020-2021, Aggregate Holdings (SEK billions)

	2020			2021			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Other Support							
Government Bonds	11.5	23.5	39.5	50.7	62.8	71.0	79.8
Municipal Bonds	11.3	25.3	35.3	49.3	71.2	83.5	90.9
Covered Bonds	90.0	140.0	189.0	238.0	298.0	340.0	380.0
Treasury Bills	-	-	-	3.0	13.5	17.5	17.5
Corporate Support							
Commercial Paper	5.7	1.48	0.9	0.4	0.3	0.3	0.0
Corporate Bonds	-	0.15	1.8	4.4	7.7	10.0	11.6
Corporate lending program*	161.5	164.5	164.5	164.5	31.0	16.0	16.0

^{*} Separate from its asset purchases, the Riksbank initiated a bank lending scheme to support corporate credit (For more information on this lending scheme, see Riksbank 2021c).

Source: Riksbank Monetary Policy Reports, 2020-2021.

On March 12, prior to announcing the corporate bond and commercial paper purchases, the Riksbank said it would offer loans to large banks against collateral totaling SEK 500 billion on particularly favorable terms if they increased lending⁸ to non-financial corporations operating in Sweden (Riksbank 2020h). Because small and medium companies in Sweden are typically customers of smaller, local banks rather than the major banks, the Riksbank also provided temporary access to the program for more counterparties than usual (Gustafsson and von Brömsen 2021).

Other state agencies provided support to businesses negatively affected by the pandemic. On March 26, Almi Företagspartner, a state venture capital program, received a capital injection of SEK 3 billion to increase lending to small and medium-sized businesses whose operations were adversely affected by the pandemic (Gustafsson and von Brömsen 2021; Regeringskansliet 2020). On April 3, the Riksgälden, the Swedish National Debt Office, issued loan guarantees for bank loans extended to affected businesses, up to SEK 75 million per borrower (Riksgälden 2020). On April 11, the European Commission approved SEK 5 billion worth of credit guarantees offered to airlines, including SEK 1.5 billion for Scandinavian Airlines, the flag carrier of Denmark, Sweden, and Norway (EC 2020a; EC 2020b). Beginning in June 2020, Skatteverket, the Swedish tax agency, granted support to companies whose revenue for March and April 2020 was less than 70% of their revenue compared to March

⁸ Bank lending has been the traditional means of funding for corporations in Sweden, as in other EU countries. But in the last decade, low funding costs for corporations and interest from investors searching for yield have combined to make wholesale funding more favorable for companies (Wollert 2020; Riksbank 2020m; Ingves 2021). This is particularly true for Sweden, whose banks have a "deposit deficit" of over SEK 3 trillion, meaning that bank deposits are insufficient to fund bank lending, with the remainder (deficit) covered by wholesale funding (Eidestedt, Forsman, and Ünlü 2020). In July 2020, wholesale funding amounted to a third of total borrowings and roughly a quarter of Swedish GDP (Riksbank 2020m).

and April 2019, and who could prove the decline was due to effects of the pandemic (Skatteverket, n.d.b; n.d.a).

To support the Riksgälden's programs, the Riksbank and Finansinspektionen, the financial supervisory authority responsible for financial regulation in Sweden, reduced the countercyclical capital buffer rate requirement from 2.5 to zero percent on March 13 (FI 2020a). According to Finansinspektionen, the reduction released capital for large and midsize Swedish banks, corresponding to about SEK 900 billion in increased lending potential (FI 2020b; Riksbank 2020u).

3. Legal Authority: Corporate bond purchases were authorized under Chapter 6, Article 5 of the Sveriges Riksbank Act.

Chapter 6 of the Sveriges Riksbank Act contains provisions on the Riksbank's monetary policy operations. Article 5 specifies tools that the Riksbank has at its disposal for monetary policy purposes: to lend against collateral; to purchase, sell, and mediate securities, foreign exchange, and obligations linked to such assets; and to issue its own debt instruments (Andersson and Stenström 2021; Chapter 6, Article 5 of Riksbank, n.d.k). Because Riksbank purchases these securities from its monetary policy counterparties, Government Bill 1986/87:143 requires the Riksbank to ensure its monetary policy measures are competition-neutral; its bid purchases (auctions) and bilateral purchases were designed accordingly (Regeringen 1986).

