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## The European Central Bank's Three-Year Long-Term Refinancing Operations (ECB GFC)

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# European Central Bank: Three-Year Long-Term Refinancing Operations<sup>1</sup>

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Yale Program on Financial Stability Case Study  
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## Abstract

The announcement of the three-year Long-Term Refinancing Operations (LTROs) by the European Central Bank (ECB) on December 8, 2011, signaled the beginning of the largest ECB market liquidity programs to date. Continued and increasing liquidity-related pressures in the form of ballooning financial market credit default swap (CDS) spreads, Euro-area volatility, and interbank lending rates prompted a much more forceful ECB response than what had been done previously. The LTROs, using a repurchase (repo) agreement auction mechanism, allowed any Eurozone financial institution to tap essentially unlimited funding at a fixed rate of just 1%. Because the three-year LTROs were so similar to their shorter-maturity counterparts, the types of eligible collateral were almost identical, though the three-year operations were slightly less strict with the types of asset-backed securities (ABS), loans, and debts that could be pledged. The first operation, conducted on December 22, 2011, saw 523 banks draw €489.2 billion in funding, and the second operation, finalized on February 29, 2012, saw 800 banks draw €529.5 billion. Much of the liquidity, rather than being put into private credit markets, was placed at the ECB deposit facility to supplement the interbank lending market. Banks that were more vulnerable to a credit crunch, often located in peripheral countries such as Spain and Italy, tended to use the facility more and also drove the increase in the supply of private credit. Less at-risk institutions tended to engage in “reach-for-yield” strategies with debt from riskier sovereigns. Post-crisis evaluations were mixed, but analysts tend to agree that the facilities helped ease the initial shock in the Euro-area money market and reduce the impact of the credit crunch on the broader economy.

**Keywords:** European Central Bank, ECB, Long-Term Refinancing Operations, LTRO, market liquidity programs, market liquidity, wholesale funding, credit markets, repurchase agreements, repos

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<sup>1</sup> This case study is part of the Yale Program on Financial Stability (YPFS) selection of New Bagehot Project modules considering the responses to the global financial crisis that pertain to market liquidity programs.

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# ECB Three-Year Long-Term Refinancing Operations

## At a Glance

Despite the acute pressures of the Global Financial Crisis having passed, conditions in European interbank lending and money markets continued to deteriorate through 2011. This was apparent in ballooning financial market CDS spreads, interbank lending rates, and money market volatility. Increasing liquidity pressures prompted the European Central Bank (ECB) to respond more forcefully, with the announcement of two three-year Long-Term Refinancing Operations (LTROs) on December 8, 2011. Previously, the ECB had conducted LTROs and other refinancing operations to support monetary policy goals and address liquidity pressures. But the earlier LTROs had maturity horizons of no more than one year.

The three-year LTROs were conducted via an auction mechanism. These auctions allowed European financial institutions to bid for funding in the form of repurchase (repo) agreements, with the ECB as the counterparty. European financial institutions with eligible collateral could bid on essentially unlimited amounts of funding, as the ECB did not specify a hard cap. The repos were auctioned at a fixed rate of 1%.

Eligible collateral was expanded from previous operations to include asset-backed securities (ABS) with a second-best rating of at least “single-A” at issuance that would continue to hold that rating; assets made up of loans to small and medium-sized enterprises (SMEs); and government-guaranteed liabilities. Banks that participated in the ECB’s earlier one-year LTRO in October 2011 were also given an option to lengthen the maturity of repo agreements obtained there to three years on December 22, 2011, the day of the first auction. The first operation saw 523 banks draw €489.2 billion in funding, and the second operation, finalized on February 29, 2012, saw 800 banks draw €529.5 billion for a grand total of approximately €1.02 trillion.

## Summary Evaluation

The three-year LTRO program was the ECB’s largest market liquidity program ever. It received mixed reviews. The ECB argued that the program had eased strains in European money markets and helped to prevent a Euro-wide credit crunch. Lenders who were most vulnerable to the credit crunch, often in peripheral countries like Italy and Spain, tended to use the facility more and were the main drivers of private credit growth. While credit growth contracted, one analysis concluded that it would have contracted more if the LTROs had not been in place. Many lenders, particularly those that were less vulnerable, opted to use the cheap financing to invest in high-yield government bonds. Conversely, much of the funding was deposited at the ECB deposit facility, suggesting that the ECB became a large substitute in the interbank lending market.

Summary of Key Terms	
Purpose:	To address intense liquidity-related pressures in Euro-area money markets to avoid a credit crunch.
Announcement Date	December 8, 2011
Operational Date	1st: December 22, 2011 2nd: February 29, 2012
Date of First Issuance	1st: December 22, 2011 2nd: March 1, 2012
Final Repayment Date	1st: January 29, 2015 2nd: February 26, 2015
Program Size	Unlimited; unspecified
Usage	1st: €489.2 billion by 523 banks. 2nd: €529.5 billion by 800 banks.
Outcomes	Approximately €1.02 trillion drawn on by at least 800 banks.

# I. Overview

## Background

Despite numerous conventional and unconventional interventions by the European Central Bank (ECB) and various national governments to alleviate stresses brought on by the Global Financial Crisis, the Eurozone was still in a shaky position at the start of 2011. A blooming sovereign debt crisis, catalyzed by the downgrading of Greek debt by ratings agencies and upward revisions by the Greek government to their total indebtedness, sent European markets back into turmoil.

