

University of Piraeus

School of Economics, Business and International Studies

Department of Economics



Ph.D Thesis

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**ESSAYS IN CENTRAL BANKING AND MONETARY
POLICY**

Piraeus, Greece, January 2022

A Dissertation submitted to the Department of Economics of University of Piraeus in partial fulfillment of the requirements for the degree of Doctor of Philosophy

This research is co-financed by Greece and the European Union (European Social Fund - ESF) through the Operational Programme “Human, Resources Development, Education and Lifelong Learning” in the context of the project “Strengthening Human Resources Research Potential via Doctorate Research – 2nd Cycle” (MIS-5000432) by the State Scholarships Foundation (IKY).



Operational Programme
Human Resources Development,
Education and Lifelong Learning
Co-financed by Greece and the European Union



Πανεπιστήμιο Πειραιώς

Σχολή Οικονομικών, Επιχειρηματικών και Διεθνών Σπουδών

Τμήμα Οικονομικής Επιστήμης



Διδακτορική Διατριβή

Πάτροκλος Πατσούλης

ΔΟΚΙΜΙΑ ΣΤΗΝ ΚΕΝΤΡΙΚΗ ΤΡΑΠΕΖΙΚΗ ΚΑΙ ΝΟΜΙΣΜΑΤΙΚΗ ΠΟΛΙΤΙΚΗ

Πειραιάς, Ελλάδα, Ιανουάριος 2022

Η Διατριβή υποβλήθηκε στο Τμήμα Οικονομικών Επιστημών του Πανεπιστημίου Πειραιά για τη μερική εκπλήρωση των απαιτήσεων απόκτησης Διδακτορικού Διπλώματος

Το έργο συγχρηματοδοτείται από την Ελλάδα και την Ευρωπαϊκή Ένωση (Ευρωπαϊκό Κοινωνικό Ταμείο) μέσω του Επιχειρησιακού Προγράμματος «Ανάπτυξη Ανθρώπινου Δυναμικού, Εκπαίδευση και Διά Βίου Μάθηση», στο πλαίσιο της Πράξης «Ενίσχυση του ανθρώπινου ερευνητικού δυναμικού μέσω της υλοποίησης διδακτορικής έρευνας – 2^{ος} Κύκλος» (MIS-5000432), που υλοποιεί το Ίδρυμα Κρατικών Υποτροφιών (ΙΚΥ).



Επιχειρησιακό Πρόγραμμα
Ανάπτυξη Ανθρώπινου Δυναμικού,
Εκπαίδευση και Διά Βίου Μάθηση
Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης



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ESSAYS IN CENTRAL BANKING AND MONETARY POLICY

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Acknowledgements

I am deeply indebted to my advisor, Konstantinos Eleftheriou, for his invaluable advice and guidance during my graduate studies. His scientific drive and passion towards the economic discipline were an inexhaustible source of inspiration for me. Throughout the development of this thesis, he was a constant fount of wisdom that I could look up to. Without his persistence and guidance this thesis would not be possible.

I would also like to thank my friends and family for their support, my parents, George and Katerina, who were there for me in times of need, my brother, Gregory, who encouraged me, despite all odds, to pursuit the highest level of education, my godparents George and Despoina, for being a pillar of stability and wisdom in turbulent times, my partner Evaggelia, for inspiring me to better myself in a challenging period of my life and my dearest friends, Panagiotis, Emmanouil and Evangelos for listening to me and for being a welcome distraction throughout this anxiety inducing procedure.

In addition, I am grateful to the defence committee. Their critique and fruitful comments, helped in enhancing the final form of this thesis. Furthermore, I want to express my gratitude to my Ph.D. cohort for the time we spent together, the pleasant memories and productive discussions.

Finally, I would like to thank the State Scholarships Foundation (IKY) and its staff for supporting my scholarship throughout this whole process. I am aware that the circumstances were not ideal and I express my gratitude for the way they handled everything. Becoming an IKY scholar was a profound and life shaping experience that I will never forget.

Abstract

This dissertation contains two chapters that can be broadly categorized to the literature on exogenous shocks to the monetary system and their effects on European convergence. The two chapters attempt to empirically investigate how changes to monetary policy after the financial crisis of 2007–2009 have affected the bank credit channel, and how the COVID-19 pandemic crisis has affected the European integration process.

Specifically, Chapter 1 aims to investigate the convergence pattern of 27 countries of the European Union (EU) during the COVID-19 pandemic period by applying the Phillips and Sul (2007, 2009) methodology. The motivation behind this paper is to analyze whether there are long-term effects of the COVID-19 pandemic on the convergence process of the European Union. The hypothesis that we empirically test is that the adverse effects of the COVID-19 pandemic, resulting from the different degrees of stringency of the responses, will result in a divergence between the EU member states. As a result, this behavior will lead to deteriorating conditions among EU countries and will decelerate their unification. Our findings suggest that the countries converge into two clubs. Both clubs are composed of countries that have previously been classified as either “core” or “periphery” European countries, indicating that, in this particular crisis, this classification is too simplistic. We argue that the difference in national policies has led to a schism between the countries in the two clubs, and that fiscal policy needs to come into play if policymakers want to prevent a further weakening of the EU convergence process.

Chapter 2 explores the role of central bank interventions in the form of unconventional monetary policies (asset purchase programs) and their ability to influence bank loan supply. Through novel spatial econometric techniques, we propose that the unexpected size of the European Central Bank’s (ECB’s) quantitative easing program led to an increased loan supply from monetary

financial institutions (MFIs) after 2015, while positively affecting expectations. The effect is more pronounced on the total amount of loans provided by MFIs. The estimated models include 18 Eurozone members, and the results are based on 2502 observations (collected from Datastream, the ECB and other sources) that indicate that central bank interventions improve credit conditions through the bank credit channel, resulting in the creation of both direct and indirect spillover effects. Finally, the results also suggest that central bank interventions are expressed mainly from policy announcements as well as actual asset purchases.

Περίληψη

Αυτή η διατριβή περιέχει δύο κεφάλαια τα οποία ανήκουν στην ευρύτερη βιβλιογραφία των εξωγενών σοκ στο ευρωπαϊκό νομισματικό σύστημα και τις επιπτώσεις τους στην ευρωπαϊκή σύγκλιση. Τα δύο κεφάλαια της διπλωματικής εργασίας προσπαθούν να διερευνήσουν εμπειρικά πώς οι αλλαγές της νομισματικής πολιτικής μετά την οικονομική κρίση της περιόδου 2007-2009 έχουν επηρεάσει το δανεισμό των τραπεζών και πώς η πανδημική κρίση COVID-19 έχει επηρεάσει τη διαδικασία της ευρωπαϊκής ολοκλήρωσης.

Συγκεκριμένα, το Κεφάλαιο 1 στοχεύει στη διερεύνηση της σύγκλισης των χωρών της Ευρωπαϊκής Ένωσης, κατά την περίοδο της πανδημίας COVID-19, εφαρμόζοντας τη μεθοδολογία Phillips and Sul (2007, 2009). Στόχος αυτού του ερευνητικού ερωτήματος είναι να εντοπιστεί εάν υπάρχουν μακροπρόθεσμες επιπτώσεις της πανδημίας COVID-19 στη διαδικασία σύγκλισης της Ευρωπαϊκής Ένωσης. Η υπόθεση που δοκιμάζουμε εμπειρικά είναι ότι οι δυσμενείς επιπτώσεις της πανδημίας COVID-19, λόγω διαφορετικών βαθμών αυστηρότητας στα μέτρα αποστασιοποίησης, θα οδηγήσουν σε αποκλίσεις μεταξύ των κρατών μελών της ΕΕ. Ως αποτέλεσμα, αυτή η συμπεριφορά θα οδηγήσει σε επιδείνωση των συνθηκών μεταξύ των χωρών της ΕΕ και θα επιβραδύνει την ενοποίησή τους. Τα ευρήματά μας υποδηλώνουν ότι οι χώρες συγκλίνουν σε δύο clubs. Και τα δύο clubs απαρτίζονται από χώρες που είχαν προηγουμένως ταξινομηθεί ως Ευρωπαϊκές χώρες που ανήκουν στον «πυρήνα» ή στην «περιφέρεια», υποδεικνύοντας ότι παραμένει ενεργός ο διαχωρισμός μεταξύ των δύο. Παράλληλα υποστηρίζουμε ότι η ποσοτική χαλάρωση οδήγησε εν μέσω κρίσης σε μια αρχική σύγκλιση, αλλά μακροπρόθεσμα φαίνεται πως η απόκλιση παραμένει μεταξύ των ομάδων Club 1 και Club 2. Με αυτό ως δεδομένο το κεφάλαιο καταλήγει πως η δημοσιονομική πολιτική πρέπει να είναι πιο

ενεργή εάν οι υπεύθυνοι χάραξης πολιτικής θέλουν να αποτρέψουν την περαιτέρω αποδυνάμωση της διαδικασίας σύγκλισης ΕΕ.

Το Κεφάλαιο 2 διερευνά το ρόλο των παρεμβάσεων της κεντρικής τράπεζας με τη μορφή Αντισυμβατικών Νομισματικών Πολιτικών (προγράμματα αγοράς περιουσιακών στοιχείων) και την ικανότητά τους να επηρεάζουν την προσφορά τραπεζικών δανείων. Μέσω χωρικών οικονομετρικών τεχνικών, εκτιμούμε ότι το απρόσμενο μέγεθος του προγράμματος ποσοτικής χαλάρωσης της Ευρωπαϊκής Κεντρικής Τράπεζας (ΕΚΤ) οδήγησε σε αυξημένη προσφορά δανείων από Νομισματικά Χρηματοπιστωτικά Ιδρύματα (NXI) μετά το 2015, επηρεάζοντας θετικά τις προσδοκίες της αγοράς. Η επίδραση είναι πιο έντονη στο συνολικό ποσό των δανείων που παρέχονται από τα χρηματοπιστωτικά ιδρύματα. Τα υπολογιζόμενα μοντέλα περιλαμβάνουν 18 Ευρωζώνες και τα αποτελέσματα βασίζονται σε 2502 παρατηρήσεις (που συλλέχθηκαν από το Datastream, την ΕΚΤ και άλλες πηγές) και υποδεικνύουν ότι οι παρεμβάσεις της κεντρικής τράπεζας βελτιώνουν τους όρους δανεισμού μέσω του τραπεζικού πιστωτικού καναλιού, με αποτέλεσμα τη δημιουργία τόσο άμεσης όσο και έμμεσης επίδρασης μεταξύ των χωρών της Ευρωπαϊκής Ένωσης. Τέλος, τα αποτελέσματα υποδηλώνουν επίσης ότι οι παρεμβάσεις της κεντρικής τράπεζας εκφράζονται κυρίως από ανακοινώσεις πολιτικής καθώς και από πραγματικές αγορές περιουσιακών στοιχείων.

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Thesis Introduction

This thesis is a collection of two chapters on empirical finance/macroeconomics, with both chapters broadly falling under the theme of unconventional monetary policy in times of crisis.

The first chapter of this thesis focuses on investigating the highly disruptive financial effects of the COVID-19 pandemic and how it has affected the process of integration between European nations. Much applied and theoretical monetary economics work has focused on studying the monetary and financial integration of European nations. However, no recent study has utilized the Philips and Sul methodology of convergence in order to assess how government bond yields have been affected by an exogenous shock such as COVID-19. The pandemic has presented itself as a serious opportunity/challenge for deepening our understanding of the implementation of monetary policy across countries with different degrees of reaction to certain events. It is therefore of great importance for monetary economics to explore whether European integration has been again affected by an exogenous shock, or if the mechanisms that were put in place after the financial crisis of 2007 have shielded the European experiment.

Previous literature has reported a divergence between European economies (Copelovitch et al., 2016; Fouquet and Broadberry, 2015; Gräbner et al., 2020; Jinjara et al., 2021), but it has not taken into account the possibility of unconventional monetary policy being the primary factor for the divergence. The main hypothesis behind this line of thought is that, even though policies such as quantitative easing are aiding convergence in the short term, their long-term effects seem to promote divergence between country yields. In the first chapter, we explore this hypothesis and argue that the policy seems to have become a “necessary evil” as, after the crisis of 2007, urgent times called for urgent measures and the policy, even though having started as a measure of last resort, has now become a staple in the arsenal of the ECB. As the chapter progresses, we point out

the necessity of designing fiscal policies that implement measures of convergence in order to avoid a further deterioration of the European project.

The second chapter looks at how the bank credit channel has been affected by central bank policy changes, and how this was transmitted across European economics. Despite the popularity of studies that focus on the spillover effects of monetary policy on financial markets, there is a lack of research solely focused on analyzing the effects of unconventional monetary policy on bank credit. In reality, the high degree of interconnectedness among European financial institutions is rarely taken into account when central monetary policies are constructed and as a result, their positive or negative spillover effects are underestimated. To this end, Chapter 2 estimates a spatial econometric model that allows for a set-up of monetary policy transmission that is closer to reality. In particular, we assume that there is an a priori mechanism of interconnectedness among the members of the European Economic and Monetary Union and estimate the spillover effects through several different mechanisms of interconnectedness. The findings of the chapter indicate that, as a total, the unconventional monetary policies employed by the ECB after 2015 resulted in increased credit from commercial banks, but did not manage to stimulate all credit subcomponents equally. In general, central government credit seems to be the section of the economy that was affected the most, while pension funds and households seem to have been unaffected for the most part.

As a final note, it is important to consider that the contribution of this paper is equally important for policymakers as well as for central bankers. By highlighting the shortcomings of the present unconventional monetary policies, this paper stresses the importance of designing fiscal responses that, on a national level, better account for the disruptive nature of unified monetary measures in heterogenous states.

Chapter 1

Sovereign bond yields in the EU and COVID-19 government responses: A convergence analysis

1.1 Introduction

Since the beginning of the COVID-19 pandemic, countries' resilience has been tested to its limits. Millions of livelihoods have been affected and conquered civil rights were temporarily revoked in an attempt to limit the spread of the highly contagious COVID-19 disease. The countries that belong to the European Union (EU) were no exception to this, and were the unfortunate recipients of one of the most intense waves of the pandemic, with Italy and Spain being the poster children for what was the severity of the pandemic like in the EU.

Unlike the global financial crisis of 2007-2009, the response of the European Monetary Union (EMU) and of the European Central Bank (ECB) was swift, homogeneous and decisive. In March of 2020, the ECB announced a new round of Unconventional Monetary Policy purchases, under the Pandemic Emergency Purchase Program (PEPP). This announcement came amidst an increase in government bond yields and disrupted their increasing trajectory. The increase in yields was most notable in countries that had been heavily affected by the COVID-19 pandemic (e.g., Italy and Spain) or by countries with weak macroeconomic fundamentals (e.g., Greece). The ECB's announcements helped in consolidating financial stability and ensured the necessary supply of liquidity, thus preventing any further increase in yields and supporting governmental stability of Member States.

While the above intervention was welcomed by the markets and managed to contain the increase in yields, the effects of the pandemic were mostly heterogeneous amongst EU countries, due to the fact that each Member State had a different way in which it responded to the pandemic

(different degree of lockdown measures, economic support and health response). Therefore, it is important to understand the degree of heterogeneity in the EU and how the COVID-19 pandemic has affected the process of integration amongst Member States. Sovereign bond yields in the euro area have been converging between EMU countries since the 90's, in part due to the Maastricht rules and in part due to the anticipation of a more unified EU after the adoption of the euro as a single currency and the consequent elimination of exchange rate risk (European Central Bank, 2003). This convergence process was severely affected by the financial crisis (Antonakakis et al., 2017), with the members of the periphery exhibiting increased divergence from the core EU countries. As the largest financial disruption since the global financial crisis, the COVID-19 pandemic has the inherit ability to amplify the disparities between core and periphery EU countries.

In this paper, we aim to examine the convergence behavior of sovereign bond yields in the EU during the COVID-19 pandemic in order to test the effectiveness of the ECB's unified monetary policy response (through the announcement of the PEPP) in preventing yields divergence. Within this context, we also test if the intensity of government interventions for the reduction of the COVID-19 dispersion had an impact on the convergence pattern of bond yields. To this end, we apply the Phillips and Sul (2007, 2009) convergence methodology and contribute to the literature in the following way:

- We examine the convergence process of sovereign bond yields in the EU under a major exogenous financial disruption event (COVID-19), something that to the best of our knowledge is not catalogued in the literature.
- We study whether the nature of government interventions against the dispersion of COVID-19 affected the convergence behavior of sovereign bond yields. The EU is a

unique case when it comes to how it tackled the financial emergency caused by the pandemic, since in the majority of the EU Member States the monetary policy response was centralized (PEPP), while the governmental response (e.g., lockdown measures) of each Member State was decentralized. As a result, the same monetary policy response could have had a different effect on each country.

We find two major clubs of convergence and reject full sample convergence. Our results indicate that the COVID-19 pandemic had an adverse effect on the convergence of bond yields in the EU, which if not treated appropriately (through fiscal policy on a national level) could lead to long lasting negative effects.

The remainder of this paper is organized as follows. The next section describes the related literature, while Section 3 presents the methodology. Section 4 discusses the data and Section 5 presents our main findings. Finally, Section 6 concludes the paper.

1.2 Literature review

Initial attempts to model the convergence of bond yields utilized the more traditional Augmented Dickey Fuller (ADF) (Dickey and Fuller, 1979) testing approach (Siklos and Wohar, 1997). With the continuous development of econometric techniques, different tools have surfaced in the literature that can be used to uncover the convergence patterns. A typical example is the application of fractional integration techniques to test for the persistence in sovereign bond yields (Baum and Barkoulas, 2006, Sibbertsen et al., 2014). However, these studies predate the COVID-19 pandemic and therefore do not consider its possible impact on bond yields. Moreover, the ongoing effort to catalogue the COVID-19 effects has led researchers to predominantly focus on how bond yields responded to the pandemic, and not whether their long run convergence process towards a steady state was disrupted. As such, most studies report the increase in yield rates as an

immediate consequence of the pandemic and highlight the negative impact of national lockdown restrictions. Furthermore, they argue that announcement of interventions by central banks managed to alleviate the situation and provide reassurance and liquidity to the issuers (Pang et al., 2021; Rebucci et al., 2020; Sène et al., 2021). Similar evidence regarding the effect of economic stimulus (through fiscal or monetary policy) has been examined in the literature and findings suggest that in the majority of cases central bank interventions lead to a stabilization in international financial markets when the number of COVID-19 cases is rising (Janus 2021; Wei et al., 2021; Zaremba et al., 2021a; Zaremba et al., 2021b).

As a final note it is worth mentioning that with the adoption of the euro as a common currency, the convergence process of EU countries in terms of bond yields was expected to move at a faster pace due to the elimination of the exchange rate risk. However, in times of economic uncertainty and increased international risk factors, sovereign yields of EU countries, tend to exhibit wider spreads since investors turn their attention to more liquid and less risky assets (Barrios et al., 2009; Bernoth and Erdogan, 2012; Favero et al., 2010). To this end it is important to answer the question of whether the convergence process of EU countries was affected by the pandemic.

1.3 Methodology

This section outlines the Phillips and Sul (2007, 2009) methodology¹ used in order to test whether sovereign bond yields exhibit signs of convergence during the COVID-19 pandemic. The Phillips and Sul (hereafter PS) methodology can be summarized as follows. Equation (1) indicates that if X_{it} is the yield of a given sovereign bond for country i at time t , then

¹ A more detailed description of the advantages this particular clustering algorithm offers is described in Apergis et al. (2013).

$$X_{it} = \delta_{it}\mu_t, \quad (1)$$

where δ_{it} is the individual factor that measures the deviation that each country i exhibits from its common trend μ_t and is defined as

$$\delta_{it} = \delta_i + \sigma_i \xi_{it} L(t)^{-1} t^{-a}, \quad (2)$$

In equation (2), δ_i is a time-invariant fixed value, σ_i are the idiosyncratic scale parameters, and ξ_{it} depends weakly over t with $\xi_{it} \sim iid(0,1)$. $L(t)$ is a slow varying function that moves towards infinity as t moves towards infinity. The approach highlighted by PS utilizes a one-sided t -test, in order to test the null hypothesis (H_0) of convergence for all i against the hypothesis of non-convergence (H_A) (either for all i or for some of them). More specifically

$$H_0 : \delta_i = \delta \text{ and } a \geq 0; H_A : \delta_i \neq \delta \text{ or } a < 0. \quad (3)$$

Hypothesis testing of the null (H_0) in (3), follows regression (4):

$$\log\left(\frac{K_1}{K_t}\right) - 2 \log L(t) = \hat{c} + \hat{b} \log t + \hat{u}_t, \quad (4)$$

for $t = [rT], [rT] + 1, \dots, T$ with some $r > 0$,² $K_t = (1/N) \sum_{i=1}^N (k_{it} - 1)^2$,

$$k_{it} = \frac{X_{it}}{N^{-1} \sum_{i=1}^N X_{it}} = \frac{\delta_{it}}{N^{-1} \sum_{i=1}^N \delta_{it}}, \quad L(t) = \log(t) \text{ with } \hat{b} = 2\hat{a} \text{ and } \hat{a} \text{ being the least-squares}$$

² Following Phillips and Sul (2007, 2009), r is set equal to 0.3.

estimate of a under the H_0 . Finally, the H_0 of convergence cannot be rejected at the 5% level for $t_{\hat{b}} > -1.65$.

In case the algorithm rejects full sample convergence, we follow the four-step approach proposed by Phillips and Sul (2007) to identify convergence clubs.

Determining whether further convergence clubs exist is done by applying the Phillips and Sul (2009) procedure and calculating transitions paths (Figure 1.1).

(i) The first step is ordering the N sovereign bond yields for each country by putting the last period highest yield first, the one after that second and so forth.

(ii) After core clubs are formed, we proceed by selecting the first k highest-ordered sovereign bond yield (for each country) [as described in step (i)] with $2 \leq k \leq N$, and the convergence t -statistics (t_k) using eq. (4) is computed. The size k^* of the club is finally determined by the t -statistic of the $logt$ regression presented in eq. (4), with $t_k > -1.65$.

(iii) The third step indicates adding (from the remnants of $N - k^*$ countries) one by one sovereign bond yields to the core clubs, if the t -statistic is greater than zero and by following step (ii).

(iv) Finally, we repeat steps (i)-(iii) for all remaining journals until no new clubs can be formed.