The Sveriges Riksbank Act was last amended in 1999 (Riksbank 1999). In 2019, the government proposed a revised Sveriges Riksbank Act that, *inter alia*, limits the Riksbank's purchases of non-sovereign assets to extraordinary circumstances, and, according to Riksbank officials, would restrict the range of corporate bonds and other private securities that are eligible for purchase by the Riksbank (Ministry of Finance 2019; Riksbank 2020g). The proposed Sveriges Riksbank Act did not influence the Riksbank's pandemic response measures as it had not yet passed the Riksdag, the national legislature and the supreme decision-making body of Sweden; if passed, the new Act would take effect in 2023 (Riksbank, n.d.i).

In adding sustainability to its eligibility criteria,⁹ the Riksbank relied on Chapter 9 of the Sveriges Riksbank Act, which requires the Executive Board¹⁰ of the Riksbank to ensure that operations are conducted efficiently and in accordance with applicable laws, and that central government funds are managed prudently¹¹ (Andersson and Stenström 2021). The Riksbank

⁹ Since 2019, the Riksbank has performed analysis of its composition of foreign exchange reserves and evaluated how much these assets increase the amount of greenhouse gases, resulting in some assets being sold (Riksbank 2020aa).

¹⁰ The Riksbank is a public authority under the Riksdag. The Riksdag appoints the members of the Riksbank's General Council, and the General Council appoints the members of the Riksbank's Executive Board, as well as supervising the work of the Executive Board (Riksbank, n.d.k).

¹¹ The Riksbank interpreted this to mean that it must manage any risks that arise from a monetary policy measure—including credit risk—which informed the Riksbank's decision to limit purchases to investment grade, among other criteria (Andersson and Stenström 2021). In establishing that "sustainability and climate risks are now classified as sources of financial risk," the Riksbank pointed to the "Taxonomy Regulation"

used these data when purchasing corporate bonds to "avoid certain companies or sectors that are judged to be too risky from a sustainability and climate perspective," thereby "[limiting] the Riksbank's financial risk linked to sustainability" and fulfilling its risk management obligations (Andersson and Stenström 2021, 7–8).

4. Governance: The Executive Board of the Riksbank, the Head of the Monetary Policy Department, and the Head of the Financial Stability Department approved corporate bond purchases while the General Council informed the Riksdag of the Riksbank's activities.

The Executive Board of the Riksbank, the Head of the Monetary Policy Department, and the Head of the Financial Stability Department approved corporate bond purchases (Riksbank 2020z).

The Riksbank is considered a public authority under the Riksdag, Sweden's parliament, which appoints the Riksbank's General Council (Riksdag 2021, Chapter 9, Article 13). The General Council is tasked with, among other things, enabling transparency and control for the Riksdag and keeping the Riksdag's Committee on Finance informed of important matters at the Riksbank (Ingves and Meyersson 2021; Ministry of Finance 2019). The General Council also appoints the six-member Executive Board, including the Governor of the Riksbank, which pursuant to the Instrument of Government manages the activities of the Riksbank (Riksbank 2021, 1–2; Riksdag 2021, Chapter 9, Article 13).

The Riksbank Act states the Riksbank must deliver a monetary policy report twice a year to the Riksdag's Committee on Finance (Riksbank, n.d.k, Chapter 6, Article 4). The Riksbank's monetary policy reports contained details on its purchases of corporate debt (Riksbank 2020m; Riksbank 2020p; Riksbank 2020u). Prior to the Executive Board making a monetary policy decision "of major importance," the Riksbank must inform the Finance Minister (Riksbank, n.d.k, Chapter 6, Article 3).

In 2015, the Riksdag's Committee on Finance criticized how the Riksbank's activities are scrutinized (Ingves and Meyersson 2021; Riksdag 2016). In 2018, the Riksdag established the Riksbank Inquiry to determine how the Riksdag could strengthen scrutiny of the Riksbank and its monetary policy (Ministry of Finance 2019). In 2019, the Riksbank Inquiry, noting the Riksbank's high degree of independence relative to other central banks and Swedish authorities, proposed a new Sveriges Riksbank Act to the Council of Law, which if approved would take effect in 2023 (Ingves and Meyersson 2021, 5).

have these data estimated by a vendor, Sustainalytics (Riksbank 2020z; Andersson and Stenström 2021).