Financial institutions became more and more liquidity constrained as conditions worsened. European money markets chilled, with liquidity concerns morphing into solvency ones as financing became more expensive. EURIBOR-OIS spreads rose to over 100 basis points in July 2011. Volatility also rose sharply. Despite being a few years removed from the Global Financial Crisis, credit default swap (CDS) spreads for financial institutions rose to over 350 basis points in mid-2011, almost 200 basis points higher than spreads of nonfinancial institutions (ECB Monthly Bulletin, March 2012).

Several countries on the Eurozone periphery found themselves in increasingly precarious financial positions. Sovereign CDS spreads and sovereign debt yields for Italy and Spain rose precipitously, indicating that investors were wary about sovereign debt.

## Program Description

To remedy these conditions, the ECB announced on December 8, 2011, that it would conduct two three-year Long-Term Refinancing Operations (LTROs) in December 2011 and February 2012. Previously, the ECB had conducted Long-Term Refinancing Operations (LTROs) and Main Refinancing Operations (MROs) that had maturities of up to one year. This announcement marked the first time the ECB would issue such long-term funding. This decision was unprecedented, though not surprising given the conditions of European financial markets at the time.

The actual mechanism for conducting these operations was through repurchase (repo) auctions held by the ECB. Repo agreements, which are just forms of collateralized lending for normally short terms, were how the ECB conducted earlier LTROs and MROs. Financial institutions with eligible collateral could bid and, in effect, purchase ECB funding at a rate comparable to, or often much cheaper than, rates in private markets. These institutions could then use the new financing to lend to nonfinancial firms that were also experiencing the effects of a credit crunch and thus alleviate those liquidity-related pressures. In the case of the Eurozone, the money obtained via the LTROs could also be used to buy sovereign debt of peripheral countries like Italy and Spain, some of which was trading several hundred basis points higher than that of core countries. These governments, which were experiencing extreme difficulty in selling their sovereign debt, were thus able to indirectly access ECB funding while simultaneously allowing banks to get rid of toxic assets on their balance sheets. The primary objective of the program, therefore, was to improve short-term financing conditions for European financial institutions so that the effects of a continent-wide credit crunch wouldn't be felt by the real economy.

For the two three-year LTROs, auctions were held on December 22, 2011, and February 29, 2012, with maturity dates of January 29, 2015, and February 26, 2015, respectively. The

funding obtained at these auctions could be repaid early after one year either in full or by the week. The ECB also permitted any banks that were counterparties to earlier one-year LTROs that were settled in October 2011 to extend their maturity to three years, so long as they notified their respective national central banks (NCBs) by December 19, 2011. In total, €45.7 billion of €56.9 billion, or just over 80%, was converted this way (ECB Monthly Bulletin, March 2012).

Financial institutions could bid on as much long-term funding as they felt they needed, provided they had the appropriate collateral. Additionally, the rates paid for the funding, at just 1%, were much lower than what private markets were offering. This was primarily true for banks on the Eurozone periphery, which were seen as less creditworthy than their Eurozone core counterparts. Thus, banks in the periphery could lock in unlimited amounts of low-cost, long-term funding while cleaning up their balance sheet.

Despite structuring the three-year LTROs similarly to its previous LTROs, the ECB added several additional stipulations to expand the range of eligible collateral, incorporating loans to SMEs and additional mortgage-related assets ("ECB announces measures to support bank lending and money market activity" 2011). In the case of asset-backed securities, only the most senior tranches were eligible ("FAQs on the measures to support bank lending and money market activity" 2011).

Finally, government-guaranteed debt was also eligible, which, in some cases, made banks self-select into government guarantee programs.<sup>3</sup> This gave institutions the option to use this guaranteed debt as collateral in the LTROs to obtain low-rate ECB financing, which they would then invest in higher-yield government debt, usually from peripheral countries.

## Outcomes

When the last auction settled at the end of February 2012, over €1 trillion in repo agreements had been issued, making the three-year LTROs the largest Eurosystem market liquidity programs ever. The first LTRO, settled on December 21, 2011, was widely seen as more important for severely liquidity-restrained institutions and totaled €489.2 billion for 523 banks. The second, which settled on February 29, 2012, and had a much wider participation, totaled €529.5 billion for 800 banks. Liquidity appeared to return following the announcement and settlement of both operations. CDS spreads, particularly financial CDS, declined nearly 150 basis points from their 350 basis point peak. Interbank lending rates and Eurosystem money market volatility also fell (ECB Monthly Bulletin, March 2012).

As mentioned earlier, banks in Italy and Spain were particularly vulnerable in 2011. They accounted for approximately two-thirds of the total amount issued under the three-year LTRO (Carpinelli and Crosignani 2017). Overall LTRO activity peaked while the three-year LTRO was in place, nearly doubling from its previous peak of about €896 billion during the Global Financial Crisis.<sup>4</sup> Additionally, the balance sheet of the ECB grew significantly, rising almost to the size of the Fed's and the Bank of England's by 2012 (Pisani-Ferry and Wolff 2012). The driving force behind this expansion was the huge increase in repo transactions conducted by the ECB during both the Global Financial Crisis and the sovereign debt crisis.