1.4 Data and descriptive statistics

The dataset used in this paper is a balanced panel that consists of daily data for twenty-seven countries ($N = 27$), in a period that spans from December 2, 2019 to May 5 2021. The main

variable of interest in our analysis is the sovereign bond yields of 26 European countries and the UK. All data were collected from Eurostat and are part of its convergence criteria database. Country selection was restricted to the EU countries that have been in the process of convergence as a prerequisite of the Maastricht Agreement and the UK.³ The corresponding descriptive statistics are presented in Table 1.1 and the evolution of bond yields is illustrated in Figure 1.2. From Table 1.1, we note that the countries with the highest mean are Poland, Hungary and Romania. On the other hand, Romania together with Cyprus and Greece exhibit the highest standard deviation. This is contrasted by countries such as Germany, France, Luxembourg and Finland that have among the lowest reported deviation across the sample. Moreover, Greece reports the highest bond yield value, while Germany reports the lowest. Finally, the data for government response indices were retrieved from Oxford COVID-19 Government Response Tracker (OxCGRT) database (Hale et al., 2021) and cover the period December 2, 2019 to May 5, 2021⁴.

[Insert Table 1.1 around here]

[Insert Figure 1.1 around here]

1.5 Results and discussion

The results of the PS convergence test are reported in Table 1.2. The hypothesis of full sample convergence (to a single steady state) is rejected at the 5% level of significance (see the first row in Panel A of Table 1.2). Moreover, the club clustering algorithm indicates that our sample countries can be grouped into two different convergence clubs. Panel B reports whether

³ Even though UK is no longer a part of the European Union, its sovereign bond yields are following a similar trajectory to the European Union for the past 20 years.

⁴ Government Responses begin from January 1, 2020. For all of December the value of the indices was 0.

the original convergence clubs can be merged and form a larger convergence club. Since we only have two clubs, merging to a larger club would indicate full sample convergence. The PS algorithm fails to achieve further merging, and full sample convergence is thus rejected. Hence the original subgrouping of two clubs holds. The behavior of the transition paths (see Figure 1.1) reveal a rather striking result; after the announcement of the initial quantitative easing program (January-March 2020 – see vertical solid line in Figure 1.1), transition paths indicate a convergence effect between clubs, with this effect being ephemeral.

[Insert Table 1.2 around here]

[Insert Figure 1.2 around here]

To further scrutinize the above result, we examine the impact of a factor of divergence for the reporting period (see Table 1.3); government responses to COVID-19. Figures 1.3-1.6 present the difference in government responses of each convergence club to the COVID-19 pandemic.

[Insert Figure 1.3 around here]

[Insert Figure 1.4 around here]

[Insert Figure 1.5 around here]

[Insert Figure 1.6 around here]

[Insert Table 1.3 around here]

As we note from the above figures, Club 2 countries were more prone to overreact to the different waves of the pandemic. To further quantify this picture, we test whether there is a statistically significant difference in the mean of the four main COVID-19 government response

indices (Stringency, government response, containment health and economic support)⁵ between the two convergence clubs. Our findings indicate a non-significant difference in mean values between the two clubs for all of the main components of COVID-19 countermeasures with the exception of the economic support index. This enables us to gain some insight about the impact of COVID-19 policies and interventions on sovereign bond yields. In particular, while one would have expected that the intensity of government responses against COVID-19 could have contributed to the divergence of certain country yields, investors seem to consider COVID-19 countermeasures as more or less uniform. All in all, the announcement of the PEPP had a temporary convergence effect on European sovereign bond yields (see Figure 1.2), while the intensity of government measures against COVID-19 appears not to explain the observed divergence pattern of yields. A possible explanation is that investors seem to pay more attention to a country's fundamentals and less to the existence of common monetary policy and emergency national interventions under a global exogenous shock. This highlights the need for a strong push towards the adoption of appropriate fiscal policies.

1.6 Conclusion

This paper attempts to examine the convergence pattern of sovereign bond yields in EU during the COVID-19 pandemic and the effect of COVID-19 stringency policies on this pattern. To this end, we employ the Phillips and Sul (2007, 2009) convergence methodology.

Our empirical results indicate that sovereign bond yields diverge to two different clubs of countries for the period under consideration. As highlighted above, this divergence on sovereign

⁵ For more information about the definition of those indices, see <https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker>

yields is not an adverse effect of the different COVID-19 stringency policies implemented by each country but to an extent an inability of quantitative easing to further promote convergence. The above result justifies the adoption of common fiscal policies for the prevention of this divergence pattern.

A second important finding is that the two convergence clubs include countries belonging to both the ‘core’ and the ‘periphery’ of EU. More specifically Club 1 includes Czech Republic, Denmark, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Spain, Sweden, United Kingdom, Bulgaria and Croatia, while Club 2 includes Austria, Belgium, Cyprus, Finland, France, Germany, Ireland, Luxembourg, Netherlands, Slovakia and Slovenia.

Concluding it can be argued that the inability of unconventional monetary policies to further advance convergence, justifies the need for the adoption of a more unified approach when it comes to combating the negative effects of emergencies (of exogenous nature) such as pandemics with policies that promote convergence. Therefore, future research could focus on investigating the exact way this could be achieved.

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Appendix

Table 1.1: Descriptive statistics

<i>Countries</i>	<i>Observations</i>	<i>Mean</i>	<i>St. Dev.</i>	<i>Min.</i>	<i>Max.</i>
Austria	375	-0.20	0.17	-0.48	0.32
Belgium	375	-0.13	0.18	-0.44	0.54
Bulgaria	375	0.23	0.15	0.12	0.70
Croatia	375	0.74	0.22	0.47	1.32
Cyprus	375	0.73	0.51	0.15	2.25
Czech Republic	375	1.28	0.34	0.75	1.98
Denmark	375	-0.31	0.16	-0.83	0.07
Finland	375	-0.20	0.15	-0.49	0.29
France	375	-0.13	0.15	-0.38	0.36
Germany	375	-0.47	0.12	-0.85	-0.20
Greece	375	1.17	0.47	0.57	4.15
Hungary	375	2.28	0.27	1.73	3.31
Ireland	375	-0.05	0.16	-0.33	0.48
Italy	375	1.06	0.42	0.44	2.68
Latvia	375	-0.09	0.19	-0.31	0.39
Lithuania	375	0.21	0.07	0.16	0.31
Luxembourg	375	-0.41	0.12	-0.79	-0.11
Malta	375	0.46	0.15	0.14	0.83
Netherlands	375	-0.36	0.14	-0.64	0.00
Poland	375	1.51	0.33	1.11	2.34
Portugal	375	0.37	0.28	-0.04	1.45
Romania	375	3.67	0.74	2.09	5.87
Slovakia	375	-0.06	0.32	-0.57	0.87
Slovenia	375	0.05	0.26	-0.30	0.89
Spain	375	0.35	0.23	-0.01	1.06
Sweden	375	0.05	0.17	-0.51	0.46
United Kingdom	375	0.42	0.23	0.08	0.88

Notes: Descriptive statistics of sovereign bond yields for all 27 countries in our sample. Weekends are excluded from the dataset.

Table 1.2: Club convergence of sovereign bond yields

Clubs	Countries	<i>b</i> coefficient	<i>t-stat</i>
<i>Panel A: Club Convergence</i>			
<i>Full sample</i>		-0.715 (0.171)	-4.170
<i>1st convergence club</i>	Bulgaria, Croatia, Czech Republic, Denmark, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Spain, Sweden, United Kingdom (Mean value of Club 1 = 0.837)	-0.322 (0.224)	-1.434
<i>2nd convergence club</i>	Austria, Belgium, Cyprus, Finland, France, Germany, Ireland, Luxembourg, Netherlands, Slovakia, Slovenia (Mean value of Club 2 = -1.011)	1.737 (2.361)	0.736
<i>Panel B: Club Merging</i>			
<i>1st + 2nd convergence club</i>	-	-0.715 (0.171)	-4.170

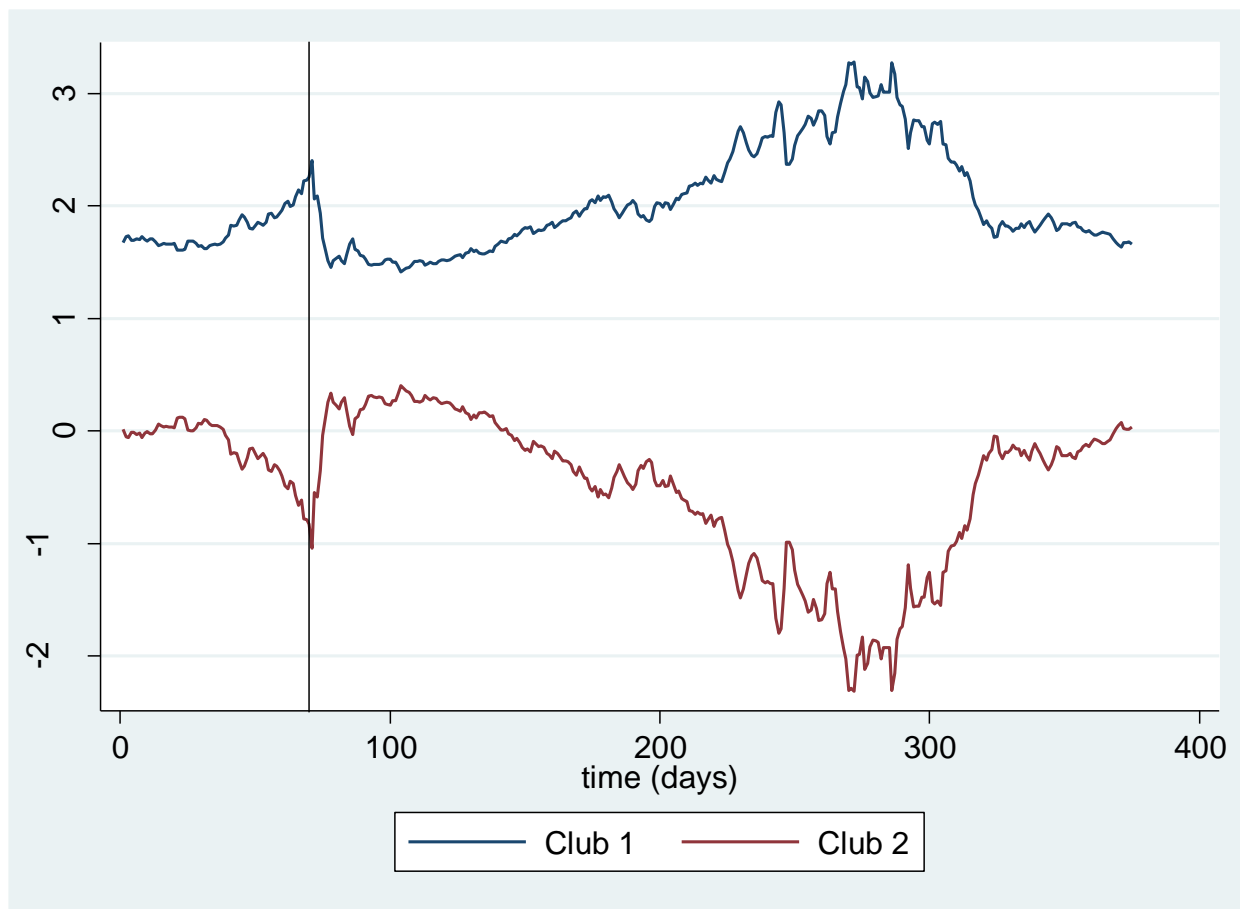
Notes: *b* coefficient is the coefficient of convergence, and *t-stat* is the corresponding test statistic. *t-stat* is a simple one-sided *t*-test with critical value -1.65 . All estimations were performed in Stata with the codes of Du (2017). Standard errors are reported in parentheses.

Table 1.3: Convergence and COVID-19 government response indices

Index	<i>Stringency</i>		<i>Government Response</i>		<i>Containment Health</i>		<i>Economic Support</i>	
	1	2	1	2	1	2	1	2
Convergence club #								
Index mean value	50.769	51.328	49.920	52.324	49.160	50.757	55.242*(n.s.)	63.299*(n.s.)

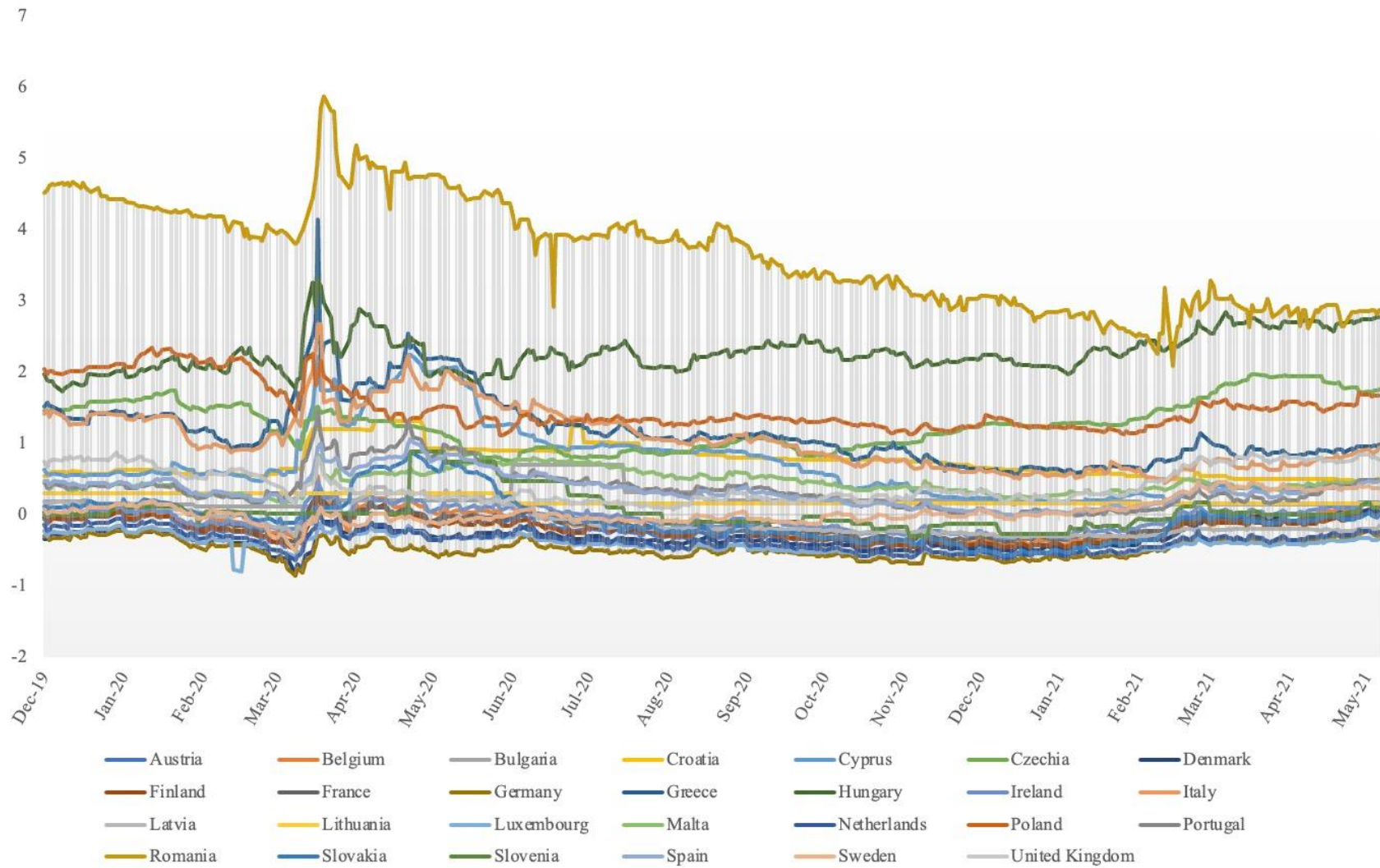
Notes: Except for economic support index, there is no statistically significant difference between the means of indices across clubs. ***, ** and * indicate the rejection of the null hypothesis of equality of means at 1%, 5% and 10% level of statistical significance, respectively. The test for the equality of means is conducted allowing for both heterogeneous and homogeneous covariance matrices across groups (if the result of the test under heterogeneous covariance matrices is different, then the corresponding significance is reported in parentheses). n.s.: not significant.

Figure 1.1. Transition Paths



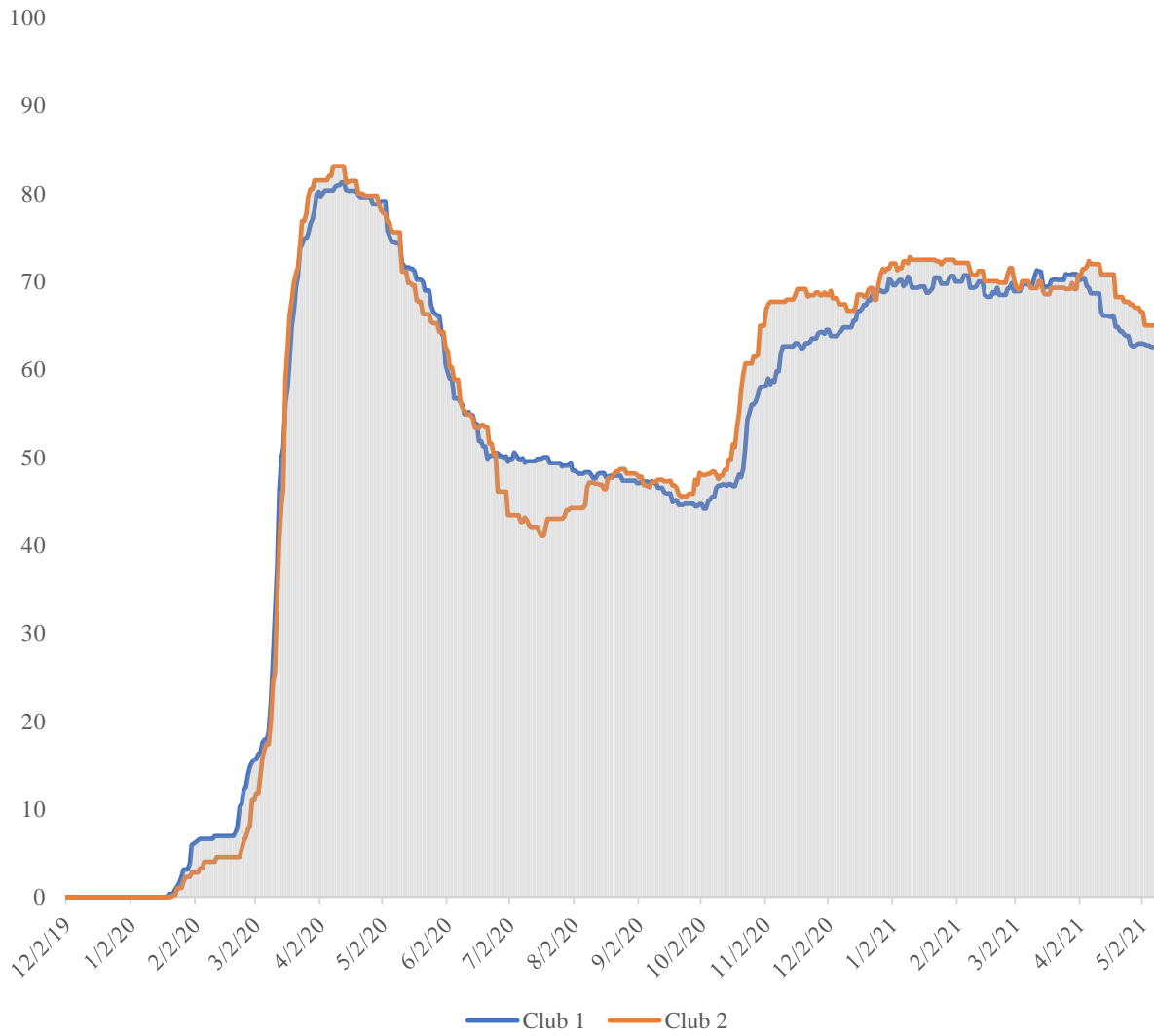
Notes: This graph illustrates the transition paths for Club 1 and Club 2 for the period December 2, 2019 to May 5, 2021. The vertical axis depicts the yield value, while the horizontal axis depicts the date. The vertical line dividing line depicts the beginning of PEPP.

Figure 1.2. Bond yields during the Covid-19 pandemic period



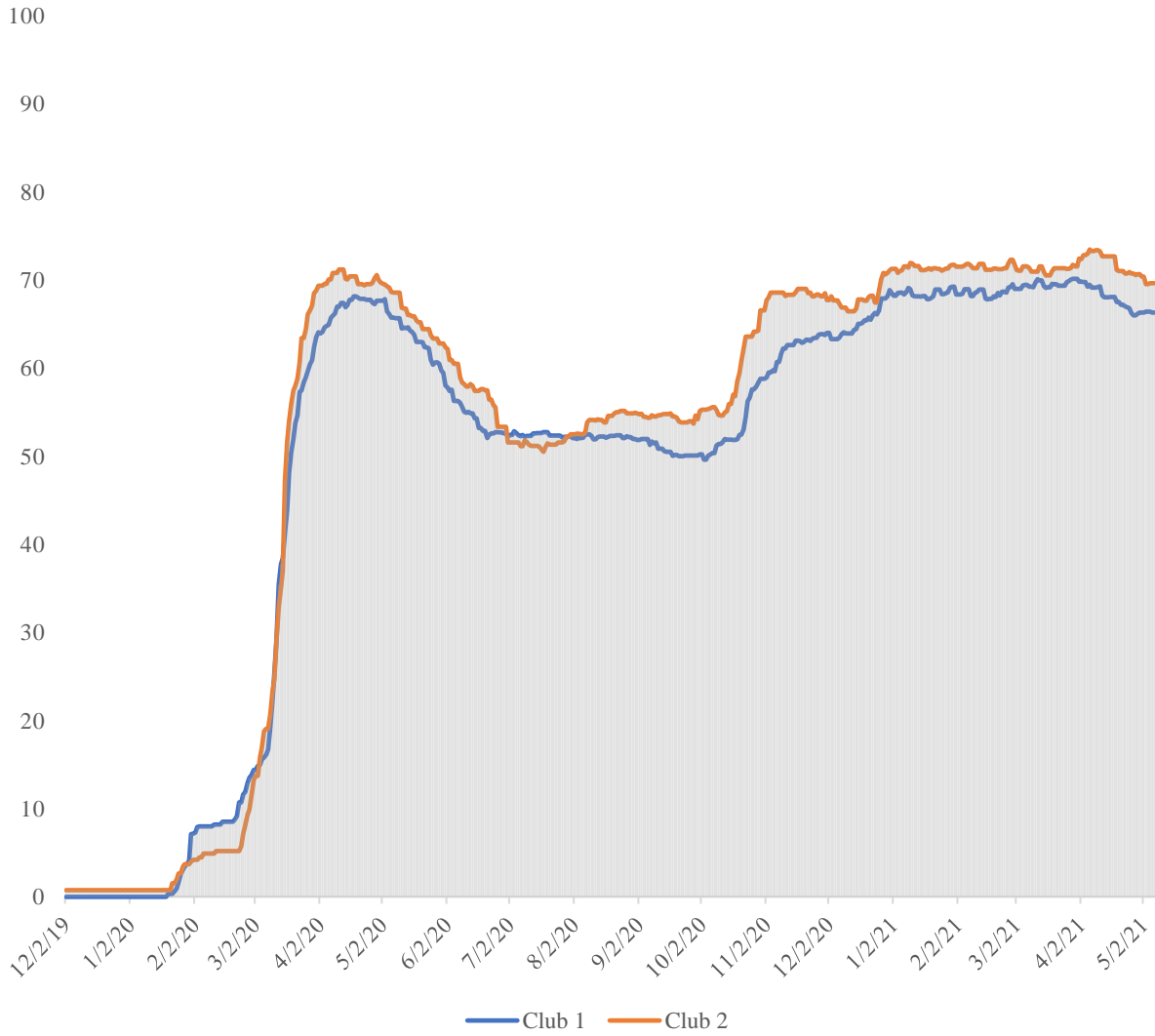
Notes: This graph illustrates the daily government bond yields for the period December 2, 2019 to May 5, 2021. The vertical axis depicts the yield value, while the horizontal axis depicts the date.