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^(2020/852) adopted by the European Council and the European Parliament in June 2020 and noted that "climate-related risks can give higher costs and lower income, that is, affect companies' future cash flows and thereby their credit ratings" (Andersson and Stenström 2021, 7, 10). Yet, the Riksbank acknowledged that it relies on external assessments to evaluate credit risk, and "it is not certain that sustainability and climate risks are sufficiently incorporated into the rating agencies' assessments" (Andersson and Stenström 2021, 7). So, in addition to ratings-agency assessments, the Riksbank required companies to report carbon emissions data or

5. Administration: The Riksbank administered the bond purchase program and empowered the Head of the Markets Department to conduct asset purchases.

The asset purchases were a monetary policy decision made by the Executive Board (Riksbank 2020o). The Head of the Riksbank's Markets Department (with the right to delegate to another person) determined the amounts of CB purchases and set the terms and conditions for, and information on, participation in the CB purchase program (Riksbank 2020z).

Bilateral bond purchases and bid purchases (auctions) were cleared through Euroclear Sweden. Bids were made by the counterparties via the Bloomberg Bond Auction System (Riksbank 2020x).

In May 2020, given that the market situation remained uncertain, the Riksbank hired BlackRock Financial Markets Advisory to analyze the Swedish corporate bond market and assess possible design options for a potential corporate bond asset purchase program (Riksbank 2020j). The Riksbank did not make this report public.

The Head of the Markets Department was required to consult with the Heads of the Monetary Policy and Financial Stability Departments (with the right for these Heads to delegate to other persons) about the dates and amounts associated with each auction or purchase offer, and terms and conditions for, and information about the bond purchases. The Head of the Markets Department was required to consult with the Executive Board on these elements of the program at least once every other month (Riksbank 2020z). The Executive Board was the final authority on corporate bond purchases (Riksbank, n.d.).

6. Communication: The Riksbank initially intended corporate bond purchases to support credit supply to companies and restore market functioning; later, the Riksbank communicated its intent to establish a presence on the market should conditions deteriorate further.

The Riksbank intended corporate bond purchases to support credit supply to Swedish companies and restore market functioning, which it believed would restore the flow of credit to households. Once bond purchases began, the Riksbank stated its intent to establish a presence on the corporate bond market that would allow it to scale purchases if necessary and maintain expansionary monetary policy (Riksbank 2020l).

In its initial announcement, the Riksbank did not communicate a starting date for corporate bond purchases, instead indicating the purchases would begin sometime during the period of March–December 2020.

7. Disclosure: The Riksbank provided twice-yearly reports to the Riksdag that included details on the program; published aggregated auction results on a biweekly basis; and, beginning in 2021, published sustainability data on a monthly basis.

In announcing the details of its corporate bond purchases in August 2020, the Riksbank said it would periodically provide detailed information on its holdings of corporate bonds after it made purchases (Riksbank 2020o).

When it began its bilateral bond purchases in September 2020, the Riksbank published aggregate purchase data about those purchases on a weekly basis (Riksbank, n.d.l). Although the Riksbank published a list of companies that met its eligibility criteria, transaction-level details on individual bilateral purchases were not announced publicly in accordance with Offentlighetsoch sekretesslag (2009:400), which states that information on the Riksbank's counterparties is classified (Riksdagsförvaltningen 2009, Chapter 31, §1)

Once the Riksbank began bid purchases (auctions) on December 2, 2020, it published results on a bi-weekly basis (Riksbank, n.d.a). Directly after a completed auction, the Riksbank published information on total bid volume, number of bids, allocated volume, and price per bond (Riksbank, n.d.a; Riksdagsförvaltningen 2009 Chapter 31, §1).

On a quarterly basis beginning in January 2021, the Riksbank published the weighted average carbon intensity for its corporate bond holdings (Riksbank, n.d.b). Sustainalytics, an independent firm, calculated carbon intensity on the basis of companies' reported emissions or Sustainalytics' own estimates (Riksbank, n.d.b). The Riksbank also measured and reported on aggregate greenhouse gas emissions in the portfolio of corporate bonds, as well as emissions by industry¹² (Ferlin, Blix, and Brattström 2021).