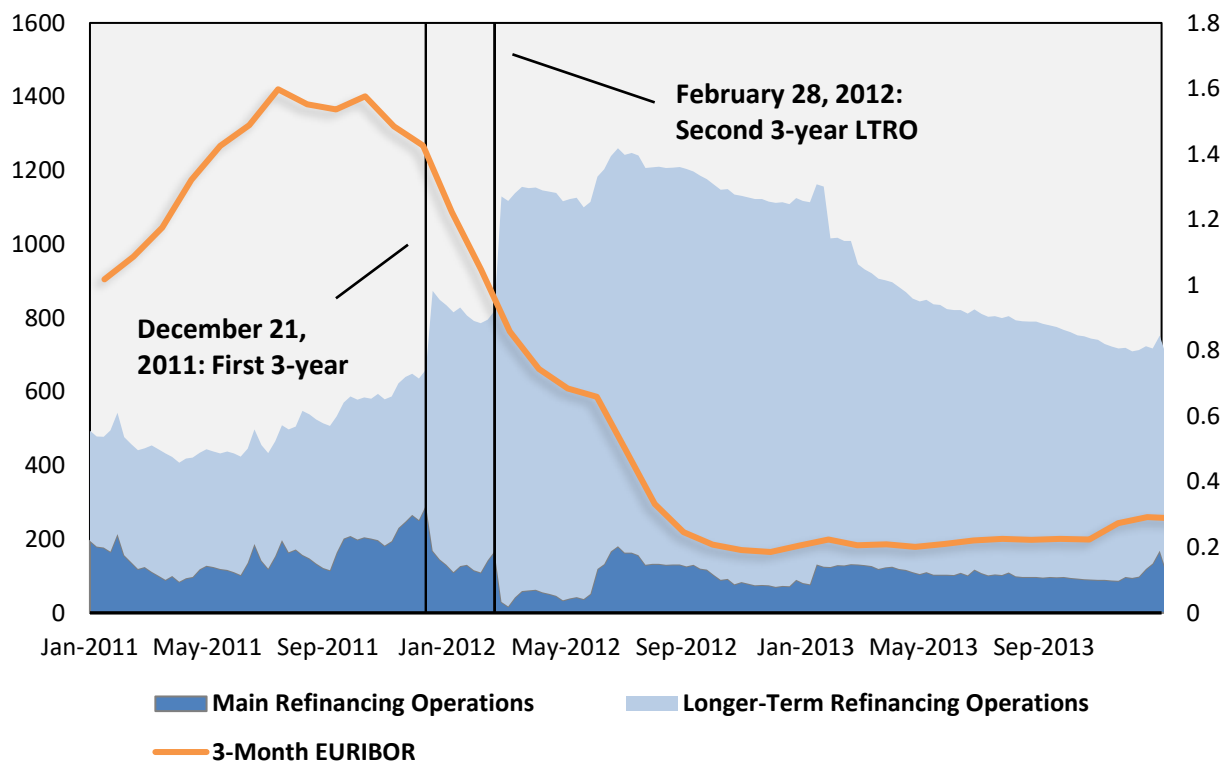
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<sup>3</sup> See Evaluation section for further discussion.

<sup>4</sup> This was as of the week of June 19, 2009.

From February 2007 to February 2012, 64% of the growth in the ECB's balance sheet came from an increase in repo agreements. (See Figure 1)

Figure 1: Volume of ECB Refinancing Operations (€ billions, left axis) and three-month EURIBOR rate (monthly, right axis)