Figure 1.3. Stringency index



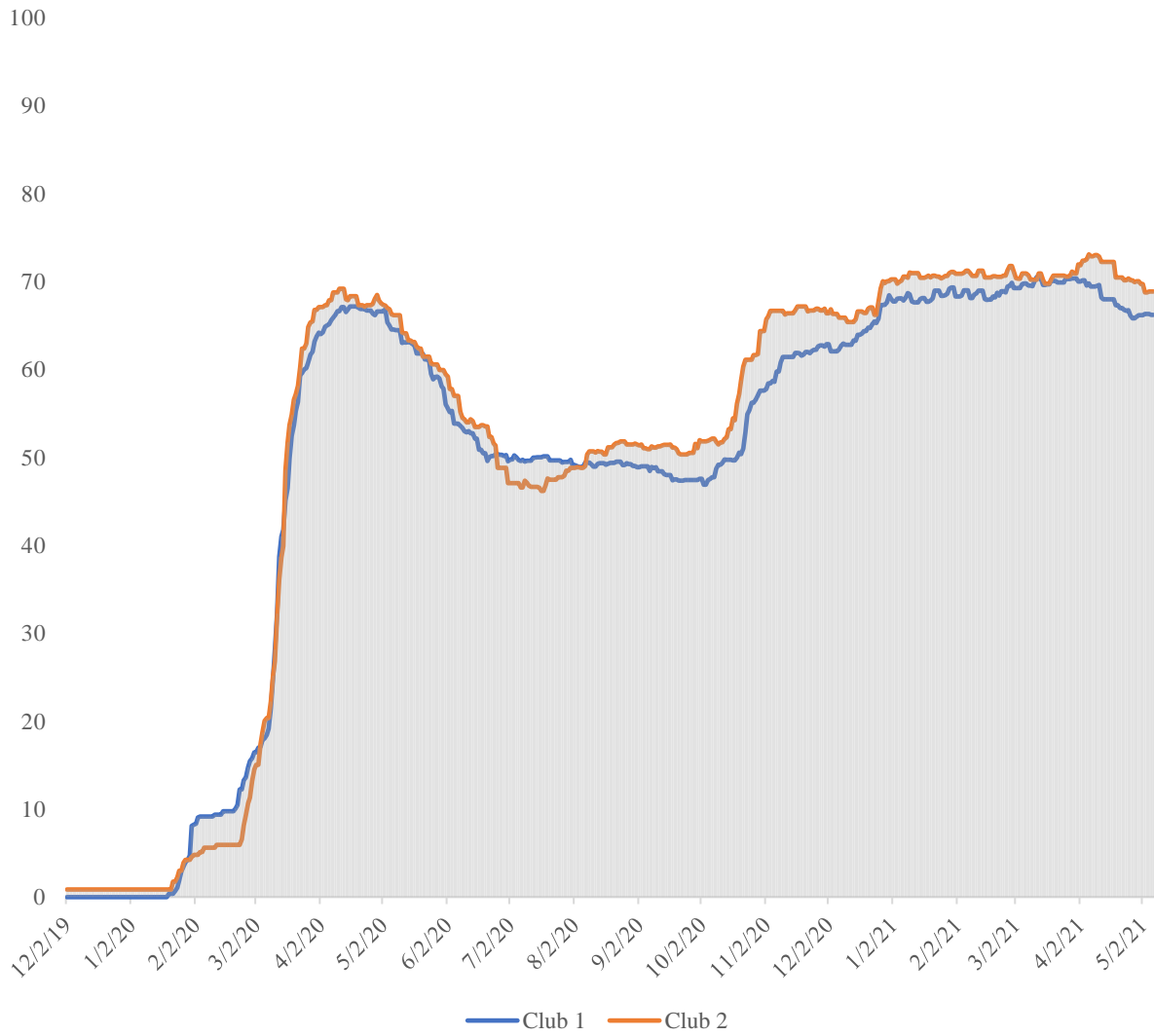
Notes: This graph illustrates the mean value of the Stringency Index for each convergence club for the period December 2, 2019 to May 5, 2021. The values of the index range from 0 to 100 basis points, with 0 being the lowest and 100 being the highest. The vertical axis depicts the value of the index, while the horizontal axis depicts the date.

Figure 1.4. Government Response



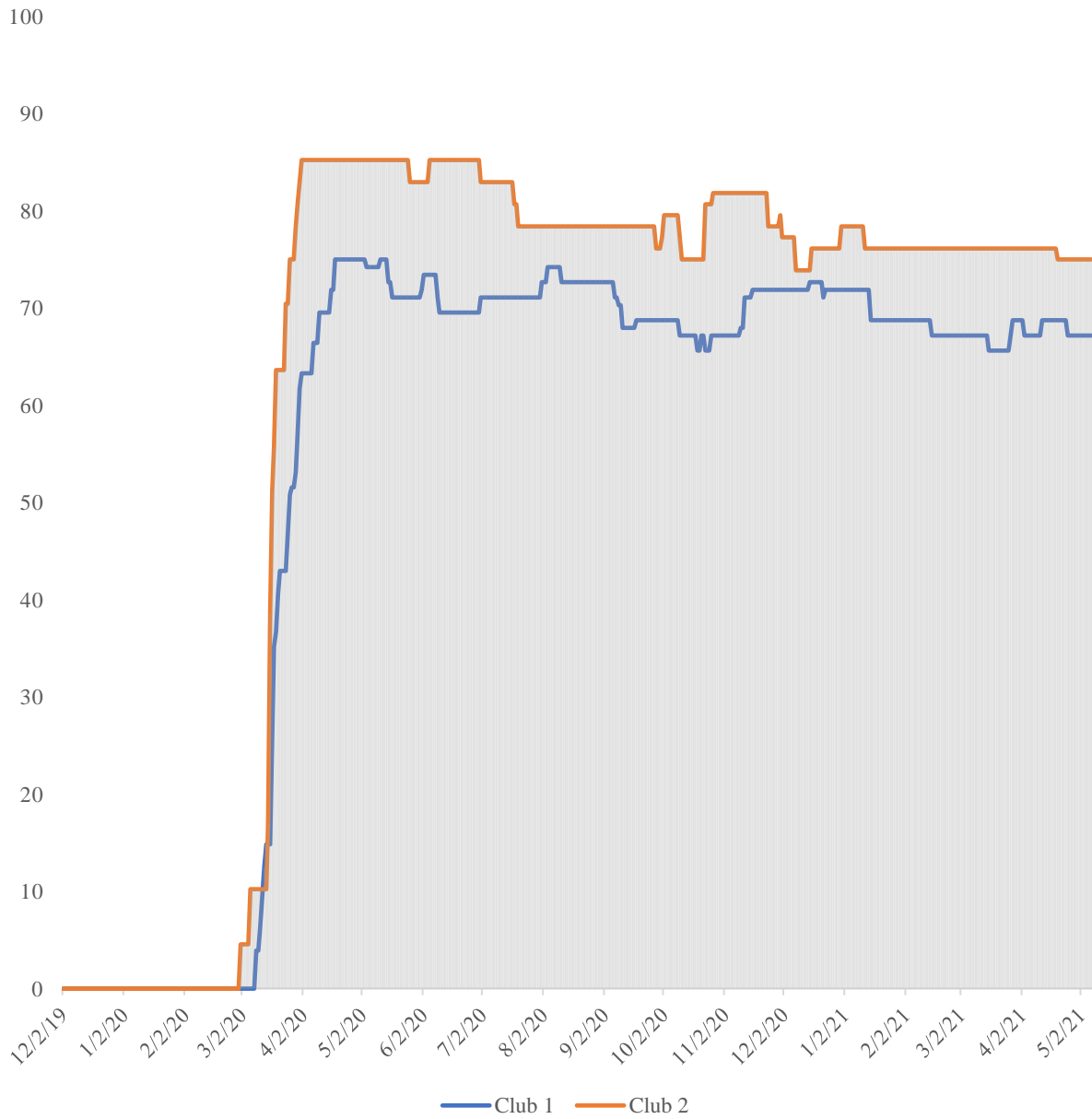
Notes: This graph illustrates the mean value of the Government Response Index for each convergence club for the period December 2, 2019 to May 5, 2021. The values of the index range from 0 to 100 basis points, with 0 being the lowest and 100 being the highest. The vertical axis depicts the value of the index, while the horizontal axis depicts the date.

Figure 1.5. Containment Health



Notes: This graph illustrates the mean value of the Containment Health Index for each convergence club for the period December 2, 2019 to May 5, 2021. The values of the index range from 0 to 100 basis points, with 0 being the lowest and 100 being the highest. The vertical axis depicts the value of the index, while the horizontal axis depicts the date.

Figure 1.6. Economic Support



Notes: This graph illustrates the mean value of the Economic Support Index for each convergence club for the period December 2, 2019 to May 5, 2021. The values of the index range from 0 to 100 basis points, with 0 being the lowest and 100 being the highest. The vertical axis depicts the value of the index, while the horizontal axis depicts the date.

Spillover effects of Unconventional Monetary Policy on European MFI Credit: An event study

2.1 Introduction

The aftermath of the 2010 European crisis of sovereign debt had a profound effect on academia and central bank decision-making. It generated a paradigm shift in the way that academics think about their research agenda and how policymakers view the inner workings of the economy. The economic disruptions in financial markets reported during that period affected economies in a profound way and generated unprecedented economic losses, while heavily impacting market liquidity. This led to an ever-growing literature that focused on answering questions related to contagion in financial and credit markets.

The bank credit channel was heavily affected by the financial crisis as it experienced severe adverse effects leading to the failure of the credit mechanism due to increased risk aversion and the weakening of credit to the private sector (Olmo and Sanso-Navarro, 2015). In response to this unprecedented worldwide economic contraction, central banks implemented unconventional monetary policies (Joyce et al., 2012) in an effort to stimulate credit, since conventional monetary policy tools became ineffective.

Empirical research on the bank credit channel and its effectiveness under conventional monetary policy has been extensively conducted in the past. Such discussions can be found in Gambacorta and Marques-Ibanez (2011) and Olivero et al. (2011), who highlight how bank characteristics can impact the provision of credit. Recently, the literature has focused on the low interest rate era that the banking sector is experiencing, which has led bank managers to make riskier investments, and as a result, has undercut the efficient operation of the traditional credit

channel (Altunbas et al., 2012; Delis et al., 2017). In general, the credit literature which examines the effects of conventional monetary policy on the bank credit channel points out that monetary shocks leads to shifts in loan supply. This means that if the central bank follows a stricter monetary policy, liquidity will become scarce for monetary financial institutions, and banks will be forced to restructure their assets and reduce their reserves, and vice versa.

With the introduction of quantitative easing (QE) by central bankers, a new cycle of heated discussions began that focused on the effectiveness of monetary policy and the extent to which central banks should intervene with largely untested policies. There is a limited number of attempts catalogued in the literature that assess the impact of QE on the bank credit channel. The majority report similar results (QE programs positively affecting bank credit) and focus either on a national (Garcia-Posada and Marchetti, 2016; Giansante et al., 2019; Rodnyansky and Darmouni, 2017) or on a supranational level (Bowman et al., 2015) without considering the possible spillover effects.

Typical examples from this strand of the literature reported that non-standard US monetary policies near the zero lower bound (ZLB) had a significant adverse effect on the competitiveness of shadow banks (Di Maggio and Kacperczyk, 2017). This effect increased the market's probability of runs and defaults due to the lower level of available supply of capital to financial institutions and large corporations. Another example that follows closely can be found in the business cycle model introduced by Güntner (2015), who considered a model with bank liquidity risk. He argued that asset purchases could become ineffective as commercial banks have an incentive to form a large capital base and not hold the expected amount of liquidity.

Unconventional monetary policy measures provide liquidity to the banking system and lead to a decrease in government bond yields. This effect is not persistent and can only exist for as long as central banks purchase assets (Krishnamurthy and Vissing-Jorgensen, 2011). Olmo and Sanso-

Navarro (2015) developed a bank model where they highlighted the role of unconventional monetary policies in restoring stability to the bank credit channel by restabilizing the rest of the transmission mechanisms. Their work highlights the connection between real income, interest rates and money stock, and pinpoints the important role that a competitive banking sector plays in the economy. Finally, even though the transmission mechanism of conventional and unconventional monetary policy differs, they both have similar effects on the economy (Peersman, 2011).

To our knowledge, none of the aforementioned papers take into account the possible spatial nature of QE, and while there is a growing literature investigating the effects of QE, the spatial econometric approach that allows the researcher to account for spatial dependency and estimate direct and indirect effects has not yet been catalogued. This is an important aspect when considering the implementation of QE policies, which policymakers need to think about when contemplating unconventional monetary policies and setting the limit of asset purchases.

This paper attempts to turn the attention of those in the academic and policymaker community to the spillover effects created by unconventional monetary policies. We complement the growing literature on quantitative easing and bank credit, while also filling an existing gap by accounting for the spillover effects of unconventional monetary policies on the credit channel. The main contributions of our paper can be summarized as follows:

- We investigate the effects of the ECB's unconventional policies on credit market anticipation and find a positive effect on credit.
- We highlight the heterogenous effects of unconventional monetary policies on different bank credit components.
- We find evidence of bank credit spillovers in a cross-country (monetary union) set-up.
- And estimate the positive direct and indirect spillover effects from QE on bank credit.

2.2 How do central banks transmit (un)conventional monetary policy?

Since the 1980s, theoretical and empirical studies have attempted to explain the way that monetary policy can be transmitted to the economy. A prominent example of these debates can be found in King (1986) and Bernanke and Blinder (1988), who were among the first to set the tone for this discussion. As the crisis of 2007–2009 unfolded and conventional monetary policy in the Economic and Monetary Union (EMU) became ineffective, unconventional policy measures were implemented to combat disinflationary pressures and the spiraling down of European economies.

While this paper does not present every possible way to utilize unconventional monetary measures, it is worth mentioning the main paths through which a central bank can transmit monetary policy and how it differs from standard monetary policy. The key difference between the two is that conventional measures focus on interest rates, while unconventional policy focuses on buying assets and expanding the balance sheet of central banks. Large-scale asset purchases can impact interest rates and bank credit from a number of different transmission mechanisms. A question that scholars have attempted to answer is how QE is transmitted to the real economy. The literature suggests five main paths of QE transmission: the signaling channel, mortgage risk, corporate bond risk premiums, the supply of assets channel, and the inflation channel (Krishnamurthy and Jorgensen, 2011). In addition to these channels, QE may also affect the economy through other channels (Hausken and Ncube, 2013). One of these channels is the bank credit channel, which, among others, is also effective in lowering interest rates (Hausken and Ncube, 2013).

Through QE purchases, the prices of assets increase and expectations of short-term interest rates decrease, due to the reduction of the term premium. An increased level of asset prices will result in a net wealth gain in asset holdings and a subsequent reduction in borrowing costs by

boosting nominal spending, which will lead to economic growth, lower unemployment, and increased inflation. Asset prices may impact bank credit and confidence channels in two different ways:

- (a) An improved level of liquidity will incentivize banks to provide new loans to the economy;
- (b) Renewed investor confidence may impact investment and corporate spending.

In this paper, we complement the literature with evidence regarding the impact of QE on the bank credit channel, which central banks use to affect the economy by providing commercial banks with credit expansions (increased credit). Through such mechanisms, banks fuel the economy with liquidity, fill investors with confidence (by altering their investment sentiment), and provide households with credit to lend, invest and consume. Such changes to the economy have an impact on inflation and growth. Previous attempts, such as the one here, can be found in Bowman et al. (2015) and Martins et al. (2019), where they found that asset purchase programs have a significant effect on credit. On a similar note, recent papers by Salachas et al. (2017) and Garcia-Posada and Marchetti (2016) examined the EMU and found a significant increase in credit to the private sector due to large-scale asset purchase programs. However, none of these papers consider the spillover effects of this policy. Spillover effects are an important aspect of QE because they can further enhance (or dampen) the policy's disrupting nature.

This paper links the literature on the bank credit channel and the transmission of unconventional monetary policy. To this end, we attempt to disentangle the spillover effects generated by unconventional monetary policies on bank credit by focusing our attention on the European Central Bank's implementation of QE. Studying the bank credit channel is important as credit shocks, in times of crisis, contribute substantially to variations in output (Liu and Mingford, 2014). To this end, we utilize a spatial econometric approach that allows us to account for the

effects not only to the country of origin, but also to its foreign partners. The methodology is implemented on 18 Eurozone (EZ) countries that follow the monetary policies set forth by the European Central Bank (ECB). Currency unions like the European Economic and Monetary Union (EMU) are ideal when one wants to estimate such spillovers effects, because the countries operate under the same monetary rules, but have kept their fiscal policy decisions intact and decentralized.

Countries in the EMU exhibit an increased degree of interconnectedness. Interconnectedness is important and distinguishes between aspects of macroeconomic, market and credit risk. As markets become more complex, policy changes can rapidly transmit throughout the global system, with severe positive or negative consequences. The literature defines interconnectedness as a form of long-term relationships, as interdependence, or as a sudden, short-term increase in country linkages, due to a country (or group of countries) shock, known as contagion (Chen, 2018; Davidson, 2020). As the global financial crisis was unfolding, its severity highlighted the importance of interconnectedness as pivotal in understanding financial crises and their evolution. As a consequence of the above, the literature on sovereign bond markets interdependence has flourished.

Bond market contagion aims at examining how major economic disruptions can explain the movements that sovereign bond yields exhibit. A typical example that provides evidence on the determinants of yield spreads for the Asian market and developed countries can be found in Hilscher and Nosbusch (2010). On a similar note, Cabello (2019) investigates the bond yield determinants of Latin American countries. Another strand of the literature focuses on the co-movements in bond markets (Ahmad et al., 2018). Specifically, Ahmad et al. (2018) establish a connection between the countries that form BRICS (Brazil, Russia, India, China and South Africa) and global bond markets as represented by the USA, EMU and Japan. A final research strand

examines the effect of the capital inflow termination from developed to emerging economies (Konopczak and Konopczak, 2017; Reyes-Heroles and Tenorio, 2019) and analyzes the stock-bond interdependence framework (Sakemoto, 2018; Wang and Wang, 2018).

In order to assess the effects of QE on the economy, we consider eight different components of bank credit reported by monetary financial institutions (MFIs) under seven different channels of interconnectedness (the selection criteria and the construction of each channel are discussed further in Section 2.10). In this way, we model the effects of different subcomponents of bank credit through alternative interconnectedness channels, a procedure that adds to the robustness of our findings, while also reporting the total effect of the policy, which was our primary goal.

2.3 Is QE effective after all?

QE policies were implemented in economies around the world, with notable examples being the US, the UK, Japan and the EU. In the UK, QE had a diminishing effect on bank deposits, and as a result, lowered the effectiveness of the bank credit channel (Butt et al., 2014). On a similar note, Joyce and Spaltro (2014) found small and statistically significant bank credit growth in small and medium-sized banks. In addition, QE impacted asset prices through portfolio rebalancing mechanisms and affected long-term government bond yields in the UK (Joyce et al., 2012), as well as in the US (Gagnon et al., 2011). Moreover, a decrease in capitalization seemed to decrease the impact of QE on bank credit in the UK, as it reduced the cost of bank funding and increased their willingness to provide loans (Churm et al., 2015).

Additional studies regarding the effectiveness of QE programs found evidence of reduced bank funding volatility in the EU and the US, and an increased supply of loans (Carpenter et al., 2014).

Regarding other positive developments, Anaya et al. (2017) reported a lower level of lending rates, and Barroso et al. (2016) described substantial credit growth in Brazil.

Turning our attention to the EU, the European Central Bank QE policies have led to an increase in stock market liquidity in Germany, France and Italy (Fernández et al., 2011). Similar positive conclusions can be found in Casiraghi et al. (2013), who provided evidence in favor of ECB's QE policies by showing that they led to an increased credit supply in Italy. As for the long-term refinancing operations (LTROs) implemented by the ECB, evidence suggests that they had a positive effect in (lowering) lending rate spreads (Darracq-Paries and De Santis, 2015). Regarding very long-term refinancing operations (VLTROs), researchers have found only modest positive effects on the level of bank credit that firms can access in Spain, and have reported that the results are driven mainly by credit to smaller and medium enterprises (Garcia-Posada and Marchetti, 2016). They conclude that this effect was more pronounced for illiquid banks.

2.4 Unconventional measures deployed by the ECB

September of 2014 was a pivotal moment for the ECB. After six years of unsuccessful attempts to regain investor confidence (Driffill, 2016), the ECB officially announced the unconventional stimulation package of sovereign bond purchases. Although the ECB had previously utilized a number of unconventional monetary policy programs in order to boost liquidity, they were mostly deemed unsuccessful in practice, despite being welcomed by the market at the time of their announcement (Pattipeilohy et al., 2013). We proceed by highlighting these initial attempts below:

- Longer-term refinancing operations (LTROs) were used as a liquidity mechanism with a three-month maturity period. The program was designed to provide credit extensions to Eurozone banks, and was expanded to a maturity period of up to one year.