Beginning February 1, 2021, the Riksbank published once a month, with a one-month lag, information on the volume and price per transaction for all corporate bonds the Riksbank had purchased through both the bilateral purchase procedures and by auctions (Riksbank 2020y; Riksbank, n.d.a; Riksbank, n.d.l). These publications included information on the bond issuer and the transactions details but did not name the counterparty transacting with the Riksbank (Riksbank 2020y; Riksbank, n.d.a; Riksbank, n.d.l).

Pursuant to the Sveriges Riksbank Act, the Riksbank has to submit a written report on monetary policy to the Riksdag Committee on Finance at least twice a year (Chapter 6, Article 4 of Riksbank, n.d.k). This report contained financial and operational details on the bond purchase program as well as commentary on its effects on market functioning. The Riksbank also included program details in its Annual Report submitted to the Riksdag in accordance with Chapter 10, Article 3 of the Sveriges Riksbank Act (Chapter 10, Article 3 of Riksbank,

¹² The carbon footprint for the Riksbank's holdings of corporate bonds, calculated as the weighted average carbon intensity of the portfolio, is 135 tonnes of carbon per USD million of revenue (Ferlin, Blix, and Brattström 2021).

n.d.k). The Report included an administration report, a balance sheet, a profit and loss account, and an assessment of the Riksbank's internal controls, as well as commentary on its pandemic response measures.

The Executive Board of the Riksbank usually holds five monetary policy meetings per year and publishes a Monetary Policy Report after each of these meetings (Riksbank 2021g).

8. Use of SPV: The Riksbank did not utilize a special purpose vehicle to purchase corporate bonds.

The Riksbank did not rely on a special purpose vehicle to purchase corporate bonds, instead purchasing commercial paper at auctions organized with its monetary policy counterparties.

9. Size: The Riksbank set a limit on corporate bond purchases of SEK 10 billion in 2020 but raised that limit to SEK 13 billion in 2021.

In June 2020, the Riksbank said it would limit its corporate bond purchases to SEK 10 billion (Riksbank 2020l). The Riksbank increased the limit to SEK 12 billion in April 2021 and SEK 13 billion on June 30, 2021 (Riksbank 2021e; Riksbank 2021f).

In August 2020, the Riksbank said it intended to "ensure a good capacity to rapidly adjust the scope of the purchases with consideration to their monetary policy impact and other monetary policy assessments going forward" (Riksbank 2020o, 2).

Net holdings (the total sum of bonds purchased minus maturities) topped SEK 11 billion in September 2021. The Riksbank normally held bonds it purchased to maturity (Riksbank, n.d.j; Riksbank 2022). The Riksbank used proceeds from its bond purchases to extinguish reserves.

At its peak in September 2021, the Riksbank owned 1.5% of outstanding corporate bonds on the market (Riksbank 2022). When the corporate bond purchase program began on September 14, 2020, Swedish corporations had SEK 426 billion in outstanding bonds, roughly 70% of which were investment grade and the remainder high yield (Nordic Trustee 2020I).

Bilateral corporate bond purchases peaked at SEK 455 million the week of February 15, 2021; bid purchases (auctions) peaked in June 2021, with the monthly volume offered and purchased reaching SEK 300 million and SEK 122 million, respectively (Riksbank, n.d.l).

10. Source of Funding: The Riksbank funded its corporate bond purchases through the creation of reserves.

The Riksbank purchased a bond on the secondary market and paid the seller, one of its monetary policy counterparties, by crediting the RIX account for the counterparty's bank (Kjellberg and Vestin 2019; Riksbank 2020k). The Riksbank created the money that was deposited in the banks' accounts in the RIX payment system. RIX is the Swedish payment system used by banks and other financial institutions to settle transactions. The bond

holdings were recorded as assets on the Riksbank's balance sheet. As the bond holdings matured, the reserves were extinguished (Kjellberg and Vestin 2019).