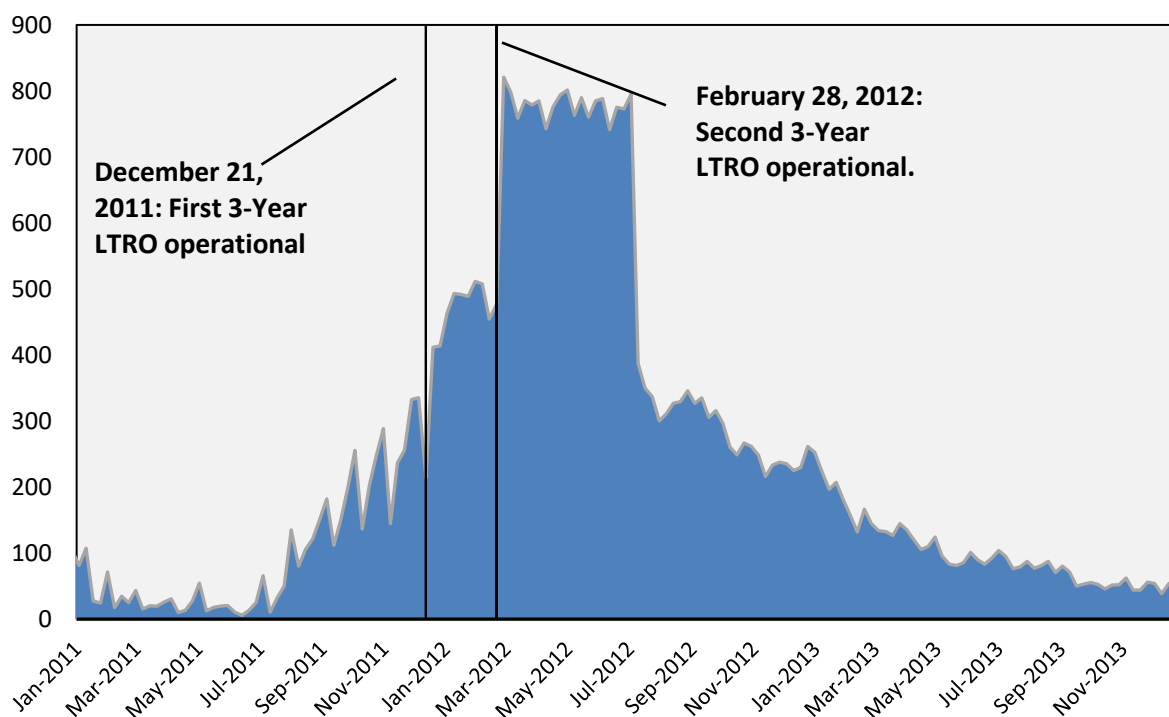
Source: ECB Statistical Data Warehouse

Banks in southern Europe made up 70% of medium- and long-term refinancing operations (Pisani-Ferry and Wolff 2012). Core Eurozone countries also were much more likely to repay any three-year LTRO funding early, with German banks reducing LTRO funding reliance by 80% from 2012 to 2013. In contrast, Italian banks repaid only 20% of funds and Spanish banks 45% by 2013 (Daetz et al. 2018). Many banks that used the program also opted to place much of the liquidity at the ECB deposit facility, although it paid interest of only 25 basis points, compared with the 100 basis point fee that financial institutions paid at the auctions. The amount outstanding in the deposit facility nearly doubled following the two operations. After the first three-year LTRO on December 2011, the amount outstanding shot up to €411.8 billion from €214.1 billion, a 92% increase. The second three-year LTRO yielded an ever larger amount of euros outstanding in the facility: from €477.3 billion to €820.8 billion, an increase of 72% and the highest recorded during the crisis.<sup>5</sup> (See Figure 2.) While the portion of these funds that came from the three-year LTROs is unknown, the

<sup>5</sup> Deposit facility funds during this period peaked on February 27, 2012, at just over €820 billion.

dramatic increases following the allotments certainly suggests that some European financial institutions opted to place their money in the deposit facility. The deposits held at the ECB would hover at over €700 billion until July 2012, when the ECB lowered the deposit facility rate to 0% (“Key ECB interest rates”) (See Figure 3).

Figure 2: ECB Deposit Facility Amount Outstanding (weekly, € billions)



Source: ECB Statistical Data Warehouse

Early repayment was a key feature of these operations, as it meant that the pair of three-year LTROs were effectively two one-year LTROs with an up to three-year maturity extension option. Participants were eligible to return funds from the first and second LTROs on January 25, 2013, and February 22, 2013, respectively. From January 25, 2013, to June 27, 2013, approximately €205.8 billion and €101.7 billion were repaid from the first and second LTROs, respectively (ECB Monthly Bulletin, July 2013). This suggested that the adverse pressure felt by many European financial institutions at the onset of the programs had lessened dramatically. However, other factors, such as a general return to more “stable” sources of funding, widespread balance sheet adjustments, and signaling effects, also have played roles in the amounts repaid (ECB Monthly Bulletin, February 2013).

Following the operations, there was a dramatic increase in excess liquidity in the system, rising from €258.1 billion to €775.6 billion between the maintenance periods of November 2011 and March 2012 (ECB Monthly Bulletin, July 2013). Initially, European banks repaid their funds faster than markets anticipated, and expected Euro Overnight Index Average (EONIA) rates rose, indicating that markets believed that reliance on LTRO funding would

taper off quicker than expected. However, early repayment amounts quickly flattened and became relatively steady following the large initial burst of early repayments. As a result, short-term money market rates tended to stay just above the deposit rate.

## II. Key Design Decisions

### 1. The three-year Long-Term Refinancing Operations were designed to provide liquidity to European financial institutions to lend on private wholesale funding markets during a period of persistent and growing market tension.

The financing itself took the form of longer-term repo agreements, with maturities of three years. Not unlike other, more standard refinancing operations, the ECB conducted an auction for each of the two LTROs in which financial institutions could pledge collateral in exchange for long-term, wholesale funding.

### 2. Legal authority for the operations came from Article 18.1 of the ESCB Treaty.

Article 18.1 specifically gives the ECB the authority to engage in repo agreements, which were the types of funding used for the three-year LTROs (“Institutional Provisions”). The article specifically states that “. . . the ECB and the national central banks may:

(i) operate in the financial markets by buying and selling outright (spot and forward) or under repurchase agreement and by lending or borrowing claims and marketable instruments, whether in euro or other currencies, as well as precious metals;

(ii) conduct credit operations with credit institutions and other market participants, with lending being based on adequate collateral.”

### 3. The program was administered by the respective national central banks (NCBs) that each participating financial institution was located in.

In order to perform an early repayment, lenders had to (i) notify their respective National Central Bank (NCB) at least one week in advance with the intent to repay early and (ii) repay on the next settlement day of any of the ECB’s regularly scheduled Main Refinancing Operations (MROs).

NCBs also had some discretion when it came to eligibility of collateral and could accept “additional performing credit claims that satisfy specific eligibility criteria,” provided that they take responsibility for, or bear the risk for, credit claims that are accepted this way.

### 4. The ECB did not place an explicit cap on the amount of funding auctioned.

At the conclusion of the second auction, the total amount of three-year LTROs outstanding was over €1 trillion. The first LTRO had €489.2 billion auctioned to 523 banks, and the



second had €529.5 billion auctioned to 800 banks. A number of sources specifically cite the potential level of funding as unlimited.<sup>6</sup>

#### **5. All Euro-area banks were eligible to participate in the program.**

The first and second LTROs had participation from 523 and 800 banks, respectively, from 19 different countries. Additionally, institutions in the southern periphery of the Eurozone had considerably more activity, accounting for over 70% of medium- to long-term refinancing operation funding as the crisis intensified (Pisani-Ferry and Wolff 2012). Specifically, banks in Spain and Italy were very active, accounting for approximately two-thirds of the total amount issued (Carpinelli and Crosignani 2017).