- Covered bond purchase programs (CBPP): the ECB ran three different instances of this type of asset purchase program. The first one was launched in June 2010 and reached EUR 60 billion in purchases, the second one ran from November 2011 to October 2012 and reached EUR 16.4 billion in purchases, while the third one was announced on February 2020. The first two programs were a precursor to the public sector purchase program.
- Securities market program (SMP): the program was instated in 10 May 2010 and all Eurosystem central banks began security purchases in order to alleviate market tensions caused by the ineffectiveness of standard monetary policy transmissions mechanisms. The program was terminated in September 2012.
- Corporate sector purchase program (CSPP): this program was the first one to include corporate sector bond purchases. It ran from June 2016 to December 2018, and from January 2019, it entered its reinvestment period.
- Asset-backed securities purchase program (ABSPP): this program involved asset-backed securities purchases. It ran from November 2014 to December 2018, and from January 2019, it entered its reinvestment period.
- Public sector purchase program (PSPP): the main tool for expressing the unconventional monetary policy of the ECB. It involved the acquisition of two types of bonds. These were central government bonds from eligible EMU countries and bonds issued by a number of different types of international organizations and agencies. The program ran its course from March 2015 to December 2018. By the end of the program, 90% of all purchases could be traced back to this specific program. Figure 2.1 provides the cumulative holdings of each program for the period 2014–2020.

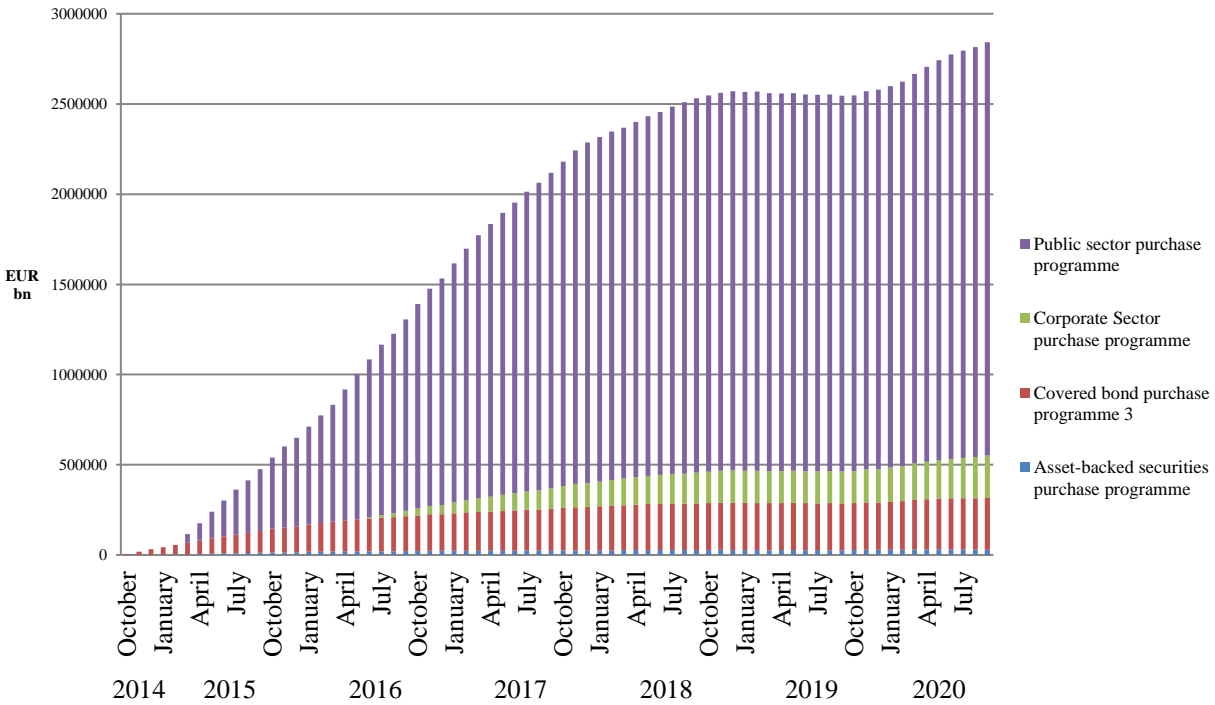
Regarding the maximum allowed purchases through the PSPP, the ECB adjusted the ceiling on the following dates:

- ❖ March 2015–March 2016, EUR 60 billion;
- ❖ April 2016–March 2017, from EUR 80 billion;
- ❖ April 2017–December 2017, EUR 60 billion;
- ❖ January 2018–September 2018, EUR 30 billion;
- ❖ October 2018–December 2018, EUR 15 billion.

Purchases were seized for a period of nine months (January to September 2019) and the program restarted with a maximum allowed number of purchases set at EUR 20 billion. While most of the literature considers only announcements, recent papers have highlighted the importance of actual purchases as well. This can be attributed to the fact that actual purchases caused a disruption in market anticipation, since market participants were surprised by the size of the EMU's QE and its extensive period of implementation (Georgiadis and Gräßl 2016; De Santis 2020)⁶.

⁶ The market expected the total volume of purchases to be around the EUR 500–700 billion mark, according to a 2014 Reuter's poll. Actual program purchases are reported in Figure 2.1 and are five-fold what the market anticipated amount was.

Figure 2.1 PSPP cumulative holdings.



Source: ECB website

2.5 Methodology

We consider a space–time dynamic spatial panel model, which is robust to possible non-stationarity⁷, differences in slope heterogeneity and cross-sectional dependence of variables⁸. These are common problems in macroeconomic panel data with a relatively large dimension of cross-sectional and time observations. The spatial nature of our econometric approach allows for the use of multiple interaction matrices, with each matrix providing information through a different mechanism of connectedness. The flexibility of this approach enables the calculation of the real

⁷ The stationarity of all series was tested using the tests proposed by Levin et al., (2002) and Im et al., (2003). The corresponding results, which are available upon request, indicate that all series are stationary.

⁸ For a more thorough treatment, see Chudik and Pesaran (2015), who rely on estimating an ARDL model, which appropriately filters out unobserved common factors.

impact (both direct and indirect), and helps when measuring the international risk attached to a highly interconnected economy, such as the countries that are a part of the Eurozone.

2.6 Event Study

Event studies analyze the impact of key monetary policy announcements and their effect on variables of interest. The most frequent variable examined in the literature is bond yields, and examples of such event studies on QE include Krishnamurthy and Vissing-Jorgensen (2011) and Gagnon et al. (2010). They all base their respective approaches on the three criteria proposed: (i) efficient markets; (ii) non-existent compounding factors; and (iii) the urgency of the event (Fama et al., 1969).

To combat the effects of possibly amplified market inefficiencies in times of financial distress, we adopt a multi-month event methodology. Multi-month events take into consideration the possibility of non-instantaneous responses to key policy announcements. Such examples can be found in Krishnamurthy and Vissing Jorgensen (2011) and Gagnon et al. (2010), who use multiple event windows. This way, it is possible to test one of our null hypotheses, that QE announcements have a statistically significant impact on bank credit. The way we test this hypothesis is by creating two dummy variables, one a month prior to the announcement and a second one a month after the announcement. Table 2.10 contains all the announcements considered in our analysis.

2.7 Specification and Interpretation

The main specification of this paper can be categorized as part of the broad class of spatial econometrics models that study macroeconomic phenomena (Debary et al., 2018). The purpose of these models is to consider the possibility of cross-sectional dependence among observations (LeSage and Pace, 2009). Equation (1) describes the estimated model in depth.

Spatial autoregressive models (SARs) have contributed to the literature by accounting not only for direct, but also indirect impacts (specifically, the impact that a change on bank credit in country j had on the bank credit of country i). The ability to account for the indirect effects is a necessity for policymakers as it enables them to distinguish local effects (the effect of the policy in the country of origin) from global effects (how effective it is on the rest of the countries in the sample). With this in mind, this approach allows us to account for the impact of a change in EU monetary policy on a single EU country as well as accounting for the impact of the policy on the rest of the Union. As such, indirect effects may show how susceptible the bank credit channel of one country is to changes in the determinants of other countries (in short, how exposed the country is to the rest of the sample, or to international exposure), or the impact (risks) of a country due to international spillovers. The main estimated model can be written as follows:

$$\begin{aligned}
mfi_{it} = & \tau mfi_{it-1} + \psi \sum_{j=1}^N \widehat{w}_{ij} mfi_{jt-1} + \rho \sum_{j=1}^N \widehat{w}_{ij} mfi_{jt} + \beta_1 VIX_t + \beta_2 IPI_{it} \\
& + \beta_3 UMP_AN_{it} + \beta_4 CMP_AN_{it} + \beta_5 PSPP_{it} + \beta_6 MPI_{it} + \beta_7 LIBOR_t \\
& + \beta_8 BOND_YIELDS_{it} + \beta_9 HICP_t + \beta_{10} ZLB_{it} + \mu_i + \varepsilon_{it}
\end{aligned} \tag{1}$$

where the cross-sections are $i = 1, \dots, N$ and the time is $t = 1, \dots, T$. Moreover, \widehat{w}_{ij} represents the row standardized weighting matrix, which we further define in Section 2.10. β indicates the estimated coefficients, mfi is the bank credit channel, VIX signifies the Chicago Board Options Exchange (CBOE) volatility index, IPI represents the level of industrial production, UMP_AN are the unconventional monetary policy announcements, CMP_AN denotes the conventional monetary policy announcements, MPI is the monetary policy index, $PSPP$ indicates the main QE purchase

program, *LIBOR* represents the rate of the six-month interbank LIBOR rate, *BOND_YIELDS* are the reported 10-year government bond yields, *ZLB* is a dummy that indicates the zero lower bound period and *HICP* indicates inflation.

2.8 Data

To model the bank credit channel (dependent variable), we include eight different dependent variables and ten independent variables (the descriptive statistics for all the variables are reported in Table 2.1) spanning from May 2007 to December 2018⁹. These are loans that were given to Eurozone residents by monetary financial institutions (MFIs). The source for the data is the Thomson Reuters DataStream database, and includes the following:

- The total number of loans that MFIs provided to EZ residents (Figure 2.2);
- MFI loans to central EZ governments (Figure 2.3);
- MFI loans to stimulate consumer credit (Figure 2.4);
- MFI loans to consumers for household purchases (Figure 2.5);
- MFI loans to consumers, excluding credit for house purchases (Figure 2.6);
- MFI loans to insurance corporations and pension funds (Figure 2.7);
- MFI loans to other financial intermediaries (Figure 2.8);
- Other MFI loans to EZ residents (Figure 2.9).

Table 2.9 shows the countries considered in the model. With regard to the independent variables (sources can be found in Table 2.15), we include the following.

⁹ We do not consider announcements and purchases after the end of 2018, as the PSPP program entered its reinvestment period and the results would be contaminated.

VIX

The CBOE VIX index is used as a way to capture global risk aversion as it represents volatility. This index captures economic uncertainty and economic growth, and some consider it as an index representing the fear of the global economy. Including this variable in the model helps with controlling credit increases as a response to the increased volatility of the market. The variable is stationary according to the appropriate tests.

Bond Yields

Bond yields represent the risk-free rate of each economy in the sample. The typical choice in the literature to best represent this is the 10-year sovereign bond yield. The theory behind choosing government bond yields is that, as yields decrease, credit should increase. Unit root tests find stationarity in the panel series.

Industrial Production Index

This index serves as a way to account for the positive effects that an economy may experience. This is because, in times of a booming economy, credit will increase, and as a result, production will follow. After the introduction of QE measures, it is important to control for the possibility of such a boom to the economy. All tests indicate that the variable is stationary.

HICP

Inflation reflects the price level and can be associated with an increased level of interest rates, as described by Égert et al. (2007). Control for inflation was, at the time, a specific mandate of the ECB (staying close to the 2% mark). We consider this variable to be stationary.

UMP Announcements

A dummy that takes the value of 1 if a month has an unconventional policy announcement, and 0 if no announcement was made. This variable allows us to track the effect of unconventional monetary policy announcements. The dates included can be found in Table 2.10.

CMP Announcements

A dummy that takes the value of 1 if a month has conventional policy announcement, and 0 if no announcement was made. Using this, we can track the effect of conventional monetary policy announcements. The dates considered in our estimations can be found in Table 2.11.

Zero Lower Bound

This variable is in line with Martins et al. (2019), and considers the zero lower bound period that the EMU experienced. It takes the value of 1 for the period from February 2012 to December 2018, and 0 otherwise. Controlling for this specific period is important, since credit lines were severely affected over the control period.

PSPP

Monthly purchases during the ECB's QE era for each country. As purchases increased, credit should also have increased, due to excess liquidity in the market. Even though the literature has indicated that actual purchases do not play an important role, recent developments contest this view, and as such, considering the amount of purchases for each month is important for our estimations.

Monetary Policy Index

An index based on Google Trends. This is a search query that takes into account the search volume of specific words and is used in the literature as a way to obtain monetary policy attention and anticipation. The index takes values from 0 (no search volume) to 100 (the largest number of searches). It is expected that during the announcement of the ECB's QE, the index will have its largest reported value for the majority of the sample, due to the publicity that QE gathered as a policy at the time. The keywords can be found in Table 2.12 and are in line with Wohlfarth (2017).

LIBOR

The interbank rate used to calculate the interest rate charge on short-term loans. In our analysis, we consider the six-month LIBOR rate, and all tests indicate the stationarity of the series.

Table 2.1: Descriptive Statistics

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>S.D.</i>	<i>Min</i>	<i>Max</i>
MFI Total	2520	0.0005	0.0099	-0.0929	0.0872
MFI Government	2520	-0.0001	0.0424	-0.7185	0.5533
MFI Pension Funds	2520	-0.0019	0.2135	-2.8708	2.7873
MFI Households (excluding House Purchases)	2520	-0.0003	0.0190	-0.2772	0.7354
MFI Households (including House Purchases)	2520	0.0014	0.0057	-0.0945	0.0705
MFI Consumer Credit	2520	0.0004	0.0104	-0.1535	0.1908
MFI Other Organizations	2520	0.0006	0.0059	-0.0731	0.1282
MFI Financial Intermediaries	2520	0.0015	0.0348	-0.5139	0.3504
VIX	2520	0.0295	0.2463	-0.3849	1.3457
Bond Yields	2520	0.0336	0.0292	-0.0015	0.2924
Industrial Production Index	2520	2.0013	0.0605	1.7243	2.1827
HICP	2520	0.0171	0.0205	-0.0430	0.1770
CMP Announcements	2520	0.1286	0.3348	0.000	1.000
Zero Lower Bound	2520	0.5929	0.4914	0.000	1.000
UMP Announcements (+1)	2520	0.2500	0.4331	0.000	1.000
PSPP	2520	0.8046	1.3495	0.000	4.292

6 Month LIBOR	2520	0.9602	1.5520	-0.331	5.214
UMP Announcements (-1)	2520	0.2571	0.4371	0.000	1.000
Monetary Policy Index	2520	3.1613	0.6869	0.000	4.605

Notes: *Dependent variables:* MFI Total, MFI Government, MFI Pension Funds, MFI Credit excluding House Purchases, MFI Credit including House Purchases, MFI for Consumer Credit, MFI Credit to Other Organizations, MFI Credit to Financial Intermediaries.

Independent Variables: VIX, Bond Yields, Industrial Production Index, HICP, CMP Announcements, Zero Lower Bound, UMP Announcements (+1), PSPP, 6 Month LIBOR, UMP Announcements (-1), Monetary Policy Index

2.9 Linkages

One important dimension of the spatial econometric approach is the correct definition of the weighting matrix. This matrix is specified a priori by the researcher and its structure is based on the dependence of observations. The vast majority of the literature assumes geographical distance between countries as the most important factor that shapes the degree in which each country interacts with its linkages.

We depart from the geographic-only approach and specify different types of matrices that can better capture interactions across EMU countries. When creating the matrices, the researcher should take into account more than one mechanism of transmission (to avoid possible bias that certain interconnectedness mechanisms may exhibit and/or for robustness of results). The exact number that should be considered is not specified in the literature, hence it is the task of the researcher to decide on a number that is acceptable for the situation. Since QE works through multiple different channels, capturing its effects is not easy, so taking into account as many transmission mechanisms as possible is the appropriate way to model its effects. To this end, we construct the following seven mechanisms of interconnectedness: trade intensity, portfolio holdings, foreign direct investment, social proximity, debt similarity, deficit similarity and investment credit rating. The choice of these mechanisms was based on two criteria: the first one

was prior examples in the literature; and the second was based on the nature of QE and how it should affect bank credit.

2.10 Matrix selection and construction

This section provides a description of the selected interconnectedness mechanisms and their definitions across all sovereign entities¹⁰. It should be noted that all matrices are averaged over the period of the sample (2007–2018). Table 2.14 in the Appendix provides all the necessary information regarding the data source and time period for each specified matrix.

Trade intensity

The first linkage matrix reflects the trade intensity between countries and is calculated based on Equation (2), which includes the volume of exports and imports from country i to country j . This matrix, unlike others, is an asymmetric distance matrix, as the intensity of exports and imports between countries differs. Higher values between countries indicate an increased degree of trade integration, and as a result, a higher degree of interaction among economies (Figure 2.2). The choice of this measure of integration is based on the Frankel and Rose (1996) argument that economies which trade intensively have synchronized business cycles and hence similar credit cycle behavior. Data for the matrix can be found in the World Trade Organization (WTO) database, and they include the volume of bilateral exports and imports between a set of countries.

$$W_{ij,t}^{Trade} = \frac{X_{ij,t} + M_{ji,t}}{GDP_{i,t} + GDP_{j,t}} \quad (2)$$

¹⁰ A final transmission mechanism that we wanted to consider was bank exposure. Even though this integration measure would be appropriate, taking it into account was not possible due to data unavailability from the European Banking Authority Transparency Exercise.

where $W_{ij,t}^{Trade}$ is the value of total trade between country i to country j , $X_{ij,t}$ denotes bilateral exports and $M_{ji,t}$ represents bilateral imports. To avoid overestimating the effects of larger neighboring economies, we GDP normalize to the measure of proximity.

Portfolio holdings

Kodres and Pritsker (2002) argue that investors adjust their portfolios in markets that are exposed to shocks in other markets, thus the closer you are to the shock, the more likely it is for you to adjust your portfolio (Figure 2.6). To construct this matrix, we extract data from the IMF's Coordinated Portfolio Investment Survey. Specifically, we consider total bilateral portfolio holdings from country i to country j .

Foreign direct investment

Foreign direct investment (FDI) as a linkage mechanism (Figure 2.8) is appropriate to capture country dependence, as it can provide the degree to which countries form direct, stable and long-lasting economic links (Equation 3). Countries with a larger degree of bilateral FDI flows are more exposed to exogenous shocks, such as QE, than countries with smaller FDI flows. In the literature, few empirical studies have investigated FDI and bank credit. Such studies include one by Saini and Law (2010), who found a positive impact of FDI on growth through a threshold regression model. To calculate the bilateral FDI matrix, we use Equation (3), which is inspired by Fernández-Avilés et al. (2012):

$$W_{ij,t}^{FDI} = 2 - \left(\frac{outwardFDI_{ij,t}}{GDP_{i,t}} + \frac{outwardFDI_{ji,t}}{GDP_{j,t}} \right) \quad (3)$$

where $W_{ij,t}^{FDI}$ is the value of total FDI flows between country i to country j , $outwardFDI_{ij,t}$ denotes the FDI flows from country i to country j , while $outward FDI_{ji,t}$ denotes FDI flows from country j to country i .

Social proximity

We consider a measure of social proximity (Figure 2.7) through the socioeconomic stability matrix (Equation 4). This matrix accounts for the ability of sovereign governments to carry out their agendas and to stay in office while securing a level of political stability, as political stability is closely related to the level of risk that lenders are willing to take (Brewer and Rivoli, 1990). All data are from the International Country Risk Guide (ICRG) database and account for the difference between institutional similarities¹¹. All indices are summed up and then calculated to the final matrix using Equation (4).

Debt and Deficit similarity

Macroeconomic fundamentals are used by investors as an information mechanism to account for the similarities between countries (Figures 2.3 and 2.4). Similar countries are expected to be the recipients of similar credit injections (e.g., it is more probable for a person in Austria to invest in Germany than in Greece). Debt-to-GDP and deficit-to-GDP ratios are typical macroeconomic indicators that account for this type of proximity, and were previously used in the literature by Favero (2013). To calculate the final matrix, we use Equation (4).

¹¹ The matrix is the sum of six indices published by ICRG and include voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption.

Investment credit rating

The degree of similarity across countries regarding their investment grade can severely impact market liquidity (Afonso, Furceri and Gomes, 2011). Countries with similar investment ratings should be affected by QE in a similar capacity. As a result, they should be able to secure more liquidity and be less affected by downgrades (Figure 2.5). To construct this matrix, we utilize Equation (4). Countries with the same investment rating are closer to countries that have the same rating:

$$W_{ij,t}^l = \frac{1}{|A_{i,t}^l - A_{j,t}^l| + 1}, \quad l = 1, \dots, 4 \quad (4)$$

where $W_{ij,t}^l$ is the distance matrix used in the estimation (social proximity, debt and deficit similarity or investment credit rating), $A_{i,t}^l$ denotes the value of the characteristic (debt/deficit/social similarity/credit rating) in country i and $A_{j,t}^l$ represents the value of the characteristic in country j . The transformation from the typical credit rating scale to a linear one is found in Table 2.13 in the Appendix.

This article aims to uncover the long-term effect of unconventional monetary policy on bank credit. This section examines the way that our findings complement the literature and sheds light on the implications of the policy. Tables 2.2 through 2.8 report the results of the estimations for the total amount of loans issued by MFIs. More specifically, they capture the short- and long-term direct and indirect effects of unconventional monetary policy, and present the results of our main model. We find that QE managed to affect credit through all the different interconnected mechanisms considered.

The results in Table 2.2 indicate that unconventional monetary policies had a positive effect on the total amount of MFI loans (credit). More specifically, unconventional announcements and purchases of the PSPP program increased the total amount of available credit one month before the initial announcement of the policies. Meanwhile, conventional announcements do not produce any significant impact on credit, indicating their inability to impact monetary policy. Regarding the monetary policy index, which captures monetary policy anticipation, its negative sign in all estimations indicates that the policies were implemented late (negative market sentiment), something that coincides with the critiques of the ECB. This index is significant in most specifications and provides a measure of anticipation of the agents regarding the timing of implementation, while indicating that the late implementation of unconventional ECB policies affected not only individual countries, but each country also affected its main trading partners (neighbors). The results are homogenous across all transmission mechanisms considered, and the spillover effects of monetary policy (both direct and indirect) are statistically significant. This indicates that, while conventional policy failed to secure system stability, unconventional policies not only have a positive effect, but can also result in significant feedback effects that are traced across the monetary union. Policymakers should note this, as it can lead to inflation overshooting its target range, something that is particularly important now that the policy has been revived by the ECB to combat the effects of COVID-19.

Credit to governments (Table 2.16 of the Appendix) seems to follow a similar trajectory as total bank credit, with the exception that purchases seem to have a negative effect on loans. This is counterintuitive at first sight, but can be traced back to the stricter fiscal policies that EZ countries adopted during this period.