The Riksbank said that such interventions "normally have several different, and partly uncertain, consequences for the national economy and the Riksbank's own finances." It said that the "benefits of the respective measures therefore have to be weighed against their potential drawbacks and risks" (Riksbank 2020i, 3). Although purchases of corporate debt have increased the credit risk in Riksbank's asset portfolio, the Riksbank said the risk was limited as these securities only make up a small portion of the assets. The Riksbank normally buffers financial risk with equity and unrealized gains in revaluation accounts, but the total buffer did not grow at the same rate as the Riksbank's financial risks increased. As a result, the Executive Board of the Riksbank made a provision for financial risks, allowing the Riksbank to retain SEK 5 billion in profit on its balance sheet by reducing the dividends paid to the government (Riksbank 2020a).

11. Eligible Institutions: Monetary Policy Counterparties who completed Registration were eligible to make a bid in the Riksbank's bond purchase program.

The Riksbank conducts monetary policy with the assistance of 24 monetary policy counterparties¹³, which are credit institutions either domiciled or with a branch in Sweden and that participate in Sweden's payment system, RIX (Riksbank, n.d.h; Riksbank, n.d.f). Monetary policy counterparties were required to register for each individual monetary policy measure before they could participate. Registration bound the counterparty to the terms and conditions of each measure and included contact details, Euroclear account information, and, for bid purchases, contact information for the counterparty's account in the Bloomberg Bond Auction System (Riksbank 2020x).

12. Auction or Standing Facility: The Riksbank initially purchased bonds over the counter and later organized reverse auctions.

When designing its corporate bond purchase program, the Riksbank considered the "special circumstances" of Sweden's market: its small size, fragmentation, heterogeneity, limited liquidity, and lack of transparency—all of which made it difficult for Riksbank to evaluate corporate bonds (Riksbank 2020o). These factors informed the Executive Board's decision to employ both over-the-counter purchases (which the Riksbank called "bilateral") and bid (auction) purchases. The Riksbank pursued the two purchase methods to maintain flexibility in its choice of bonds (Riksbank 2020p; Riksbank 2020o). Both methods were available only to monetary policy counterparties who registered for the program with the Riksbank (Riksbank 2020x; Riksbank 2020v).

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¹³ Like corporate bond markets in the U.S., EU, and elsewhere, there are no formal market makers in the Swedish corporate debt market like there are in the markets for government and covered bonds. However, unlike those markets, the Swedish market has relatively less liquidity due to fewer, smaller participants and lesser repo and assurance possibilities (Wollert 2020).

The Riksbank announced that its first corporate bond purchases in September 2020 would be made through over-the-counter purchases¹⁴ (Riksbank 2020r; Section D.3 of Riksbank 2020n). Although most of the Riksbank's non-corporate asset purchases were conducted through auctions, over-the-counter purchases are the most common transaction method in Sweden's corporate debt market. The Riksbank used this method first in order "to establish the Riksbank's presence on the market and thereby a good capacity to influence pricing on this market" (Hansson and Birging 2021; Riksbank 2020p). Delivery and payment were expected two days after the purchase date (Riksbank 2020r).

In its announcement of the bond purchase program in September, the Riksbank said it may purchase corporate bonds by a bid (auction) procedure "at a later stage" (Riksbank 2020q). Bid purchases were announced on November 17, 2020, and began on December 2, 2020 (Riksbank 2020y). Bid purchases were determined to be the "most market-neutral way" ¹⁵ of ensuring purchases had a broad impact on interest rates (Riksbank 2020z, 4).

Before each auction, the Riksbank published the specific securities it was offering to buy and the purchase amounts. The Head of the Markets Department determined these lists after consultation with the Heads of the Monetary Policy and Financial Stability Departments (Hansson and Birging 2021). Bids submitted by monetary policy counterparties included information about the desired volume and the interest rate bid for each bond (Riksbank 2020w). When the auction concluded, the bids were ranked according to the offered interest rate. The Riksbank then decided on the final volume¹⁶ and bonds were allocated using the unit price method, whereby all allocated bids received the lowest successful rate¹⁷ (Riksbank 2020w). The counterparty that offered to sell at the highest interest rate (i.e., the lowest price) received its allocation first (Hansson and Birging 2021).