#### **6. Sovereign debt, government-guaranteed securities, and senior ABS tranches were eligible, with some caveats.**

All of the usual collateral accepted in normal refinancing operations was eligible. Additional securities were also included, such as:

- (i) “ABS having a second-best rating of at least ‘single-A’ in the Eurosystem’s harmonized credit scale at issuance, at all times subsequently.”
- (ii) “The underlying assets of which comprise residential mortgages and loans to SMEs.”
- (iii) Government-guaranteed debt.

In addition to the eligibility criteria listed above, the ECB required the following:

- (i) All cash-flow-generating assets used as collateral had to be of the same class.
- (ii) Nonperforming, structured, syndicated, or leveraged loans were ineligible.
- (iii) Any institution that was a counterparty or a “close third-party” to ABS used as collateral could not act as interest rate swap providers.
- (iv) All documentation was required to have servicing continuity provisions.

#### **7. The LTROs had three-year terms, with an option of early repayment after one year.**

This was the first time that three-year LTROs had been issued. Prior to these, only LTROs with terms of one year or less had been issued. The new agreements could also be repaid early after one year as well, either all at once or on a weekly basis, so long as the early repayment day was the same as the settlement day for an MRO (ECB Monthly Bulletin, February 2013). Participating institutions only had to give their respective NCB one week’s notice of their intent to repay prematurely. Additionally, the ECB allowed banks that had

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<sup>6</sup> See Carpinelli and Crosignani 2017; Andrade et al. 2017; Daetz et al. 2018.

tapped financing from the one-year LTRO in October 2011 to refinance these operations into three-year LTROs as part of the first allotment in December.

**8. There does not appear to have been a cap on banks' participation, and there were no minimum amounts required.**

European financial institutions access as much funding as they wanted, so long as they had enough eligible collateral. The ECB did not specify a hard cap or a floor on the amount of funding that institutions could access under the program.

**9. The rates for the LTRO auctions were a flat 1%.**

This rate was the average of the ECB's main refinancing operations (MROs) over the course of the operation, which were variable rate. At the time of the auction, ECB repo rates were 1%. EONIA swaps, which were a proxy for future MRO rate levels, indicated that they would likely stay low (Andrade et al. 2017).

**10. Two auctions were held for the two operations: the first on December 22, 2011, and the second on February 29, 2012.**

Both auctions, however, were announced on December 8, 2011. The ECB continued to conduct its weekly auctions for main refinancing operations (MROs) and shorter-term LOTRs for three-month, six-month, and one-year maturities. These operations did not cease despite adverse market conditions.

### **III. Evaluation**

Because of the massive size of the program, the three-year LTROs have been quite heavily scrutinized by academics, journalists, and politicians alike. Generally speaking, institutions that were most acutely distressed during the sovereign debt crisis tended to use the facilities the most. The ECB stated that banks that were more risky tended to bid more at the LTROs, and that even if private markets were able to provide some funding to banks, there was still a heavy incentive to borrow from the facility. However, they stated that "by improving funding conditions, the ECB may have prevented the disorderly shedding of assets, which would have placed certain financial market sectors under pressure" as well as emphasizing a belief that the introduction of these programs contained spillover effects to larger markets (ECB Monthly Bulletin, March 2012).

This rationale was very clear because, while there was not significant growth in private credit or bank lending relative to the size of the program, it was effective in halting the freefall and ultimately stabilizing these two channels. Additionally, spillover effects from the financial sector to the real economy, which was one of the ECB's chief concerns when designing the program, appeared to have been significantly lessened owing to the increase in system-wide liquidity.

One study by the National Bank of Belgium estimated that Euro-area output and inflation were significantly impacted and would have been more than 1% lower without the operations (Boeckx et al. 2017). Demand for sovereign debt was also positively impacted,

despite not being a primary objective of the program. In Spain, Italy, and Ireland, sovereign debt yields decreased around the time of the announcement, with the largest decrease being 51 basis points for Spanish two-year bonds (Krishnamurthy et al. 2017).

Despite the seemingly robust impact on sovereign debt markets and macroeconomic aggregates, the results were mixed for bank lending, which was the primary area the ECB was trying to affect. In a paper published in November 2018, Stine Louise Daetz and her coauthors emphasized that, while these programs appeared to have halted the decline in corporate investment, there was no significant increase in lending either. Distressed lenders did not lend more heavily. However, companies that were able to obtain new loans from lenders who received LTRO financing increased their investment. Finally, the authors provided an interesting counterfactual analysis, explaining that non-Eurozone companies that did not have direct access to LTRO financing decreased their investment more than those in the Eurozone (Daetz et al. 2018).