Pension fund (Table 2.17 of the Appendix) loans are unaffected by unconventional policies, and is the only channel that seems to be affected (negatively) by conventional policy announcements. This can be attributed to the fact that pension funds are risk averse and tend to not change their investment decisions in the short term, as pension fund trustees prefer a more conservative portfolio strategy asset allocation (Davis, 2001).

The rest of the specifications (Tables 2.18 to 2.22 of the Appendix) indicate that, even though conventional announcements impact subcomponents of credit (credit to households excluding credit for house purchase, credit to households for house purchase and consumer credit) and exhibit a statistically significant relationship, the total effect of conventional policies is not enough to stimulate credit lines. Meanwhile, even though unconventional announcements do not seem to impact individual credit channels (except for “government credit”, a channel that they were designed to impact), their total impact indicates that they do have a positive effect on stimulating credit lines.

As a concluding remark, the results of the paper highlight the stimulating effects of QE on European macroeconomic fundamentals through the bank credit channel, both in a direct and indirect way (spillover effects). Specifically, QE has had a positive effect on loan supply, thus leading banks to lowering their lending criteria and improving liquidity in a time of increased financial stress. This comes as a late response to deteriorating credit lines in the banking sector, and even though the implementation was late, the QE shock helped to resuscitate the Eurozone area during a crisis period (something that the monetary policy index highlights). Overall, our results indicate that making swift and decisive monetary policy decisions is crucial and needs to be pursued in periods of elevated financial stress. Thus, more relaxed monetary policy measures in times of stress could provide enough stimulation to the market and significantly alleviate

deteriorating macroeconomic conditions. This has been particularly important in recent times, as the COVID-19 crisis has led to an increase in market fear regarding a possible inability to secure enough credit, because the severity of a health crisis in a country is correlated with the weakening of bank credit conditions (Çolak and Öztekin, 2021).

Table 2.2: Total Bank Credit to MFI's and Unconventional Monetary Policy effects (Main Estimation)

Interaction Matrix (W): Independent Variables	Dependent variable MFI Total													
	Trade	Portfolio	Credit	Socioeconomic	FDI	Debt to GDP	Deficit to GDP							
L. MFI Total	-0.150*** (0.0377)	-0.149*** (0.0385)	-0.158*** (0.0356)	-0.157*** (0.0365)	-0.159*** (0.0364)	-0.159*** (0.0374)	-0.159*** (0.0355)	-0.159*** (0.0366)	-0.158*** (0.0354)	-0.159*** (0.0365)	-0.158*** (0.0355)	-0.158*** (0.0367)	-0.158*** (0.0361)	-0.159*** (0.0374)
L.W MFI Total	0.0806 (0.0529)	0.0787 (0.0533)	0.149*** (0.0416)	0.144*** (0.0427)	0.147*** (0.0469)	0.146*** (0.0474)	0.201*** (0.0520)	0.202*** (0.0530)	0.208*** (0.0499)	0.207*** (0.0509)	0.199*** (0.0494)	0.199*** (0.0500)	0.212*** (0.0490)	0.213*** (0.0503)
VIX	0.00242*** (0.000896)	0.00220*** (0.000848)	0.00220*** (0.000848)	0.00196** (0.000811)	0.00209** (0.000848)	0.00185** (0.000803)	0.00235*** (0.000837)	0.00208*** (0.000791)	0.00242*** (0.000841)	0.00213*** (0.000794)	0.00241*** (0.000841)	0.00213*** (0.000793)	0.00245*** (0.000822)	0.00216*** (0.000772)
Industrial Production Index	0.0192*** (0.00734)	0.0189*** (0.00724)	0.0209*** (0.00736)	0.0206*** (0.00725)	0.0209*** (0.00719)	0.0207*** (0.00707)	0.0215*** (0.00748)	0.0212*** (0.00734)	0.0216*** (0.00750)	0.0213*** (0.00735)	0.0218*** (0.00729)	0.0215*** (0.00715)	0.0222*** (0.00745)	0.0219*** (0.00730)
UMP Announcements (-1)	0.00115** (0.000483)		0.00106** (0.000433)		0.00115** (0.000472)		0.00122** (0.000486)		0.00126** (0.000489)		0.00125** (0.000492)		0.00128*** (0.000493)	
UMP Announcements (+1)		0.000440 (0.000382)		0.000295 (0.000396)		0.000461 (0.000384)		0.000511 (0.000403)		0.000526 (0.000405)		0.000525 (0.000400)		0.000532 (0.000389)
CMP Announcements	-0.000176 (0.000522)	-0.000353 (0.000524)	-0.000101 (0.000536)	-0.000235 (0.000548)	-0.000134 (0.000556)	-0.000307 (0.000565)	-0.000188 (0.000565)	-0.000370 (0.000581)	-0.000206 (0.000562)	-0.000393 (0.000579)	-0.000219 (0.000561)	-0.000406 (0.000574)	-0.000221 (0.000553)	-0.000413 (0.000564)
PSPP	0.000279** (0.000124)	0.000298** (0.000127)	0.000273** (0.000133)	0.000291** (0.000135)	0.000198 (0.000123)	0.000213* (0.000127)	0.000249* (0.000127)	0.000262** (0.000131)	0.000255** (0.000127)	0.000268** (0.000130)	0.000260** (0.000128)	0.000273** (0.000131)	0.000278** (0.000129)	0.000293** (0.000133)
Monetary Policy Index	-0.00119** (0.000490)	-0.00114** (0.000500)	-0.00138*** (0.000483)	-0.00134*** (0.000488)	-0.00120** (0.000497)	-0.00115** (0.000505)	-0.00119** (0.000507)	-0.00114** (0.000516)	-0.00119** (0.000509)	-0.00114** (0.000517)	-0.00121** (0.000507)	-0.00115** (0.000516)	-0.00119** (0.000516)	-0.00114** (0.000525)
6 Month LIBOR	-0.000454 (0.000673)	-0.000265 (0.000697)	-0.000586 (0.000668)	-0.000444 (0.000692)	-0.000561 (0.000689)	-0.000370 (0.000709)	-0.000440 (0.000679)	-0.000230 (0.000706)	-0.000445 (0.000678)	-0.000229 (0.000705)	-0.000434 (0.000680)	-0.000218 (0.000705)	-0.000423 (0.000684)	-0.000201 (0.000708)
Bond Yields	-0.0291*** (0.0112)	-0.0289*** (0.0112)	-0.0283*** (0.0107)	-0.0281*** (0.0107)	-0.0280*** (0.0102)	-0.0277*** (0.0102)	-0.0286*** (0.0105)	-0.0283*** (0.0105)	-0.0288*** (0.0105)	-0.0285*** (0.0105)	-0.0287*** (0.0104)	-0.0284*** (0.0104)	-0.0274*** (0.0103)	-0.0270*** (0.0103)
HICP	0.0212 (0.0135)	0.0207 (0.0134)	0.0222* (0.0116)	0.0214* (0.0116)	0.0199* (0.0108)	0.0193* (0.0108)	0.0225** (0.0111)	0.0218** (0.0111)	0.0229** (0.0111)	0.0222** (0.0111)	0.0233** (0.0112)	0.0226** (0.0112)	0.0227** (0.0112)	0.0220** (0.0112)
Zero Lower Bound	-0.00263*** (0.000616)	-0.00260*** (0.000611)	-0.00268*** (0.000591)	-0.00264*** (0.000584)	-0.00228*** (0.000583)	-0.00223*** (0.000575)	-0.00230*** (0.000573)	-0.00224*** (0.000569)	-0.00234*** (0.000569)	-0.00227*** (0.000565)	-0.00234*** (0.000583)	-0.00228*** (0.000578)	-0.00238*** (0.000562)	-0.00232*** (0.000556)
ρ	0.313*** (0.0410)	8.46e-05*** (1.53e-05)	0.268*** (0.0655)	0.281*** (0.0670)	0.304*** (0.0415)	0.312*** (0.0430)	0.218*** (0.0404)	0.232*** (0.0419)	0.196*** (0.0398)	0.210*** (0.0413)	8.91e-05*** (1.55e-05)	-0.00228*** (0.000578)	8.91e-05*** (1.56e-05)	0.189*** (0.0330)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Log-L	8167.2257	8164.2131	8133.1614	8130.5658	8139.0906	8136.2284	8123.7281	8120.6685	8121.8799	8118.6398	8121.6711	8118.4774	8121.9277	8118.5328
No. of countries/ observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.3043	0.2861	0.0007	0.0007	0.5936	-0.0357	0.4453	0.4514	0.3687	0.3813	0.3900	0.3802	0.5950	0.5491

Notes: MFI Total = Total Value of loans from MFI's in growth rates (log differences); L. MFI Total = the first lag of MFI Total; L.W MFI Total = the first spatial lag of MFI Total; VIX: CBOE Volatility index; UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; 6 Month LIBOR: Interbank 6 month Libor Rate; Bond Yields: 10-year Government Bond Yields; HICP: Harmonized Consumer Price Index (Inflation); Zero Lower Bound: A dummy variable that tracks a specific time period, where government bond yields were close to 0; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.3: Total Bank Credit to MFI's and Unconventional Monetary Policy effects (Short-run direct effects)

Interaction Matrix (W):	Dependent variable MFI Total													
	Trade	Portfolio	Credit	Socioeconomic	FDI	Debt to GDP	Deficit to GDP							
Independent Variables														
VIX	0.00250*** (0.000851)	0.00227*** (0.000807)	0.00224*** (0.000795)	0.00200*** (0.000760)	0.00214*** (0.000798)	0.00189** (0.000756)	0.00239*** (0.000787)	0.00211*** (0.000743)	0.00245*** (0.000790)	0.00216*** (0.000745)	0.00244*** (0.000790)	0.00216*** (0.000745)	0.00248*** (0.000770)	0.00219*** (0.000723)
Industrial Production Index	0.0193** (0.00752)	0.0190** (0.00742)	0.0207*** (0.00737)	0.0204*** (0.00727)	0.0209*** (0.00720)	0.0206*** (0.00709)	0.0213*** (0.00742)	0.0209*** (0.00730)	0.0214*** (0.00743)	0.0210*** (0.00730)	0.0216*** (0.00726)	0.0212*** (0.00712)	0.0220*** (0.00737)	0.0216*** (0.00724)
UMP Announcements (-1)	0.00119** (0.000491)		0.00108** (0.000441)		0.00118** (0.000478)		0.00124** (0.000491)		0.00128*** (0.000494)		0.00127** (0.000497)		0.00130*** (0.000496)	
UMP Announcements (+1)		0.000459 (0.000410)		0.000308 (0.000419)		0.000477 (0.000408)		0.000525 (0.000423)		0.000540 (0.000424)		0.000538 (0.000421)		0.000545 (0.000409)
CMP Announcements	-0.000180 (0.000511)	-0.000372 (0.000523)	-0.000102 (0.000515)	-0.000250 (0.000539)	-0.000141 (0.000531)	-0.000325 (0.000548)	-0.000194 (0.000533)	-0.000386 (0.000559)	-0.000211 (0.000531)	-0.000409 (0.000558)	-0.000226 (0.000530)	-0.000422 (0.000553)	-0.000229 (0.000522)	-0.000429 (0.000541)
PSPP	0.000292** (0.000133)	0.000310** (0.000138)	0.000280** (0.000140)	0.000298** (0.000143)	0.000205 (0.000127)	0.000220* (0.000132)	0.000255* (0.000131)	0.000267** (0.000135)	0.000261** (0.000131)	0.000273** (0.000135)	0.000266** (0.000132)	0.000278** (0.000136)	0.000284** (0.000131)	0.000298** (0.000135)
Monetary Policy Index	-0.00123** (0.000508)	-0.00119** (0.000507)	-0.00141*** (0.000493)	-0.00138*** (0.000490)	-0.00124** (0.000509)	-0.00119** (0.000506)	-0.00122** (0.000519)	-0.00117** (0.000518)	-0.00122** (0.000521)	-0.00117** (0.000519)	-0.00123** (0.000519)	-0.00118** (0.000518)	-0.00122** (0.000531)	-0.00117** (0.000530)
6 Month LIBOR	-0.000445 (0.000685)	-0.000247 (0.000717)	-0.000570 (0.000675)	-0.000423 (0.000706)	-0.000548 (0.000709)	-0.000351 (0.000734)	-0.000421 (0.000693)	-0.000206 (0.000725)	-0.000426 (0.000692)	-0.000206 (0.000725)	-0.000415 (0.000694)	-0.000195 (0.000726)	-0.000404 (0.000694)	-0.000177 (0.000722)
Bond Yields	-0.0300*** (0.0116)	-0.0298*** (0.0115)	-0.0289*** (0.0111)	-0.0288*** (0.0110)	-0.0286*** (0.0105)	-0.0285*** (0.0104)	-0.0291*** (0.0108)	-0.0289*** (0.0107)	-0.0292*** (0.0107)	-0.0291*** (0.0106)	-0.0292*** (0.0107)	-0.0290*** (0.0106)	-0.0278*** (0.0106)	-0.0275*** (0.0105)
HICP	0.0214 (0.0135)	0.0209 (0.0135)	0.0220* (0.0117)	0.0214* (0.0118)	0.0198* (0.0109)	0.0194* (0.0109)	0.0223** (0.0111)	0.0218** (0.0111)	0.0227** (0.0111)	0.0221** (0.0111)	0.0230** (0.0112)	0.0225** (0.0112)	0.0225** (0.0112)	0.0219** (0.0111)
Zero Lower Bound	-0.00272*** (0.000604)	-0.00269*** (0.000605)	-0.00272*** (0.000583)	-0.00268*** (0.000577)	-0.00233*** (0.000569)	-0.00228*** (0.000565)	-0.00233*** (0.000562)	-0.00227*** (0.000560)	-0.00237*** (0.000557)	-0.00230*** (0.000556)	-0.00237*** (0.000574)	-0.00231*** (0.000573)	-0.00241*** (0.000546)	-0.00235*** (0.000545)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Log-L	8167.2257	8164.2131	8133.1614	8130.5658	8139.0906	8136.2284	8123.7281	8120.6685	8121.8799	8118.6398	8121.6711	8118.4774	8121.9277	8118.5328
No. of countries/ observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.3043	0.2861	0.0007	0.0007	0.5936	-0.0357	0.4453	0.4514	0.3687	0.3813	0.3900	0.3802	0.5950	0.5491

Notes: VIX: CBOE Volatility index; UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; 6 Month LIBOR: Interbank 6 month Libor Rate; Bond Yields: 10-year Government Bond Yields; HICP: Harmonized Consumer Price Index (Inflation); Zero Lower Bound: A dummy variable that tracks a specific time period, where government bond yields were close to 0; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses

Table 2.4: Total Bank Credit to MFI's and Unconventional Monetary Policy effects (Short-run indirect effects)

Interaction Matrix (W):	Dependent variable MFI Total													
	Trade	Portfolio	Credit	Socioeconomic	FDI	Debt to GDP	Deficit to GDP							
Independent Variables														
VIX	0.00105*** (0.000375)	0.000974*** (0.000354)	0.000813** (0.000381)	0.000758** (0.000359)	0.000901** (0.000364)	0.000822** (0.000345)	0.000660** (0.000265)	0.000625** (0.000256)	0.000591** (0.000236)	0.000564** (0.000229)	0.000589** (0.000232)	0.000563** (0.000227)	0.000521*** (0.000190)	0.000498*** (0.000188)
Industrial Production Index	0.00837** (0.00391)	0.00841** (0.00389)	0.00760** (0.00379)	0.00792** (0.00398)	0.00893** (0.00369)	0.00910** (0.00374)	0.00580** (0.00226)	0.00612*** (0.00237)	0.00508** (0.00198)	0.00541*** (0.00208)	0.00516*** (0.00199)	0.00550*** (0.00208)	0.00461*** (0.00175)	0.00490*** (0.00186)
UMP Announcements (-1)	0.000507** (0.000234)		0.000420 (0.000258)		0.000513** (0.000251)		0.000353* (0.000181)		0.000318* (0.000162)		0.000315** (0.000159)		0.000278** (0.000127)	
UMP Announcements (+1)		0.000198 (0.000186)		0.000123 (0.000181)		0.000208 (0.000188)		0.000152 (0.000133)		0.000137 (0.000117)		0.000139 (0.000118)		0.000123 (9.79e-05)
CMP Announcements	-6.52e-05 (0.000219)	-0.000149 (0.000228)	-4.29e-05 (0.000204)	-0.000103 (0.000236)	-5.84e-05 (0.000231)	-0.000140 (0.000251)	-5.84e-05 (0.000155)	-0.000117 (0.000178)	-5.59e-05 (0.000136)	-0.000110 (0.000158)	-6.01e-05 (0.000135)	-0.000114 (0.000156)	-5.49e-05 (0.000118)	-0.000103 (0.000134)
PSPP	0.000126** (6.34e-05)	0.000136** (6.72e-05)	9.72e-05* (5.24e-05)	0.000110* (5.83e-05)	8.77e-05 (5.73e-05)	9.73e-05 (6.35e-05)	6.91e-05* (3.76e-05)	7.81e-05* (4.29e-05)	6.18e-05* (3.33e-05)	7.06e-05* (3.83e-05)	6.31e-05* (3.31e-05)	7.18e-05* (3.79e-05)	5.81e-05** (2.66e-05)	6.61e-05** (3.06e-05)
Monetary Policy Index	-0.000516** (0.000219)	-0.000505** (0.000218)	-0.000492*** (0.000188)	-0.000507** (0.000199)	-0.000512** (0.000210)	-0.000510** (0.000214)	-0.000321** (0.000129)	-0.000331** (0.000136)	-0.000279** (0.000113)	-0.000290** (0.000121)	-0.000284** (0.000114)	-0.000296** (0.000121)	-0.000246** (9.85e-05)	-0.000254** (0.000106)
6 Month LIBOR	-0.000215 (0.000324)	-0.000133 (0.000334)	-0.000208 (0.000268)	-0.000164 (0.000303)	-0.000243 (0.000321)	-0.000167 (0.000347)	-0.000116 (0.000198)	-6.22e-05 (0.000226)	-0.000102 (0.000173)	-5.51e-05 (0.000200)	-9.83e-05 (0.000172)	-5.02e-05 (0.000198)	-8.10e-05 (0.000149)	-3.74e-05 (0.000171)
Bond Yields	-0.0125*** (0.00460)	-0.0126*** (0.00457)	-0.0105** (0.00533)	-0.0110** (0.00537)	-0.0120** (0.00475)	-0.0124** (0.00487)	-0.00819** (0.00386)	-0.00870** (0.00400)	-0.00722** (0.00347)	-0.00773** (0.00361)	-0.00716** (0.00333)	-0.00767** (0.00347)	-0.00597** (0.00277)	-0.00637** (0.00291)
HICP	0.00903 (0.00587)	0.00895 (0.00590)	0.00794 (0.00496)	0.00807 (0.00509)	0.00841* (0.00490)	0.00845* (0.00504)	0.00631* (0.00369)	0.00655* (0.00383)	0.00561* (0.00331)	0.00587* (0.00344)	0.00569* (0.00327)	0.00596* (0.00341)	0.00493* (0.00291)	0.00514* (0.00305)
Zero Lower Bound	-0.00115*** (0.000305)	-0.00116*** (0.000304)	-0.000988*** (0.000368)	-0.00103*** (0.000377)	-0.000985*** (0.000291)	-0.001000*** (0.000302)	-0.000647*** (0.000219)	-0.000675*** (0.000227)	-0.000575*** (0.000202)	-0.000606*** (0.000210)	-0.000574*** (0.000190)	-0.000604*** (0.000198)	-0.000509*** (0.000152)	-0.000534*** (0.000159)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Log-L	8167.2257	8164.2131	8133.1614	8130.5658	8139.0906	8136.2284	8123.7281	8120.6685	8121.8799	8118.6398	8121.6711	8118.4774	8121.9277	8118.5328
No. of countries/ observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.3043	0.2861	0.0007	0.0007	0.5936	-0.0357	0.4453	0.4514	0.3687	0.3813	0.3900	0.3802	0.5950	0.5491

Notes: VIX: CBOE Volatility index; UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; 6 Month LIBOR: Interbank 6 month Libor Rate; Bond Yields: 10-year Government Bond Yields; HICP: Harmonized Consumer Price Index (Inflation); Zero Lower Bound: A dummy variable that tracks a specific time period, where government bond yields were close to 0; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.5: Total Bank Credit to MFI's and Unconventional Monetary Policy effects (Short-run Total effects)