13. Loan or Purchase: The Riksbank purchased investment-grade corporate bonds on the secondary market.

The Riksbank purchased investment grade corporate bonds on the secondary market.

¹⁴ Bilateral transactions are made outside regulated marketplaces; these are also known as "over-the-counter" or OTC-traded. Most of the transactions on the secondary market are made bilaterally between buyer and seller over the telephone or an online chat (Wollert 2020). In a typical bilateral purchase, either the counterparty can be contacted directly by the Riksbank, or the transaction is executed through a market agent (Riksbank 2020n).

¹⁵ To evaluate market neutrality in the Riksbank's purchases, holdings of corporate bonds were regularly compared with a portfolio consisting of all the bonds that the Riksbank had been able to purchase since September 2020 and which had not yet matured (Riksbank, n.d.j).

¹⁶ Volumes were stated as a nominal SEK 1 million, or SEK 2 million in bonds where the smallest denomination is SEK 2 million (Riksbank 2020w). Final volumes fell within the highest and lowest permitted bid volume for each bond (Riksbank 2020w).

¹⁷ The bids with the highest submitted interest rate/credit margin mark-up were allocated first, then the next highest bids for rate/credit margin mark-up, and so on until the final volume was filled (Riksbank 2020w). The lowest accepted rate/credit margin mark-up applied to all bids allocated (Riksbank 2020w).

14. Eligible Assets: The Riksbank purchased non-subordinated corporate bonds issued in Swedish kronor by non-financial companies with investment-grade credit ratings and a remaining maturity of up to five years.

The Riksbank purchased corporate bonds from non-financial corporations for the first time in response to the COVID-19 pandemic.¹⁸ In its definition of "non-financial" corporations, the Riksbank included captive financial institutions and investment companies with a broad ownership diversification (Riksbank, n.d.g). Firms with primarily financial operations, or under the supervision of Finansinspektionen, were excluded from participating in the program (Riksbank, n.d.g).

The Riksbank purchased corporate bonds from investment-grade companies, defined as those with credit ratings of at least BBB-/Baa3 from Standard & Poor's, Moody's, Fitch Ratings, Nordic Credit Rating, or Scope Ratings (see Figure 6). The credit rating of the security was considered first, and if the bond was unrated then the company's credit rating was used (Riksbank 2020o).

Figure 6: Riksbank Corporate Bond Portfolio Ratings Composition

Credit Rating ^A	Amount (SEK million)	Percent of Riksbank's holdings	Average remaining time to maturity (months)
AA ^A	693	7%	23.9
A ^B	4,556	43%	22.9
BBB ^C	5,445	51%	24.4
High Yield	-	-	-
Not rated	-	-	-

^A Ratings by S&P, Fitch, Moody's, Nordic Credit Rating, and Scope.

 $^{C}A+/A/A-, A1/A2/A3$

Data retrieved from Riksbank, Bloomberg as of Aug. 2, 2021.

Source: Riksbank, n.d.e; Riksbank, n.d.j; Wollert 2020.

The Riksbank sought a portfolio of corporate bonds that was representative of the outstanding volume eligible for purchase. As of September 2021, 58 companies were eligible under the Riksbank's criteria (Riksbank, n.d.g). In the event a security or company no longer

 $^{^{}B}$ AA+/AA/AA-

D BBB+/BBB/BBB-, Baa1/Baa2/Baa3

¹⁸ The Riksbank considered purchasing corporate bonds, among other asset classes, in its response to the Global Financial Crisis (Riksbank 2020d).

met the criteria, the Riksbank immediately excluded further purchases of these bonds, but it did not normally sell bonds (Riksbank, n.d.g).

On the date of purchase, eligible bonds must have been issued at least 30 days prior to the purchase date¹⁹, and on that date could not have a time to maturity of less than six months or more than five years (Riksbank, n.d.g).

Most corporate bonds in Sweden are issued senior unsecured. Corporate bonds are issued by Swedish companies in kronor (SEK 553 billion) and other currencies, including euros, US dollars, Norwegian krone, and pounds sterling (totaling SEK 655 billion); the Riksbank only purchased bonds issued in kronor²⁰ (Wollert 2020).