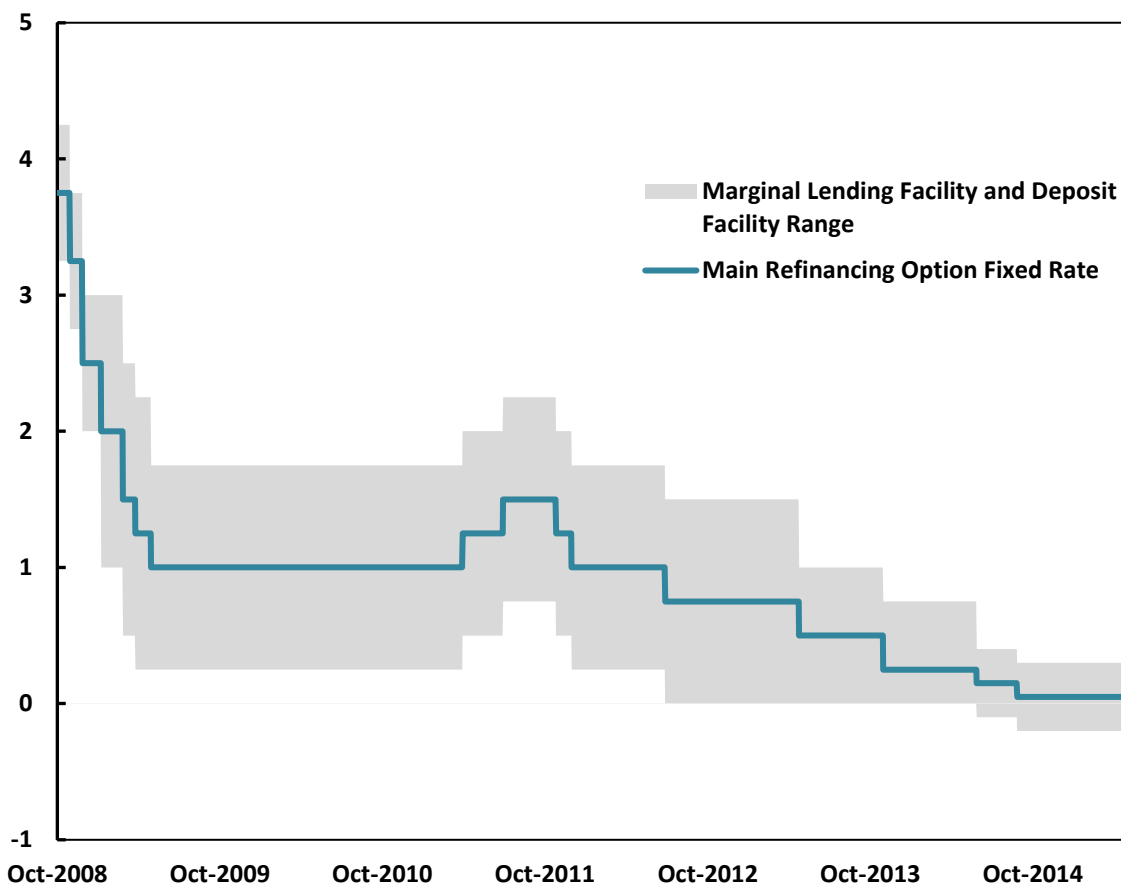
Some analysts argued that the LTROs did not adequately address their primary goals. Italian and Spanish bond yields, while positively impacted by the first round of three-year LTROs, still continued to increase in the later parts of 2012. Spain specifically saw a precipitous increase in its 10-year bond yield, from 5% to 7.6% from March 2012 to July 2012 (Sia Partners 2012). The deteriorating quality of some sovereign debt was also an issue both at the ECB and in periphery banks, which had bought the debt in bulk. For the ECB, a default by any of these periphery countries, however unlikely, would seriously damage the quality of some of the assets on the ECB's balance sheet. For periphery banks, Sia Partners used Fitch downgrading Santander and BBVA to BBB+ shortly after doing the same to Spain's credit rating a week prior as an example, suggesting that many of these banks were now tightly tied to their sovereigns. *The Economist* echoed similar sentiment, arguing that the austerity measures that Spain had instituted were actually harming its return to economic growth, and that the acute phase of the crisis was still quite close ("Draghi strikes back II").

One evaluation written by Jean Pisani-Ferry and Guntram Wolff called these operations the Eurozone equivalent of QE, but that it did not have the same impact as its sister program. This was predicated on the fact that approximately €700 billion was put into the ECB deposit facility rather than lent out, suggesting that the ECB had become a large substitute in the interbank lending market.<sup>7</sup> Additionally, the authors mentioned significant asymmetry in the behavior of banks in the northern part of the Eurozone versus the southern part, explaining that southern European banks are much more heavily reliant on refinancing operations and still have decreased the amount of lending done, contrary to institutions in northern Europe. This asymmetry also extended to the behavior of highly-rated (AAA) issuers, which saw a minimal impact on the yield curve, compared to financially constrained issuers. The authors finished by discussing that the lack of a banking and fiscal union and substantial differences amongst Euro members contributed to massive monetary policy instruments like the LTROs not being as effective (Pisani-Ferry and Wolff 2012).

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<sup>7</sup> See Figure 2 for more information.

Figure 3: Key ECB Interest Rates (%)



Source: ECB Statistical Data Warehouse

In an analysis of the French banking sector, the Bank of France explained that most of the monetary policy transmission that one would expect from such a substantial operation happened after the first LTRO auction in December. The impact of the second auction was much more muted. Demand for the facility was highest in banks that were more liquidity constrained, and large, corporate borrowers tended to benefit the most from participating. Additionally, firms that had a previous history of strong profitability saw a positive impact on their supply of credit from lenders, suggesting that the policies did not lead to “zombie lending.” Smaller firms, which were more reliant on bank funding and consequently more vulnerable to a credit crunch, saw a positive effect, but not to the same degree that large and “intermediate” borrowers did. The top 1% of borrowers had an increased credit supply that was 63% larger than the average firm used in the 24-bank sample. The most important finding to come out of this study was that, according to the authors’ base estimate, every €1 billion in liquidity borrowed from the facility is associated with a credit increase of only €186 million (Andrade et al. 2017).