Interaction Matrix (W):	Dependent variable MFI Total													
	Trade		Portfolio		Credit		Socioeconomic		FDI		Debt to GDP		Deficit to GDP	
Independent Variables														
VIX	0.00356*** (0.00119)	0.00325*** (0.00113)	0.00305*** (0.00109)	0.00276*** (0.00105)	0.00304*** (0.00113)	0.00272** (0.00107)	0.00304*** (0.00101)	0.00274*** (0.000964)	0.00304*** (0.000983)	0.00273*** (0.000937)	0.00303*** (0.000984)	0.00272*** (0.000939)	0.00300*** (0.000925)	0.00269*** (0.000881)
Industrial Production Index	0.0277** (0.0112)	0.0274** (0.0111)	0.0283*** (0.0104)	0.0283*** (0.0105)	0.0298*** (0.0105)	0.0297*** (0.0105)	0.0271*** (0.00928)	0.0271*** (0.00925)	0.0264*** (0.00899)	0.0264*** (0.00896)	0.0267*** (0.00887)	0.0267*** (0.00883)	0.0266*** (0.00880)	0.0265*** (0.00877)
UMP Announcements (-1)	0.00170** (0.000710)		0.00150** (0.000674)		0.00169** (0.000714)		0.00159** (0.000657)		0.00159** (0.000639)		0.00158** (0.000641)		0.00158*** (0.000609)	
UMP Announcements (+1)		0.000658 (0.000592)		0.000431 (0.000592)		0.000685 (0.000590)		0.000677 (0.000550)		0.000677 (0.000535)		0.000677 (0.000534)		0.000668 (0.000502)
CMP Announcements	-0.000245 (0.000727)	-0.000521 (0.000747)	-0.000145 (0.000712)	-0.000353 (0.000764)	-0.000199 (0.000758)	-0.000465 (0.000795)	-0.000253 (0.000684)	-0.000504 (0.000732)	-0.000267 (0.000662)	-0.000519 (0.000710)	-0.000286 (0.000661)	-0.000536 (0.000704)	-0.000284 (0.000637)	-0.000532 (0.000671)
PSPP	0.000418** (0.000192)	0.000446** (0.000202)	0.000378** (0.000182)	0.000408** (0.000191)	0.000293 (0.000182)	0.000317* (0.000193)	0.000324** (0.000165)	0.000345** (0.000174)	0.000323** (0.000160)	0.000344** (0.000169)	0.000329** (0.000161)	0.000350** (0.000170)	0.000342** (0.000154)	0.000364** (0.000162)
Monetary Policy Index	-0.00175** (0.000710)	-0.00169** (0.000709)	-0.00190*** (0.000619)	-0.00189*** (0.000625)	-0.00175** (0.000700)	-0.00170** (0.000701)	-0.00154** (0.000629)	-0.00150** (0.000635)	-0.00149** (0.000615)	-0.00146** (0.000622)	-0.00151** (0.000616)	-0.00148** (0.000623)	-0.00146** (0.000615)	-0.00142** (0.000623)
6 Month LIBOR	-0.000659 (0.00100)	-0.000379 (0.00105)	-0.000778 (0.000926)	-0.000587 (0.000991)	-0.000791 (0.00102)	-0.000518 (0.00107)	-0.000537 (0.000885)	-0.000268 (0.000946)	-0.000528 (0.000859)	-0.000261 (0.000920)	-0.000514 (0.000861)	-0.000245 (0.000919)	-0.000485 (0.000839)	-0.000214 (0.000889)
Bond Yields	-0.0425*** (0.0158)	-0.0425*** (0.0157)	-0.0395** (0.0154)	-0.0398*** (0.0153)	-0.0407*** (0.0148)	-0.0409*** (0.0148)	-0.0373*** (0.0142)	-0.0376*** (0.0142)	-0.0365*** (0.0138)	-0.0368*** (0.0138)	-0.0363*** (0.0137)	-0.0366*** (0.0137)	-0.0338*** (0.0131)	-0.0339*** (0.0131)
HICP	0.0304 (0.0192)	0.0298 (0.0192)	0.0300* (0.0159)	0.0295* (0.0162)	0.0283* (0.0156)	0.0278* (0.0156)	0.0286** (0.0145)	0.0283* (0.0146)	0.0283** (0.0141)	0.0280** (0.0143)	0.0287** (0.0142)	0.0284** (0.0143)	0.0274** (0.0139)	0.0270* (0.0140)
Zero Lower Bound	-0.00387*** (0.000851)	-0.00385*** (0.000854)	-0.00371*** (0.000810)	-0.00371*** (0.000815)	-0.00331*** (0.000809)	-0.00328*** (0.000817)	-0.00298*** (0.000731)	-0.00295*** (0.000740)	-0.00294*** (0.000708)	-0.00291*** (0.000718)	-0.00295*** (0.000718)	-0.00291*** (0.000727)	-0.00292*** (0.000654)	-0.00288*** (0.000661)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Log-L	8167.2257	8164.2131	8133.1614	8130.5658	8139.0906	8136.2284	8123.7281	8120.6685	8121.8799	8118.6398	8121.6711	8118.4774	8121.9277	8118.5328
No. of countries/ observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.3043	0.2861	0.0007	0.0007	0.5936	-0.0357	0.4453	0.4514	0.3687	0.3813	0.3900	0.3802	0.5950	0.5491

Notes: VIX: CBOE Volatility index; UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; 6 Month LIBOR: Interbank 6 month Libor Rate; Bond Yields: 10-year Government Bond Yields; HICP: Harmonized Consumer Price Index (Inflation); Zero Lower Bound: A dummy variable that tracks a specific time period, where government bond yields were close to 0; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.6: Total Bank Credit to MFI's and Unconventional Monetary Policy effects (Long-run Direct effects)

Interaction Matrix (W):	Dependent variable MFI Total													
	Trade	Portfolio	Credit	Socioeconomic	FDI	Debt to GDP	Deficit to GDP							
Independent Variables														
VIX	0.00219*** (0.000744)	0.00199*** (0.000705)	0.00195*** (0.000691)	0.00174*** (0.000661)	0.00186*** (0.000694)	0.00165** (0.000657)	0.00207*** (0.000685)	0.00184*** (0.000647)	0.00213*** (0.000687)	0.00188*** (0.000648)	0.00212*** (0.000687)	0.00188*** (0.000648)	0.00215*** (0.000670)	0.00191*** (0.000629)
Industrial Production Index	0.0168** (0.00657)	0.0166** (0.00649)	0.0180*** (0.00641)	0.0178*** (0.00632)	0.0181*** (0.00626)	0.0179*** (0.00617)	0.0185*** (0.00645)	0.0182*** (0.00634)	0.0186*** (0.00646)	0.0183*** (0.00634)	0.0188*** (0.00631)	0.0185*** (0.00619)	0.0191*** (0.00641)	0.0188*** (0.00630)
UMP Announcements (-1)	0.00104** (0.000429)		0.000940** (0.000384)		0.00103** (0.000416)		0.00108** (0.000428)		0.00111*** (0.000430)		0.00110** (0.000433)		0.00113*** (0.000432)	
UMP Announcements (+1)		0.000402 (0.000358)		0.000268 (0.000365)		0.000415 (0.000355)		0.000456 (0.000368)		0.000470 (0.000369)		0.000468 (0.000367)		0.000475 (0.000356)
CMP Announcements	-0.000157 (0.000447)	-0.000325 (0.000457)	-8.89e-05 (0.000448)	-0.000217 (0.000469)	-0.000123 (0.000462)	-0.000283 (0.000477)	-0.000169 (0.000464)	-0.000336 (0.000487)	-0.000184 (0.000462)	-0.000356 (0.000486)	-0.000196 (0.000461)	-0.000367 (0.000481)	-0.000200 (0.000454)	-0.000374 (0.000471)
PSPP	0.000255** (0.000116)	0.000271** (0.000121)	0.000244** (0.000122)	0.000259** (0.000124)	0.000179 (0.000111)	0.000191* (0.000115)	0.000222* (0.000114)	0.000232** (0.000117)	0.000227** (0.000114)	0.000238** (0.000117)	0.000232** (0.000115)	0.000242** (0.000118)	0.000247** (0.000114)	0.000259** (0.000118)
Monetary Policy Index	-0.00108** (0.000444)	-0.00104** (0.000443)	-0.00123*** (0.000428)	-0.00120*** (0.000426)	-0.00107** (0.000443)	-0.00104** (0.000440)	-0.00106** (0.000451)	-0.00102** (0.000450)	-0.00106** (0.000452)	-0.00101** (0.000451)	-0.00107** (0.000451)	-0.00103** (0.000450)	-0.00106** (0.000461)	-0.00101** (0.000461)
6 Month LIBOR	-0.000388 (0.000598)	-0.000216 (0.000626)	-0.000496 (0.000587)	-0.000368 (0.000614)	-0.000477 (0.000616)	-0.000306 (0.000638)	-0.000366 (0.000603)	-0.000179 (0.000631)	-0.000371 (0.000602)	-0.000179 (0.000631)	-0.000361 (0.000604)	-0.000170 (0.000632)	-0.000351 (0.000604)	-0.000154 (0.000629)
Bond Yields	-0.0262*** (0.0102)	-0.0261*** (0.0100)	-0.0251*** (0.00964)	-0.0250*** (0.00955)	-0.0249*** (0.00915)	-0.0248*** (0.00907)	-0.0253*** (0.00937)	-0.0251*** (0.00928)	-0.0255*** (0.00936)	-0.0253*** (0.00927)	-0.0254*** (0.00934)	-0.0252*** (0.00925)	-0.0242*** (0.00922)	-0.0240*** (0.00913)
HICP	0.0187 (0.0118)	0.0182 (0.0118)	0.0191* (0.0101)	0.0186* (0.0102)	0.0173* (0.00950)	0.0168* (0.00944)	0.0194** (0.00963)	0.0189** (0.00964)	0.0197** (0.00965)	0.0192** (0.00966)	0.0200** (0.00972)	0.0196** (0.00971)	0.0196** (0.00973)	0.0191** (0.00971)
Zero Lower Bound	-0.00238*** (0.000528)	-0.00235*** (0.000528)	-0.00237*** (0.000507)	-0.00233*** (0.000501)	-0.00202*** (0.000495)	-0.00198*** (0.000492)	-0.00203*** (0.000489)	-0.00198*** (0.000487)	-0.00206*** (0.000485)	-0.00201*** (0.000484)	-0.00207*** (0.000499)	-0.00201*** (0.000498)	-0.00210*** (0.000475)	-0.00204*** (0.000474)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Log-L	8167.2257	8164.2131	8133.1614	8130.5658	8139.0906	8136.2284	8123.7281	8120.6685	8121.8799	8118.6398	8121.6711	8118.4774	8121.9277	8118.5328
No. of countries/ observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.3043	0.2861	0.0007	0.0007	0.5936	-0.0357	0.4453	0.4514	0.3687	0.3813	0.3900	0.3802	0.5950	0.5491

Notes: VIX: CBOE Volatility index; UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; 6 Month LIBOR: Interbank 6 month Libor Rate; Bond Yields: 10-year Government Bond Yields; HICP: Harmonized Consumer Price Index (Inflation); Zero Lower Bound: A dummy variable that tracks a specific time period, where government bond yields were close to 0; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the -xsmle- Stata command (Belotti et al., 2017). Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.7: Total Bank Credit to MFI's and Unconventional Monetary Policy effects (Long-run indirect effects)

Interaction Matrix (W):	Dependent variable MFI Total													
	Trade	Portfolio	Credit	Socioeconomic	FDI	Debt to GDP	Deficit to GDP							
Independent Variables														
VIX	0.00105*** (0.000362)	0.000957*** (0.000341)	0.00107** (0.000444)	0.000970** (0.000415)	0.00113*** (0.000436)	0.00102** (0.000414)	0.00115*** (0.000410)	0.00106*** (0.000396)	0.00111*** (0.000387)	0.00103*** (0.000373)	0.00107*** (0.000372)	0.000990*** (0.000361)	0.00105*** (0.000338)	0.000976*** (0.000332)
Industrial Production Index	0.00826** (0.00370)	0.00822** (0.00366)	0.00998** (0.00438)	0.0101** (0.00447)	0.0111*** (0.00431)	0.0112*** (0.00434)	0.0101*** (0.00359)	0.0104*** (0.00369)	0.00959*** (0.00335)	0.00988*** (0.00344)	0.00939*** (0.00324)	0.00969*** (0.00333)	0.00930*** (0.00316)	0.00961*** (0.00328)
UMP Announcements (-1)	0.000502** (0.000225)		0.000543* (0.000298)		0.000637** (0.000295)		0.000607** (0.000279)		0.000589** (0.000263)		0.000565** (0.000253)		0.000556** (0.000228)	
UMP Announcements (+1)		0.000195 (0.000180)		0.000155 (0.000222)		0.000257 (0.000228)		0.000260 (0.000218)		0.000251 (0.000205)		0.000245 (0.000199)		0.000241 (0.000185)
CMP Announcements	-6.65e-05 (0.000216)	-0.000149 (0.000223)	-5.45e-05 (0.000260)	-0.000129 (0.000288)	-7.33e-05 (0.000285)	-0.000174 (0.000306)	-9.84e-05 (0.000262)	-0.000197 (0.000291)	-0.000101 (0.000247)	-0.000197 (0.000275)	-0.000105 (0.000238)	-0.000198 (0.000264)	-0.000105 (0.000229)	-0.000197 (0.000251)
PSPP	0.000124** (6.09e-05)	0.000133** (6.40e-05)	0.000130** (6.49e-05)	0.000142** (6.98e-05)	0.000109 (6.97e-05)	0.000120 (7.60e-05)	0.000121* (6.25e-05)	0.000133* (6.90e-05)	0.000117** (5.89e-05)	0.000129** (6.52e-05)	0.000115** (5.72e-05)	0.000127** (6.32e-05)	0.000119** (5.24e-05)	0.000131** (5.79e-05)
Monetary Policy Index	-0.000512** (0.000213)	-0.000497** (0.000211)	-0.000656*** (0.000223)	-0.000654*** (0.000230)	-0.000642** (0.000257)	-0.000634** (0.000261)	-0.000568** (0.000222)	-0.000570** (0.000231)	-0.000535** (0.000211)	-0.000537** (0.000219)	-0.000524** (0.000205)	-0.000528** (0.000214)	-0.000505** (0.000201)	-0.000507** (0.000212)
6 Month LIBOR	-0.000208 (0.000313)	-0.000126 (0.000323)	-0.000273 (0.000339)	-0.000209 (0.000371)	-0.000300 (0.000392)	-0.000203 (0.000419)	-0.000201 (0.000337)	-0.000105 (0.000374)	-0.000192 (0.000317)	-9.91e-05 (0.000353)	-0.000180 (0.000306)	-8.87e-05 (0.000340)	-0.000167 (0.000295)	-7.56e-05 (0.000327)
Bond Yields	-0.0124*** (0.00453)	-0.0124*** (0.00447)	-0.0139** (0.00625)	-0.0141** (0.00617)	-0.0151*** (0.00569)	-0.0154*** (0.00579)	-0.0141** (0.00596)	-0.0147** (0.00609)	-0.0134** (0.00565)	-0.0139** (0.00578)	-0.0129** (0.00532)	-0.0134** (0.00546)	-0.0119** (0.00494)	-0.0124** (0.00510)
HICP	0.00895 (0.00574)	0.00880 (0.00574)	0.0105* (0.00606)	0.0103* (0.00612)	0.0105* (0.00596)	0.0105* (0.00607)	0.0109* (0.00588)	0.0110* (0.00604)	0.0104* (0.00558)	0.0106* (0.00573)	0.0102* (0.00539)	0.0104* (0.00555)	0.00976* (0.00526)	0.00993* (0.00544)
Zero Lower Bound	-0.00114*** (0.000283)	-0.00114*** (0.000281)	-0.00130*** (0.000393)	-0.00131*** (0.000396)	-0.00123*** (0.000334)	-0.00124*** (0.000344)	-0.00112*** (0.000318)	-0.00114*** (0.000328)	-0.00108*** (0.000304)	-0.00110*** (0.000314)	-0.00104*** (0.000286)	-0.00106*** (0.000295)	-0.00102*** (0.000249)	-0.00105*** (0.000259)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Log-L	8167.2257	8164.2131	8133.1614	8130.5658	8139.0906	8136.2284	8123.7281	8120.6685	8121.8799	8118.6398	8121.6711	8118.4774	8121.9277	8118.5328
No. of countries/ observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.3043	0.2861	0.0007	0.0007	0.5936	-0.0357	0.4453	0.4514	0.3687	0.3813	0.3900	0.3802	0.5950	0.5491

Notes: VIX: CBOE Volatility index; UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; 6 Month LIBOR: Interbank 6 month Libor Rate; Bond Yields: 10-year Government Bond Yields; HICP: Harmonized Consumer Price Index (Inflation); Zero Lower Bound: A dummy variable that tracks a specific time period, where government bond yields were close to 0; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the -xsmle- Stata command (Belotti et al., 2017). Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.8: Total Bank Credit to MFI's and Unconventional Monetary Policy effects (Long-run Total effects)

Interaction Matrix (W):	Dependent variable MFI Total													
	Trade	Portfolio		Credit	Socioeconomic		FDI	Debt to GDP		Deficit to GDP				
Independent Variables														
VIX	0.00323*** (0.00108)	0.00294*** (0.00103)	0.00302*** (0.00108)	0.00271*** (0.00103)	0.00299*** (0.00111)	0.00267** (0.00105)	0.00322*** (0.00107)	0.00290*** (0.00102)	0.00324*** (0.00105)	0.00291*** (0.00100)	0.00319*** (0.00104)	0.00287*** (0.00099)	0.00320*** (0.00099)	0.00289*** (0.00094)
Industrial Production Index	0.0251** (0.0101)	0.0248** (0.0100)	0.0280*** (0.0103)	0.0278*** (0.0103)	0.0293*** (0.0103)	0.0291*** (0.0103)	0.0286*** (0.00981)	0.0287*** (0.00979)	0.0282*** (0.00957)	0.0282*** (0.00954)	0.0282*** (0.00934)	0.0282*** (0.00930)	0.0284*** (0.00941)	0.0284*** (0.00941)
UMP Announcements (-1)	0.00154** (0.000644)		0.00148** (0.000665)		0.00166** (0.000701)		0.00169** (0.000697)		0.00170** (0.000684)		0.00167** (0.000677)		0.00169*** (0.000653)	
UMP Announcements (+1)		0.000596 (0.000536)		0.000423 (0.000581)		0.000673 (0.000579)		0.000716 (0.000582)		0.000721 (0.000571)		0.000714 (0.000563)		0.000716 (0.000538)
CMP Announcements	-0.000224 (0.000660)	-0.000474 (0.000677)	-0.000143 (0.000704)	-0.000347 (0.000750)	-0.000196 (0.000745)	-0.000457 (0.000780)	-0.000268 (0.000723)	-0.000533 (0.000775)	-0.000285 (0.000706)	-0.000553 (0.000758)	-0.000301 (0.000697)	-0.000565 (0.000743)	-0.000305 (0.000681)	-0.000571 (0.000720)
PSPP	0.000380** (0.000174)	0.000404** (0.000182)	0.000373** (0.000180)	0.000401** (0.000187)	0.000288 (0.000179)	0.000311* (0.000189)	0.000342** (0.000174)	0.000365** (0.000184)	0.000344** (0.000171)	0.000367** (0.000180)	0.000347** (0.000170)	0.000369** (0.000179)	0.000366** (0.000164)	0.000390** (0.000174)
Monetary Policy Index	-0.00159** (0.000646)	-0.00153** (0.000644)	-0.00188*** (0.000612)	-0.00185*** (0.000615)	-0.00172** (0.000688)	-0.00167** (0.000689)	-0.00163** (0.000663)	-0.00159** (0.000671)	-0.00159** (0.000653)	-0.00155** (0.000661)	-0.00159** (0.000647)	-0.00156** (0.000655)	-0.00156** (0.000656)	-0.00152** (0.000667)
6 Month LIBOR	-0.000597 (0.000907)	-0.000341 (0.000946)	-0.000769 (0.000915)	-0.000577 (0.000973)	-0.000777 (0.00100)	-0.000509 (0.00105)	-0.000568 (0.000936)	-0.000284 (0.00100)	-0.000563 (0.000916)	-0.000278 (0.000981)	-0.000541 (0.000907)	-0.000258 (0.000969)	-0.000518 (0.000897)	-0.000230 (0.000954)
Bond Yields	-0.0386*** (0.0144)	-0.0385*** (0.0143)	-0.0390** (0.0152)	-0.0391*** (0.0150)	-0.0400*** (0.0145)	-0.0401*** (0.0146)	-0.0394*** (0.0151)	-0.0398*** (0.0151)	-0.0389*** (0.0148)	-0.0392*** (0.0148)	-0.0383*** (0.0144)	-0.0386*** (0.0145)	-0.0361*** (0.0140)	-0.0364*** (0.0141)
HICP	0.0276 (0.0174)	0.0270 (0.0174)	0.0296* (0.0158)	0.0289* (0.0160)	0.0278* (0.0153)	0.0273* (0.0154)	0.0303** (0.0154)	0.0300* (0.0155)	0.0302** (0.0151)	0.0298* (0.0152)	0.0303** (0.0150)	0.0300** (0.0151)	0.0294** (0.0149)	0.0290* (0.0150)
Zero Lower Bound	-0.00352*** (0.000772)	-0.00349*** (0.000773)	-0.00367*** (0.000800)	-0.00364*** (0.000799)	-0.00325*** (0.000794)	-0.00322*** (0.000802)	-0.00315*** (0.000775)	-0.00312*** (0.000785)	-0.00314*** (0.000757)	-0.00310*** (0.000768)	-0.00311*** (0.000757)	-0.00307*** (0.000767)	-0.00312*** (0.000700)	-0.00309*** (0.000709)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Log-L	8167.2257	8164.2131	8133.1614	8130.5658	8139.0906	8136.2284	8123.7281	8120.6685	8121.8799	8118.6398	8121.6711	8118.4774	8121.9277	8118.5328
No. of countries/ observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.3043	0.2861	0.0007	0.0007	0.5936	-0.0357	0.4453	0.4514	0.3687	0.3813	0.3900	0.3802	0.5950	0.5491

Notes: VIX: CBOE Volatility index; UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; 6 Month LIBOR: Interbank 6 month Libor Rate; Bond Yields: 10-year Government Bond Yields; HICP: Harmonized Consumer Price Index (Inflation); Zero Lower Bound: A dummy variable that tracks a specific time period, where government bond yields were close to 0; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the -xsmle- Stata command (Belotti et al., 2017). Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

2.11 Conclusions

This paper estimates the effects of the unconventional monetary policy measures of the ECB on bank credit by taking into account the way that Eurozone countries interact with each other. This is achieved by modeling the total amount of credit, loans to Eurozone governments, credit to Eurozone households, and consumer credit and loans to organizations (financial and all others). To this end, we apply spatial econometric techniques with an event study approach, and create two dummy variables (unconventional and conventional monetary policy measures) and two variables that account for purchases and credit sentiment, which we then use as variables of interest in our spatial autoregressive panel (SAR) model estimations.

The data consists of 18 Eurozone countries and spans from May 2007 to December 2018. Unconventional monetary policies date back to 2001 in Japan, and became a prominent tool used for combating the financial crisis of 2007–2009 by the United Kingdom and the United States. As investigated in this paper, the ECB responded late to the financial crisis, and failed to meet the urgency of the situation adequately, and as such, credit lines experienced deteriorating conditions. This late provision of liquidity to the Eurozone economies had an adverse effect on their ability to control the severity of the financial crisis, and the programs that were implemented early were not enough to provide adequate liquidity to the system.

Based on the literature review, large-scale asset purchase programs affect variables of an economic and financial nature through a plethora of different transmission channels. This paper focused on a specific channel (bank credit), and utilized seven different mechanisms of interconnectedness. From the analysis, we can conclude that unconventional monetary policies positively impact credit lines in an immediate way as well as through neighboring effects, even if the measures are not implemented in a timely manner.

Recent structural developments combined with an unprecedented shift in monetary and government policies may have irreversibly changed the relationship between the dynamics of macroeconomic and credit variables. Thus, future research should attempt to investigate the importance of the credit channel with regard to the transmission of monetary policy changes over time. Even though this paper has produced noteworthy results, there are some fundamental limitations. The most important one can be summarized by the fact that QE, as a policy, is relatively new, and thus its full consequences are not yet known, due to a lack of available data. As a way to combat this, we extended the time dimension and considered an event study methodology. Nonetheless, future research should also consider newer asset purchase programs (such as the pandemic emergency purchase program), as their effects may differ as the policies progress and evolve.

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Appendix

Table 2.9: List of countries

Country	ISO Code
Austria	AUT
Belgium	BEL
Cyprus	CYP
Finland	FIN
France	FRA
Germany	DEU
Greece	GRC
Ireland	IRL
Italy	ITA
Latvia	LVA
Lithuania	LTU
Luxembourg	LUX
Malta	MLT
Slovakia	SVK
Slovenia	SVN
Netherlands	NLD
Portugal	PRT
Spain	ESP

Notes: The 18 economies included in the paper with their respective ISO code.