In January 2021, after "developing methods to identify risks linked to sustainability that can affect the conditions for the Riksbank's execution of its tasks," the Riksbank began requiring companies to comply with international standards and norms for sustainability in order to be eligible for bond purchases (Riksbank 2021d). The Riksbank employed Sustainalytics, a provider of sustainability analysis data, to perform a norms-based negative screening of the companies whose bonds were included in the Riksbank's portfolio (Riksbank 2021d). Once the carbon footprint of each company was measured, bond purchases were limited to those companies found to be compliant. If the Riksbank had previously purchased bonds from a company found to be noncompliant, the Riksbank could sell the bonds and these bonds would be ineligible for future purchases (Andersson and Stenström 2021). (See Key Design Decision 21 for more details on sustainability criteria.)

15. Purchase Price: Bilateral purchase prices were negotiated with the seller; bid purchase prices were determined in competitive auction; no haircuts were applied.

In the bilateral purchase procedure, the relevant securities, volumes, and prices were negotiated for each transaction between the Riksbank and the monetary policy counterparty. In these negotiations, the Riksbank would reference offered prices and dealer inventories to determine a fair price for a given bond. In the bid purchase procedure, the auction involved monetary policy counterparties competing against one another in bidding with regard to the price and volume at which they were prepared to sell a particular bond (Riksbank n.d.c). (See Key Design Decision 12 for more detail on bid purchase procedures.)

16. Haircuts: This Key Design Decision is not applicable to asset purchase programs.

This Key Design Decision is not applicable to asset purchase programs.

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¹⁹ To ensure bonds were not obtained from the issuer "solely to fulfill the delivery to the Riksbank," the Riksbank stipulated that "delivery may not consist of bonds where the counterparty has purchased the bond from the issuer later than thirty days prior the purchase date" (Riksbank 2020r).

²⁰ Ownership of corporate bonds issued in Swedish kronor is spread across mutual funds (30 percent), insurance and pension funds (20 per cent), and foreign investors (30 percent). Foreign investors hold the overwhelming majority of Swedish corporate bonds issued in foreign currencies (Riksbank 2020m).

17. Interest Rates: The Riksbank did not charge an interest rate for purchases of corporate bonds.

As an asset purchase program, there was no interest rate associated with the Riksbank's corporate bond purchases.

18. Fees: The Riksbank charged normal RIX participant fees.

All RIX participants paid fees to the Riksbank according to a price list published by the Riksbank (Riksbank 2020n; Riksbank 2021b). RIX is Sweden's real-time gross settlement payments system. Fees were based on the principles of limitation of systemic risks, cost coverage, and non-discrimination (Riksbank 2020n).

Additionally, monetary policy counterparties were expected to hold a sufficient amount of securities or currency to carry out a transaction. Any counterparties unable to deliver or pay for their securities were charged interest on the part of the delivery or payment that had not been executed, at a rate equal to the current reference rate as defined in Section 9 of the Interest Act (9 § Räntelagen) plus 8 percentage points. This interest would be charged for the term equal to the intended transaction (Riksbank 2020n).

19. Term: This Key Design Decision does not apply to asset purchase programs.

This Key Design Decision does not apply to asset purchase programs.

20. Other Restrictions on Eligible Participants: The Riksbank held no more than 50 percent of an individual issuer's total outstanding bonds, and no more than 50 percent of an individual bond issuance.

The Riksbank limited its holdings of corporate bonds to no more than 50 percent of an individual company's total outstanding volume of corporate bonds in Swedish kronor and no more than 50 percent of an individual bond issuance²¹. These limits were applied to ensure the bonds purchased "proportionately reflect the total volume of securities covered," and thus affect the market in "a broad and market-neutral manner and thereby having the desired monetary policy impact" (Riksbank 2020o).

21. Other Restrictions on Eligible Participants: Beginning in January 2021, the Riksbank applied a norms-based negative screening to measure the carbon footprint of companies otherwise eligible for its bond purchases.