The Federal Reserve’s analysis of the operations found that private credit absent the LTROs would have contracted 2% more, at 5.6% compared to 3.6% with the facilities. This result

and the subsequent restoration of private credit was driven by lenders that were more exposed to the credit crunch. On the other hand, less-exposed lenders tended to use the attractive, low-rate funding to purchase higher-yield sovereign bonds, often from peripheral countries. In the case of Italy, which had established a government guarantee program, the authors found that many banks, regardless of the extent of their exposure, would self-select into the government guarantee program and then pledge those same securities as collateral. While more liquidity-constrained banks used the guarantee more, larger, less-affected banks more regularly exhibited the “reach-for-yield” behaviors described above. Specifically, the Fed found that, for every Euro borrowed, exposed and less-exposed banks invested €0.44 and €0.83 in government bonds, respectively. More-exposed banks invested €0.13 of every Euro in private credit (Carpinelli and Crosignani 2017).

One finding that appears to be mostly constant throughout various analyses of the program is that more liquidity-constrained and stressed institutions, often located in “riskier” peripheral countries, used the facilities disproportionately more. Miguel García-Posada and Marcos Marchetti discussed the bank lending channel of the monetary policy transmission of LTROs extensively, saying that the operations had “a positive, moderate-sized effect” on the supply of bank credit to firms. They estimated that annual credit growth directly attributable to the LTROs ranged from 0.8% to 1%, and that SMEs benefitted more from this credit growth because they had fewer options to raise funding that larger firms could tap. Large firms, especially those with strong lending relationships with financial institutions, were not significantly affected at all because, as the authors explain, “relationship lending is a more stable source of credit than transaction lending” (García-Posada and Marchetti 2016).

Thus, the evaluations suggested that the three-year LTROs had a mixed impact. This was due in large part to many institutions opting to keep substantial amounts of borrowed funds at the ECB, a lack of significant upward movement in major macroeconomic fundamentals, and other noneconomic factors, such as the structure of the Eurozone itself. Despite these endogenous and exogenous weaknesses, the most favorable finding was that the hit that funding markets had taken as a result of the stress induced by the sovereign debt crisis had been weathered. The precipitous falls in various macroeconomic and financial aggregates slowed, though their recovery would be slow despite continued ECB intervention.

Banks that were hit the hardest by the credit crunch tended to use the facility the most, and their less-affected counterparts still used the facilities but did little to drive the restoration of private credit. Less-exposed lenders opted instead to invest cheap central bank financing in high-yield sovereign bonds. The overall effect on the bank lending channel and, specifically, private credit, was relatively small compared to the size of the program. However, the facilities appeared to halt or considerably dampen the freezing of the Euro-area money market and prevented a credit crunch from leaking into the real economy. In a press release following the allotment of the first three-year LTRO, Mario Draghi stated that, “. . . we do think that this decision has at least prevented a credit contraction that would have been more serious, far more serious (Draghi and Constâncio 2012).”

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"Re-visiting the ECB's 3-year Long Term Refinancing Operations." Sia Partners. December 7, 2012. <https://ypfs.som.yale.edu/library/re-visiting-ecbs-3-year-long-term-refinancing-operations>.

## V. Key Program Documents

### Summary of Program

ECB announces measures to support bank lending and money market activity – European Central Bank press release issued on December 8, 2011. The document outlines the two LTRO operations as well as several macroprudential measures. <https://ypfs.som.yale.edu/node/2545>.

FAQs on the measures to support bank lending and money market activity. European Central Bank – FAQ issued by the ECB on December 8, 2011 that defines several terms important to recently LTRO operations and macroprudential measures. The FAQ also serves to further detail those measures. <https://ypfs.som.yale.edu/library/faqs-measures-support-bank-lending-and-money-market-activity>.

Impact of the Two Three-Year Longer-Term Refinancing Operations – Short box in an ECB Monthly Bulletin that displays the market conditions that precipitated the two three-year LTROs, the impact of those LTROs, and several lessons learned from the program. <https://ypfs.som.yale.edu/library/impact-two-three-year-longer-term-refinancing-operations>.

Open Market Operations: General discussion and data on all ECB open-market operations – ECB webpage explaining the mechanics of ECB open-market operations. It also provides brief explanations of and links to non-standard measures like three-year LTROs. It also links to several databases on OMOs like the LTROs. <https://ypfs.som.yale.edu/library/open-market-operations>

### Legal/Regulatory Guidance

Institutional Provision: Statute of the ESCB and of the ECB; Rules of Procedure – ECB document outlining the organization's legal framework. <https://ypfs.som.yale.edu/library/document/institutional-provisions-statute-escb-and-ecb-rules-procedure>.

### Press Releases/Announcements

Introductory Statement to the press conference (with Q&A) (12/08/2011) with Mario Draghi and Vítor Constâncio – Draghi and Constâncio press conference where the two LTROs

were discussed. The two also discussed the other macroprudential measures the ECB was taking. <https://ypfs.som.yale.edu/library/introductory-statement-press-conference-qa>.