Table 2.10: Announcements that are related to unconventional policy measures

Date	Announcement
August 22, 2007	Supplement to the LTRO programme
August 23, 2007	Allotment LTRO
March 28, 2008	Announcement of the six-month LTRO
May 7, 2009	Announcement of the One-year LTRO and CBPP
June 4, 2009	Details to the CBPP programme
December 3, 2009	Amendments to the LTRO programme
March 4, 2010	Amendments to the LTRO programme
May 10, 2010	Securities Markets Programme (SMP)
March 3, 2011	Refinancing Operations
August 4, 2011	SMP announcement
October 6, 2011	Second round of CBPP announcement
December 8, 2011	New LTRO specifications

December 21, 2011	Yearly Results of LTRO for 2011
February 9, 2012	Credit Claims
February 28, 2012	LTRO Results
July 26, 2012	M. Draghi speech
August 2, 2012	Outright Monetary Transactions (OMT)
September 6, 2012	Details of the OMT programme
March 22, 2013	Collateral Rules
June 5, 2014	TLTRO and ABSP related announcements
July 3, 2014	Details to the TLTRO programme
September 4, 2014	Third round of the CBPP and ABSPP programmes
September 18, 2014	M. Draghi speech
January 22, 2015	EAPP and the future of LTRO
March 9, 2015	PSPP announcement, together with QE
September 23, 2015	ABSPP purchase adjustments
November 9, 2015	PSPP limit increase
December 3, 2015	APP extension until March 2017
March 10, 2016	PSPP limit increase
March 10, 2016	New LTRO
March 10, 2016	Corporate Sector Purchase Programme (CSPP) addition to the APP
April 21, 2016	PSPP limit increase
April 21, 2016	CSPP Details
May 3, 2016	TLTRO related announcements
June 22, 2016	CSPP Details
November 3, 2016	ECB guidelines and risk control adjustments
December 15, 2016	PSPP cash collateral
January 19, 2017	Policy decisions
June 8, 2017	Policy decisions
October 26, 2017	Asset purchase programme information
December 14, 2017	Policy decisions
July 11, 2018	Calendar publication
December 13, 2018	Reinvestment period technical details

Notes: This is an extension of the tables found in Rogers et al. (2014), Haistma et al. (2016), with the addition of announcements regarding unconventional monetary decisions until the end of 2018. The table includes the date of the announcement and a short description.

Table 2.11: Announcements that are related to conventional monetary policy changes

Date
July 3, 2008
November 6, 2008
December 4, 2008
January 15, 2009
March 5, 2009
April 2, 2009
May 7, 2009
April 7, 2011
July 7, 2011
November 3, 2011
December 8, 2011
July 5, 2012
May 2, 2013
November 7, 2013
May 8, 2014
September 4, 2014
December 3, 2015
March 10, 2016

Source: Announcements are reported in the ECB website.

Table 2.12: Monetary Policy Index

Keywords
Quantitative Easing
ECB
European Central Bank

Notes: Keyword selection is based on the “Related Queries” provided by Google Trends. Other examples that follow in this line include Wohlfarth (2017).

Table 2.13: Credit rating linear transformation

Debt Characterization	Rating	Value of Linear Transformation
Credit Rating Agency	Moody's	
Highest possible investment grade	Aaa	17
Strong capacity for repayment of debt	Aa1	16
	Aa2	15
	Aa3	14
Adequate capacity for repayment of debt	A1	13
	A2	12
	A3	11
Likely to fulfil all obligations, with a degree of uncertainty	Baa1	10
	Baa2	9
	Baa3	8
Elevated credit risk	B1	7
	B2	6
	B3	5
Extremely elevated credit risk	Caa1	4
	Caa2	3
	Caa3	2
Near default/possible recovery	Ca	1
Default	C	

Notes: The above linear transformation has been used previously in the literature. For an extensive explanation behind its rational you can see Afonso et al. (2011).

Table 2.14: Distance matrix data sources

Matrix	Source	Time Dimension
Trade intensity	WITS Database	2008-2018
Portfolio holdings	IMF Coordinated Portfolio Investment Survey	2008-2018
Foreign direct investment	OECD	2008-2012
Social proximity	ICRG Database	2008-2018
Debt similarity	Eurostat	2008-2018
Deficit similarity	Eurostat	2008-2018
Investment credit rating	Moody's	2008-2018

Notes: All matrices are calculated as an average for their respective period. The available data for the Foreign direct investment matrix do not cover the whole sample, so they were calculated based on the most recent date of full coverage.

Table 2.15: Dependent and independent variable data sources

Variable	Frequency	Source	Variable type
Dependent Variables			
MFI Total Value	Monthly	Datastream	Log Difference
MFI towards governments	Monthly	Datastream	Log Difference
MFI to pension funds	Monthly	Datastream	Log Difference
MFI not for house purchase	Monthly	Datastream	Log Difference
MFI for house purchase	Monthly	Datastream	Log Difference
MFI for consumer credit	Monthly	Datastream	Log Difference
MFI to other organizations	Monthly	Datastream	Log Difference
MFI to financial intermediaries	Monthly	Datastream	Log Difference
Independent Variables			
VIX	Monthly	CBOE	Log Difference
Bond yields	Monthly	Eurostat	Percentage
Industrial production	Monthly	Eurostat	Log
Inflation	Monthly	Eurostat	Percent
Unconventional Monetary Policy announcements	Monthly	ECB	Dummy
Monetary Policy Index	Monthly	Google Trends	Percentage
Conventional Monetary Policy announcements	Monthly	ECB	Dummy
Zero Lower Bound Period	Monthly	Author	Dummy
Public Sector Purchase Programme	Monthly	ECB	Log
Libor Rate	Monthly	iborate.com	Percentage

Notes: Data sources for all variables included in the estimated models.

Figure 2.2. Heatmap of the Standardized Trade Distance Matrix

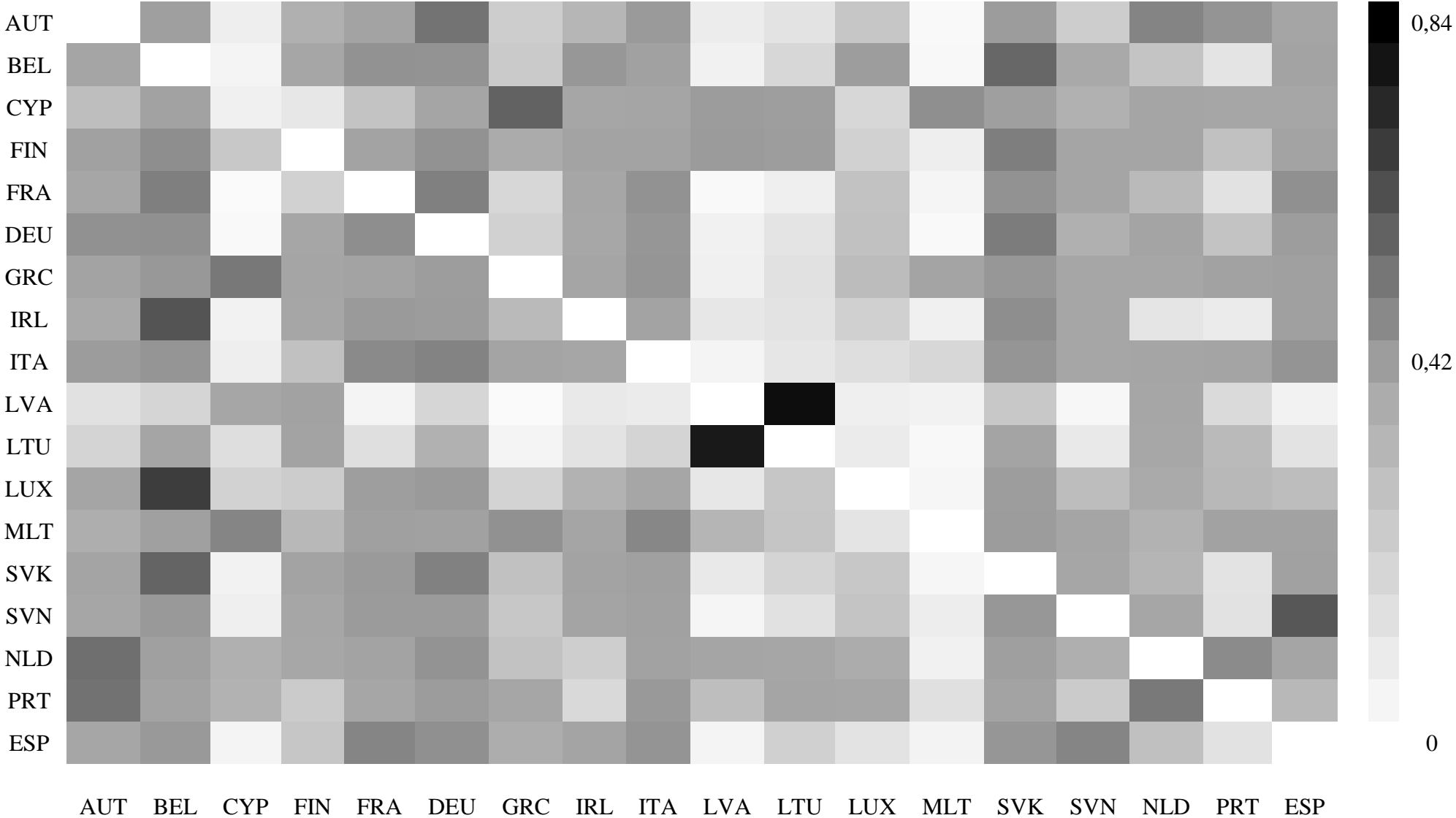
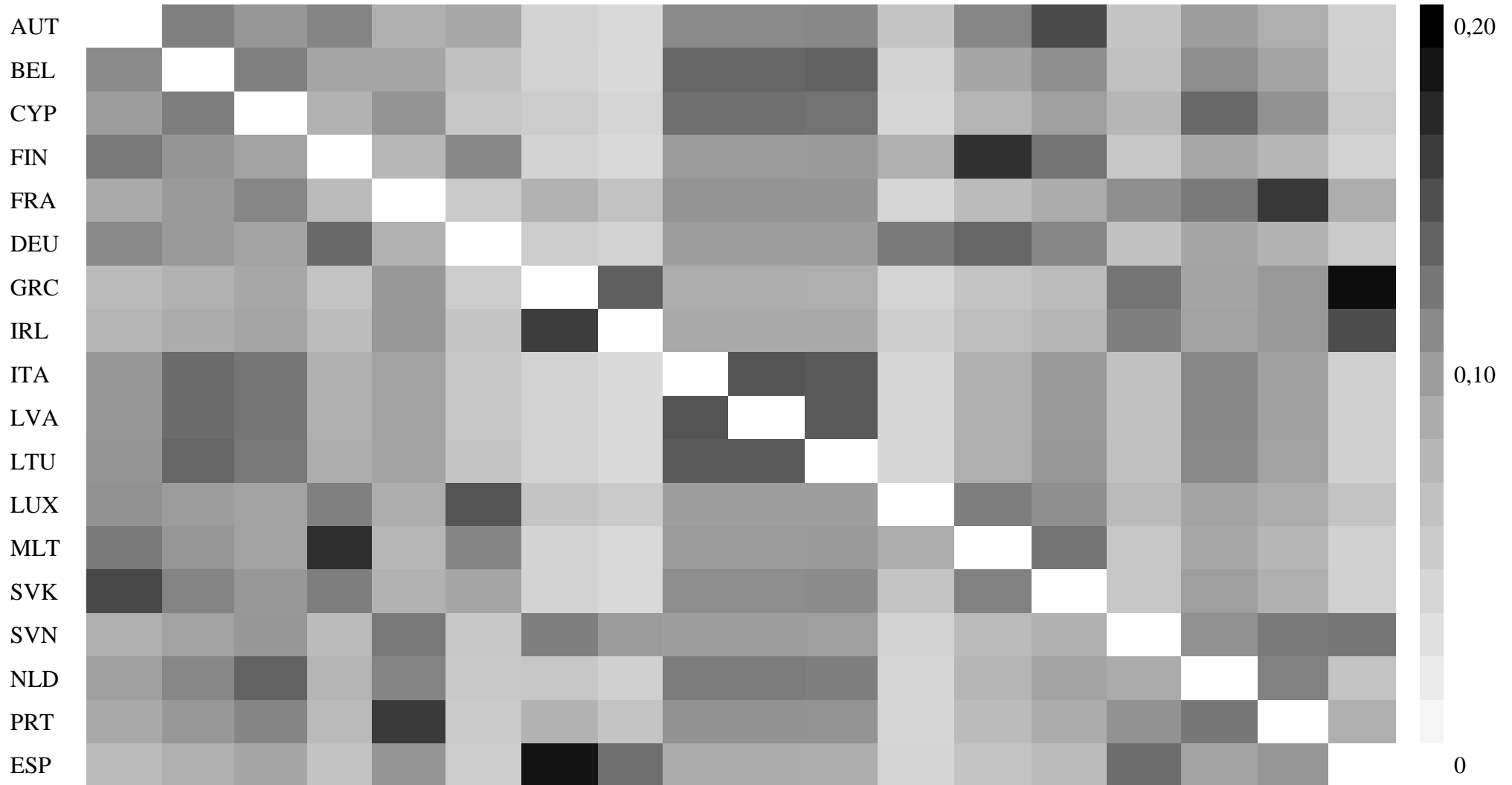
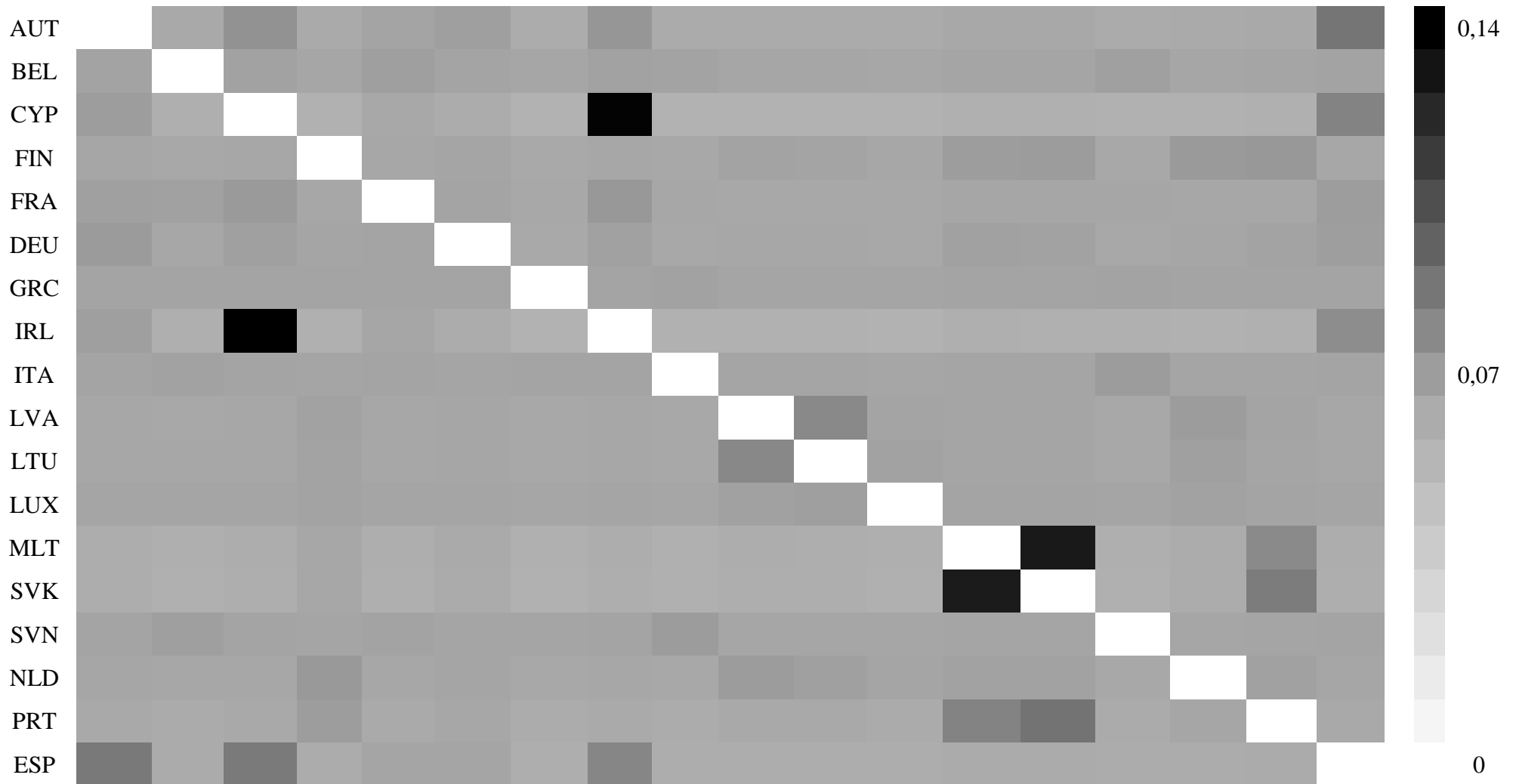