On December 16, 2020, the Riksbank announced it would measure and report the carbon footprint of its corporate bond portfolio and, beginning in January 2021, only purchase assets from companies that complied with international standards and norms for

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²¹ For commercial paper purchases, the limit was 70 percent per issuer.

sustainability²² (Riksbank 2020; Riksbank 2020z). The negative screening was intended to help Riksbank "manage government funds prudently" by "[reducing] the financial risks that could follow from climate change or from companies failing to comply with international standards and norms" as well as "safeguarding long-term sustainable economic development" (Riksbank 2020aa, 4). The Riksbank was also motivated by adhering to "the state's core values" and reputational concerns (Andersson and Stenström 2021, 8).

The Riksbank employed negative screening, or the exclusion of companies on the basis of certain criteria. The basis of the Riksbank's negative screening were the principles included in the UN Global Compact, the OECD Guidelines for Multinational Enterprises, and the UN Guiding Principles on Business and Human Rights, which together included standards in the areas of human rights, labor conditions, environment, and anti-corruption (Andersson and Stenström 2021).

Recognizing that there is no standardized method for measuring sustainability and climate-related risks, and that information on companies' climate-related risks was "insufficient, incomplete and inconsistent," the Riksbank sought to assist companies lacking the capacity to self-report by employing a vendor, Sustainalytics, to estimate these data for companies²³ (Andersson and Stenström 2021; Riksbank 2021d). Once the external assessment was completed, the Riksbank would "make its own assessments based on the analyses produced" (Andersson and Stenström 2021, 9).

In selecting bonds according to their sustainability assessment, the Riksbank had the "aim of avoiding distorting effects on the Swedish market for these securities" (Riksbank, n.d.g). If a company whose bonds the Riksbank had already purchased were to be assessed as in breach of the norms in the future, the Riksbank would "take a stance on how to handle this taking into account the customary monetary policy considerations," potentially "refraining from making further purchases, or selling the bonds purchased earlier" (Andersson and Stenström 2021, 9).

In addition to adding sustainability to its eligibility criteria, the Riksbank also reported the aggregate carbon footprint of its bond holdings (Riksbank, n.d.b; Ferlin, Blix, and Brattström 2021).

22. Regulatory Relief: The Riksbank did not offer its monetary policy counterparties regulatory relief for participation in its corporate bond purchases.

The Riksbank did not offer regulatory relief to participants in its corporate bond purchase program.

²² The Riksbank also announced purchases of Swedish sovereign and municipal "green bonds;" however, regarding its corporate bonds, the Riksbank placed "no particular importance on whether or not the assets are classified as green" (Riksbank 2020aa, 5).

²³ Only 40 percent of Swedish companies otherwise eligible for corporate bond purchases reported greenhouse gas emissions, meaning more than half of the portfolio's total carbon footprint was estimated (Ferlin, Blix, and Brattström 2021, 18).

23. International Coordination: The Riksbank did not coordinate with other countries for its corporate bond purchases.

While central banks in other countries purchased corporate bonds over the same period, the Riksbank's program was not coordinated with these efforts, and its approach was specifically tailored to the distinguishing features of Sweden's corporate bond market.

24. Duration: Initially scheduled to end December 2020, the corporate bond purchase program was extended to December 31, 2021.

The Riksbank originally announced bond purchases up to SEK 300 billion through December 2020 (Riksbank 2020e). On June 30, 2020, bond buying was extended to June 30, 2021, and the limit increased to SEK 500 billion including the SEK 300 billion previously announced. In this June 30, 2020, announcement, the Riksbank communicated its intent to purchase up to SEK 10 billion in non-financial corporate bonds between September 1, 2020, and June 30, 2021 (Riksbank 2020l). On August 31, 2020, the Riksbank confirmed that bilateral corporate bond purchases would begin on September 14, 2020 (Riksbank 2020o). Then, on November 25, 2020, the Riksbank extended the bond buying program, including the purchase of corporate bonds, to December 31, 2021, and up to a total amount of SEK 700 billion, inclusive of prior purchases (Riksbank 2020l). In April 2021 and June 2021, the limits on corporate bond purchases were raised by a SEK 2 billion and SEK 1 billion, respectively, capping the program at SEK 13 billion until its expiration on December 31, 2021 (Riksbank 2020q; Riksbank 2021e; Riksbank 2021f). In November 2021, the Riksbank announced it would replace maturing bonds in order to maintain its net holdings, a practice it would review each quarter (Riksbank 2021h).

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