Draghi, Mario, and Vítor Constâncio. Introductory Statement to the press conference (with Q&A) (01/12/2012) with Draghi and Constâncio – Draghi and Constâncio press conference where Draghi evaluates the performance of the LTROs. <https://ypfs.som.yale.edu/library/introductory-statement-press-conference-qa-0>.

ECB announces measures to support bank lending and money market activity (12/08/2011) – European Central Bank press release issued on December 8, 2011. The document outlines the two LTRO operations as well as several macroprudential measures. <https://ypfs.som.yale.edu/node/2545>.

## Media Stories

Draghi strikes back II (The Economist – 02/29, 2012 – Economist article evaluating the second set of LTROs and comparing them to the first. It is a critical article. <https://ypfs.som.yale.edu/library/draghi-strikes-back-ii>.

Is LTRO QE in disguise? (Vox Center for Economic Policy Research – 05/03/2012) – Short academic analysis of the ECB's LTRO programs. It argues that, while the LTROs did massively expand the ECB's balance sheet, the fact that most of the liquidity remained “parked in overnight deposits at the ECB, reducing its effectiveness for the overall monetary policy stance” when compared to quantitative easing (QE). <https://ypfs.som.yale.edu/library/ltro-qe-disguise>.

Re-visiting the ECB's 3-year Long Term Refinancing Operations. (Sia Partners – 12/07/2012) – This article evaluates the LTRO programs. One of its arguments is that the TLROs failed to adequately contain surging bond yields in several Southern European countries. <https://ypfs.som.yale.edu/library/re-visiting-ecbs-3-year-long-term-refinancing-operations>.

Rooney, Ben, and Chris Isadore. “out €529.5 billion to European banks.” (CNN Money – 02/29/2012) – This CNN Money article contains commentary on the performance of the second set of 3-year LTROs by the ECB. The commentary is largely positive. <https://ypfs.som.yale.edu/library/ecb-loans-out-eu5295-billion-european-banks>.

## Reports/Assessments

Can the Provision of Long-Term Liquidity Help to Avoid a Credit Crunch? Evidence from the Eurosystem's LTRO (Bank of France) (December 30, 2017) – This academic study looks at the monetary policy transmission capabilities of the ECB LTROs. One point it makes is that the first round of 3-year LTROs was more effective at transmitting monetary policy than the second round. <https://ypfs.som.yale.edu/library/can-provision-long-term-liquidity-help-avoid-credit-crunch-evidence-eurosystems-ltro>.

Effectiveness and Transmission of the ECB's Balance Sheet Policies (February 2017) – This research paper makes the case that the ECB LTROs were essential to mitigating recession and deflation. <https://ypfs.som.yale.edu/library/effectiveness-and-transmission-ecbs-balance-sheet-policies>.



The Effect of Central Bank Liquidity Injections on Bank Credit Supply (Federal Reserve Board) (March 9, 2017) – FRB study arguing that central bank liquidity injections can mitigate the impact of a credit crunch on affected banks. <https://ypfs.som.yale.edu/library/effect-central-bank-liquidity-injections-bank-credit-supply>.

Can Central Banks Boost Corporate Investment? Evidence from the ECB Liquidity Injections (November 26, 2018) – Analysis of the ECB's LTROs using firm-bank level data. It has a negative view of the policy, associating more LTRO funds taken with lower corporate investment and larger holdings of risky sovereign debt. <https://ypfs.som.yale.edu/library/can-central-banks-boost-corporate-investment-evidence-ecb-liquidity-injections>.

Early Repayment of Funds Raised Through Three-Year Longer-Term Refinancing Operations: Economic Rationale and Impact on the Money Market (ECB Monthly Bulletin) (February 2013) – This short excerpt from an ECB Monthly Bulletin discusses how early repayments associated with LTROs worked and why certain banks undertook repayment as well as the impact of early repayment on excess liquidity in the money markets. <https://ypfs.som.yale.edu/library/early-repayment-funds-raised-through-three-year-longer-term-refinancing-operations-economic>.

Early Repayments of Funds Raised Through Three-Year Longer-Term Refinancing Operations: Developments Since February 2013 (ECB Monthly Bulletin)(July 2013) – This excerpt from an ECB Monthly Bulletin improves on the analysis of February 2013. <https://ypfs.som.yale.edu/library/early-repayments-funds-raised-through-three-year-longer-term-refinancing-operations>.

ECB Policies Involving Government Bond Purchases: Impact and Channels (November 2017) – Study evaluating the impact of the ECB's Securities Markets Programme, the Outright Monetary Transactions, and the Long-Term Refinancing Operations on government bond yields. The bonds in question are those of Greece, Portugal, Ireland, Italy, and Spain. <https://ypfs.som.yale.edu/library/ecb-policies-involving-government-bond-purchases-impact-and-channels>.

The bank lending channel of unconventional monetary policy: The impact of the VLTROs on credit supply in Spain (November 2016) – Study of the first two 3-year LTROs using bank-firm level information from a sample of more than one million lending relationships between December 2011 and February 2012 in Spain. The study. It has a largely positive, though verging on ambivalent view of the LTROs' effectiveness. <https://ypfs.som.yale.edu/library/bank-lending-channel-unconventional-monetary-policy-impact-vltros-credit-supply-spain>.

The Effect of Central Bank Liquidity Injections on Bank Credit Supply (Federal Reserve Board) (March 9, 2017) – FRB study arguing that central bank liquidity injections can mitigate the impact of a credit crunch on affected banks. <https://ypfs.som.yale.edu/library/effect-central-bank-liquidity-injections-bank-credit-supply>.

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