Figure 2.4. Heatmap of the Standardized Distance Matrix Deficit to GDP



AUT BEL CYP FIN FRA DEU GRC IRL ITA LVA LTU LUX MLT SVK SVN NLD PRT ESP

Figure 2.5. Heatmap of the Standardized Distance Matrix Debt to GDP



AUT BEL CYP FIN FRA DEU GRC IRL ITA LVA LTU LUX MLT SVK SVN NLD PRT ESP

Figure 2.6. Heatmap of the Standardized Credit Rating Similarity Matrix

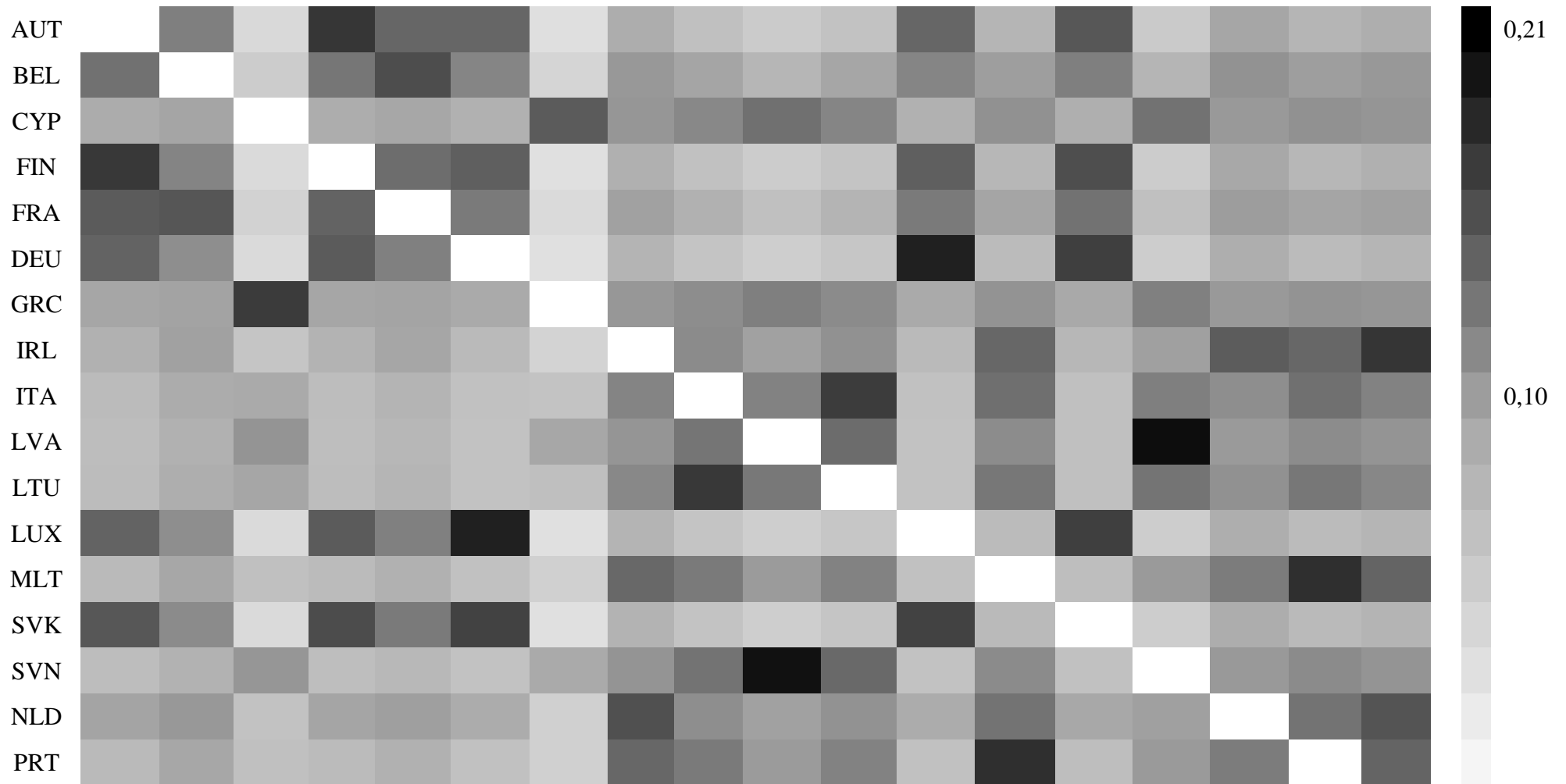




Figure 2.7. Heatmap of the Standardized Portfolio Distance Matrix





Figure 2.8. Heatmap of the Standardized Social Proximity Matrix

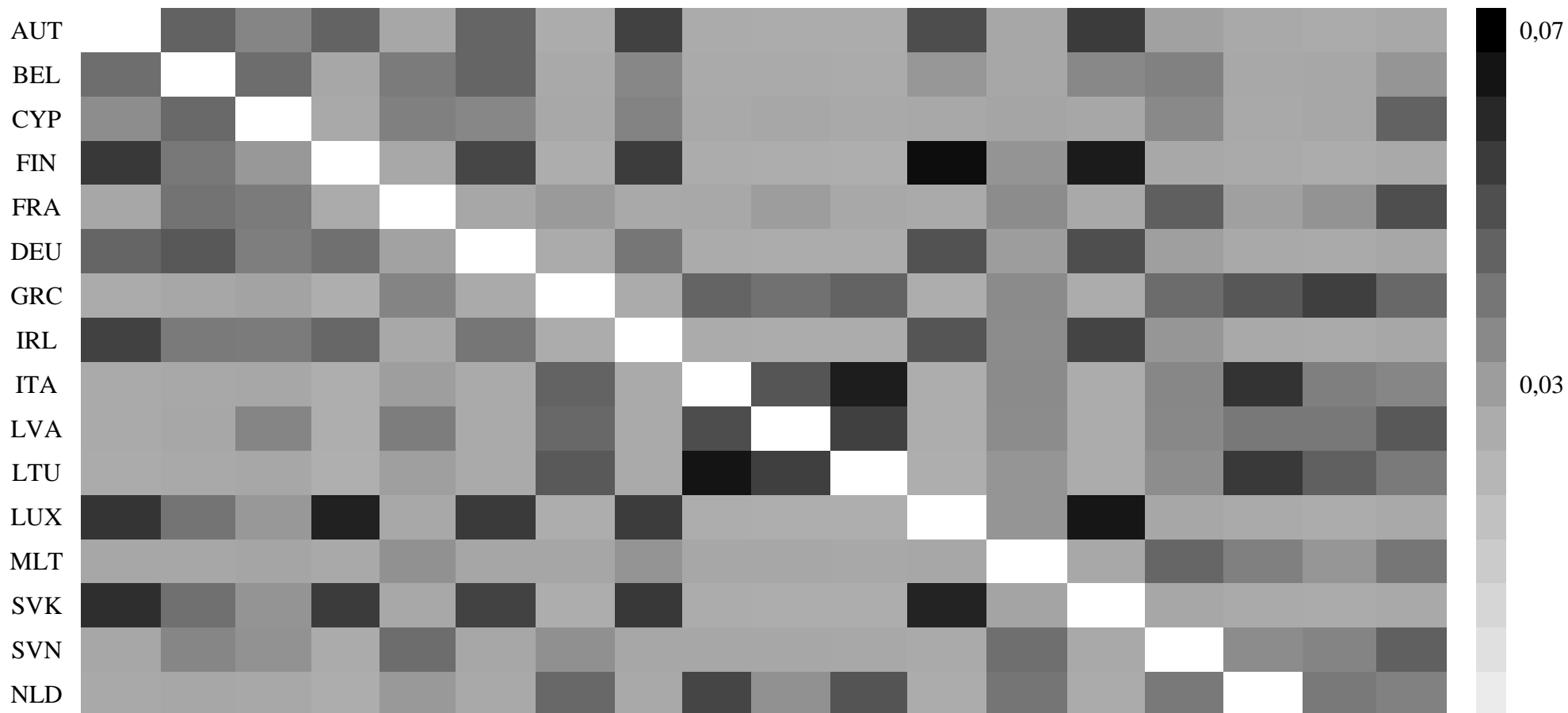




Figure 2.9. Heatmap of the Standardized FDI Distance Matrix



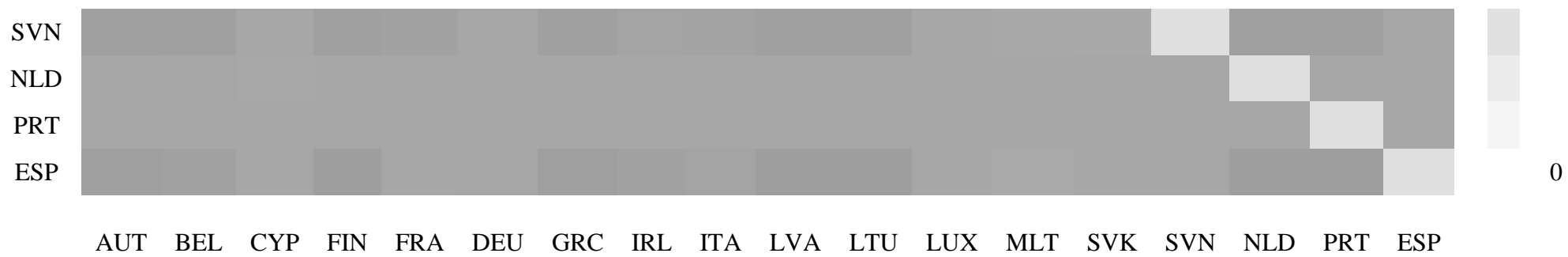
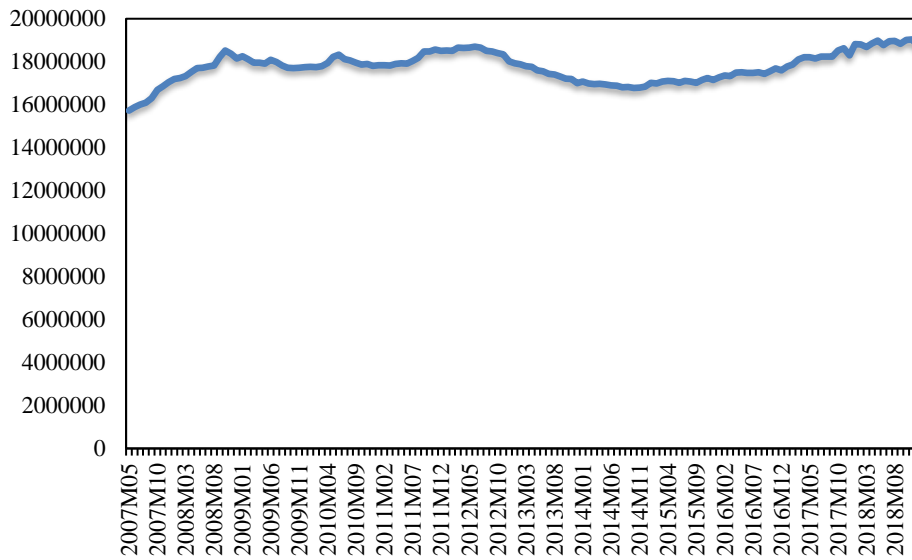
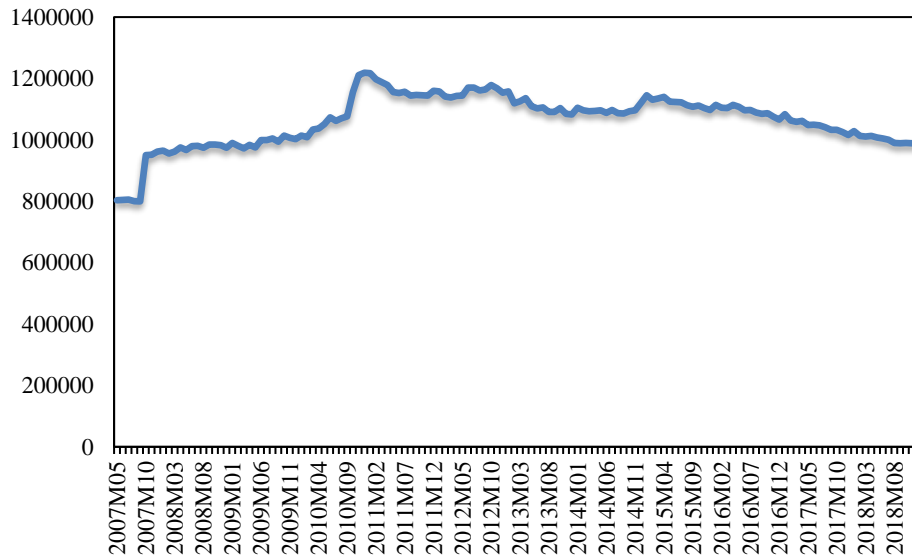


Figure 2.10. MFI Total Credit



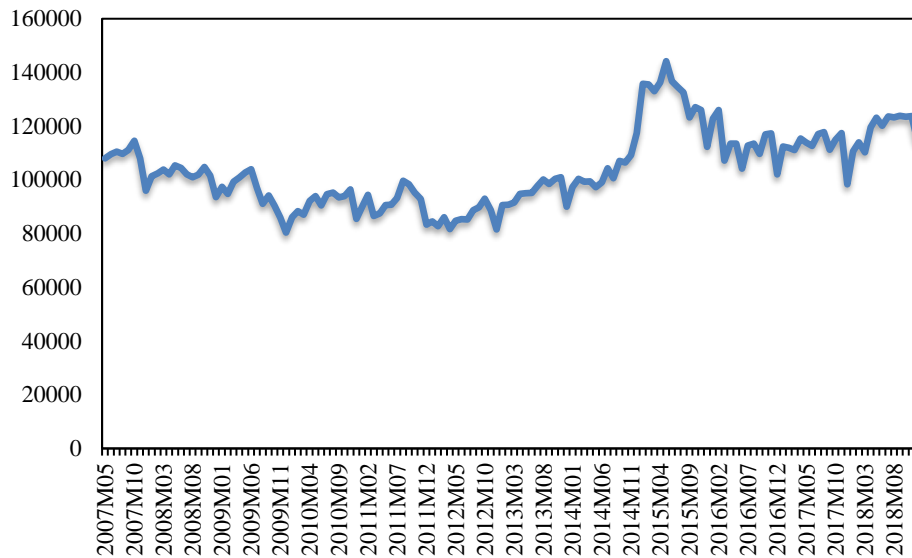
Notes: This graph illustrates the value of the Total MFI Credit for the period May 2007 to December 2018. All loans are in millions of euros. The vertical axis depicts the value of the loans, while the horizontal axis depicts the date.

Figure 2.11. MFI Credit towards Governments



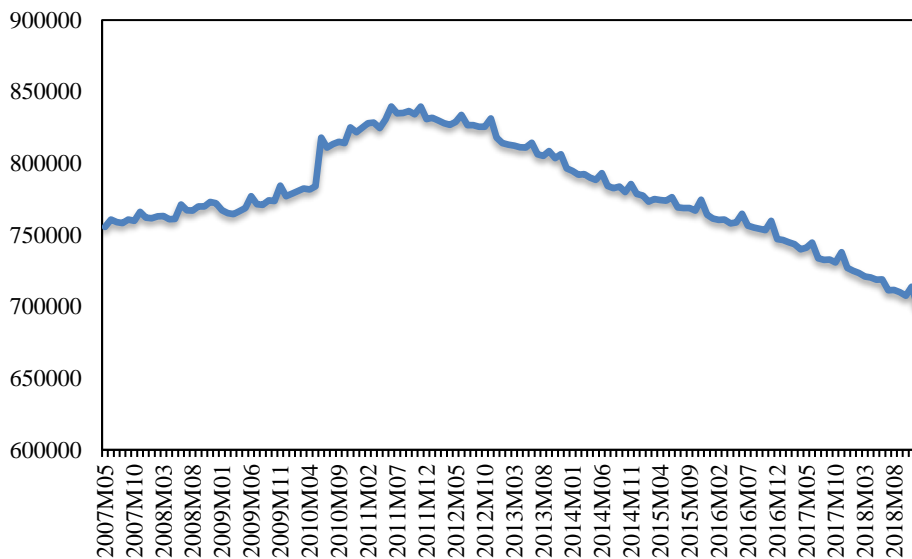
Notes: This graph illustrates the value of the MFI Credit to Governments for the period May 2007 to December 2018. All loans are in millions of euros. The vertical axis depicts the value of the loans, while the horizontal axis depicts the date.

Figure 2.12. MFI Credit to Pension Funds



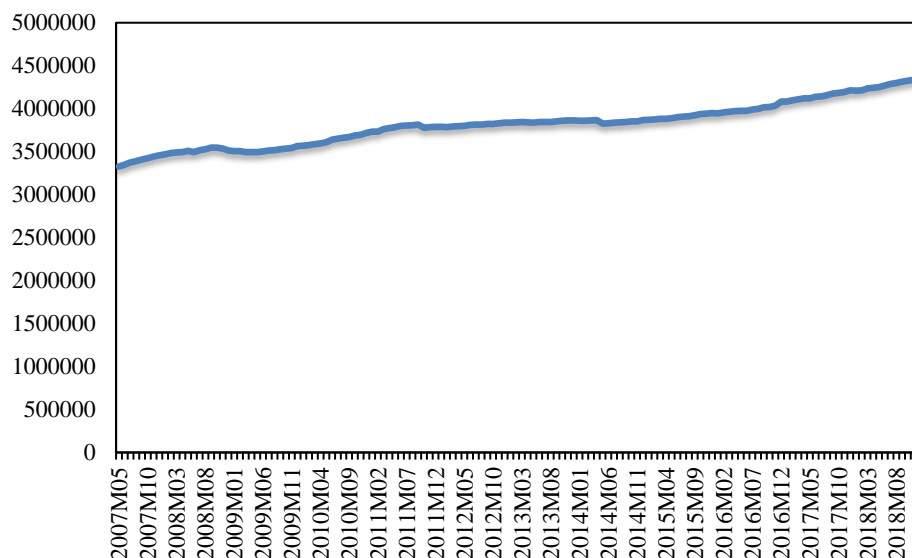
Notes: This graph illustrates the value of the MFI Credit to Pension Funds for the period May 2007 to December 2018. All loans are in millions of euros. The vertical axis depicts the value of the loans, while the horizontal axis depicts the date.

Figure 2.13. MFI Credit to households (excluding house purchases)



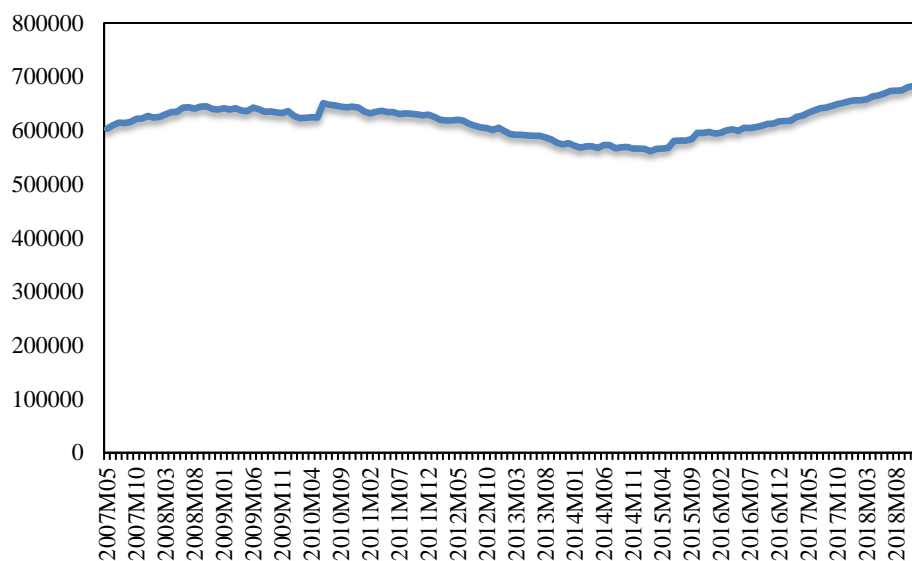
Notes: This graph illustrates the value of the MFI Credit to Households (excluding credit that was used for house purchases) for the period May 2007 to December 2018. All loans are in millions of euros. The vertical axis depicts the value of the loans, while the horizontal axis depicts the date.

Figure 2.14. MFI Credit to Households (including house purchases)



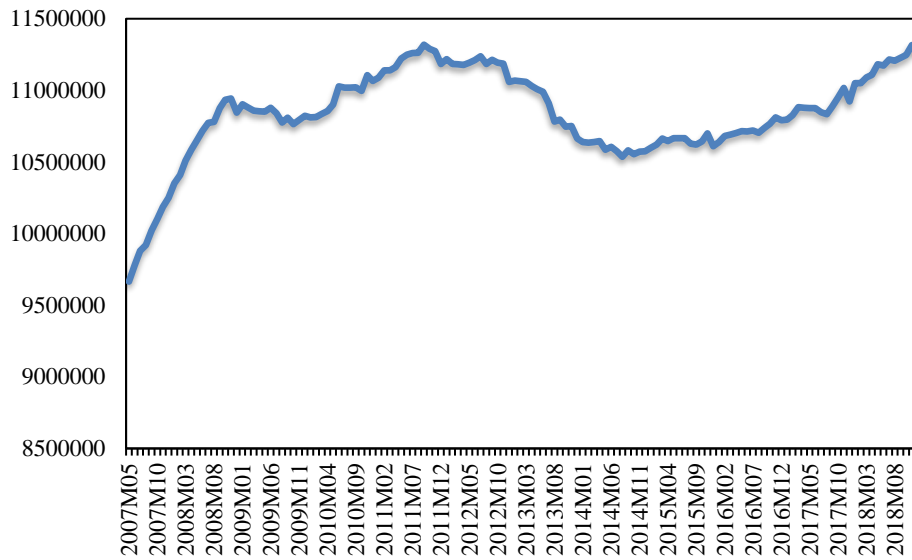
Notes: This graph illustrates the value of the MFI Credit to Households (including credit that was used for house purchases) for the period May 2007 to December 2018. All loans are in millions of euros. The vertical axis depicts the value of the loans, while the horizontal axis depicts the date.

Figure 2.15. MFI Credit towards Consumer Credit



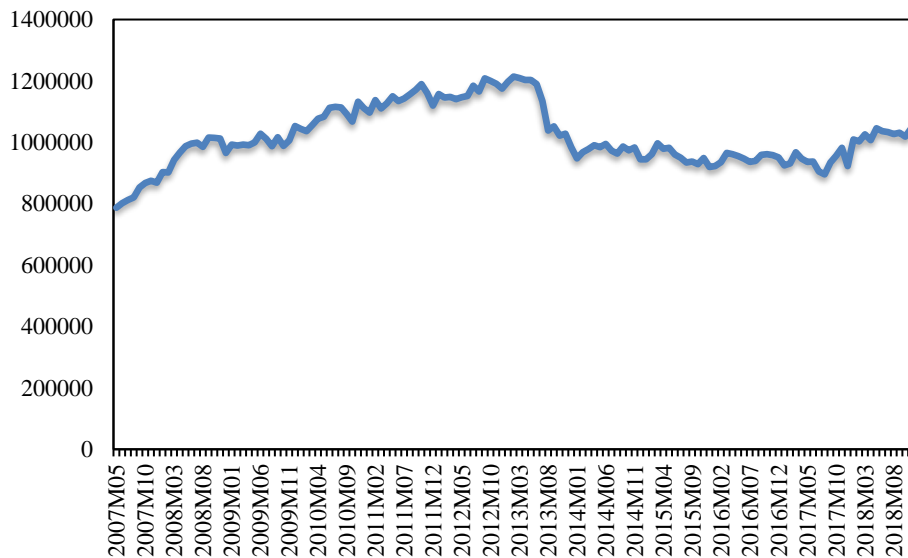
Notes: This graph illustrates the value of the MFI Consumer related credit for the period May 2007 to December 2018. All loans are in millions of euros. The vertical axis depicts the value of the loans, while the horizontal axis depicts the date.

Figure 2.16. MFI Credit to Other Organizations



Notes: This graph illustrates the value of MFI Credit to Other Organizations for the period May 2007 to December 2018. All loans are in millions of euros. The vertical axis depicts the value of the loans, while the horizontal axis depicts the date.

Figure 2.17. MFI Credit to Financial Intermediaries



Notes: This graph illustrates the value of MFI Credit to Financial Intermediaries for the period May 2007 to December 2018. All loans are in millions of euros. The vertical axis depicts the value of the loans, while the horizontal axis depicts the date.

Table 2.16: Credit to Governments and Unconventional Monetary Policy effects

Interaction Matrix (W):	Dependent variable Government Credit													
	Trade		Portfolio		Credit		Socioeconomic		FDI		Debt to GDP		Deficit to GDP	
Independent Variables														
UMP Announcements (-1)	0.00252*		0.00247*		0.00245*		0.000157		0.000190		0.000166		0.000266	
	(0.00129)		(0.00128)		(0.00128)		(0.00478)		(0.00480)		(0.00480)		(0.00480)	
UMP Announcements (+1)	-0.00226		-0.00233		-0.00236		-0.00228		-0.00227		-0.00221		-0.00232	
	(0.00162)		(0.00166)		(0.00171)		(0.00167)		(0.00168)		(0.00168)		(0.00169)	
CMP Announcements	0.00184	0.00200	0.00179	0.00196	0.00180	0.00198	-0.0195***	0.00192	-0.0194***	0.00191	-0.0195***	0.00191	-0.0188***	0.00191
	(0.00219)	(0.00235)	(0.00213)	(0.00229)	(0.00214)	(0.00230)	(0.00661)	(0.00230)	(0.00661)	(0.00230)	(0.00662)	(0.00231)	(0.00671)	(0.00230)
PSP	-0.00114*	-0.000985	-0.00111*	-0.000955	-0.00111*	-0.000954	-0.00285	-0.000933	-0.00283	-0.000932	-0.00286	-0.000931	-0.00277	-0.000896
	(0.000630)	(0.000672)	(0.000639)	(0.000681)	(0.000634)	(0.000679)	(0.00310)	(0.000668)	(0.00309)	(0.000669)	(0.00310)	(0.000669)	(0.00308)	(0.000676)
Monetary Policy Index	-0.00425*	-0.00414*	-0.00416*	-0.00405*	-0.00410*	-0.00400*	0.000887	-0.00405*	0.000880	-0.00405*	0.000898	-0.00406*	0.000952	-0.00410**
	(0.00224)	(0.00222)	(0.00213)	(0.00212)	(0.00209)	(0.00208)	(0.00576)	(0.00207)	(0.00576)	(0.00207)	(0.00577)	(0.00207)	(0.00575)	(0.00208)
Short-run direct effects														
UMP Announcements (-1)	0.00256**		0.00252**		0.00248*		0.000283		0.000317		0.000290		0.000392	
	(0.00128)		(0.00127)		(0.00127)		(0.00467)		(0.00468)		(0.00468)		(0.00471)	
UMP Announcements (+1)	-0.00219		-0.00226		-0.00227		-0.00221		-0.00220		-0.00214		-0.00223	
	(0.00161)		(0.00167)		(0.00169)		(0.00167)		(0.00167)		(0.00167)		(0.00167)	
CMP Announcements	0.00183	0.00190	0.00181	0.00190	0.00179	0.00189	-0.0194***	0.00186	-0.0194***	0.00185	-0.0195***	0.00186	-0.0188***	0.00182
	(0.00228)	(0.00244)	(0.00220)	(0.00240)	(0.00223)	(0.00239)	(0.00688)	(0.00242)	(0.00688)	(0.00242)	(0.00688)	(0.00242)	(0.00699)	(0.00238)
PSP	-0.00114*	-0.00100	-0.00110	-0.000957	-0.00111*	-0.000970	-0.00275	-0.000937	-0.00274	-0.000936	-0.00276	-0.000934	-0.00267	-0.000913
	(0.000670)	(0.000648)	(0.000673)	(0.000669)	(0.000672)	(0.000654)	(0.00295)	(0.000647)	(0.00294)	(0.000648)	(0.00295)	(0.000647)	(0.00294)	(0.000644)
Monetary Policy Index	-0.00426*	-0.00410*	-0.00420*	-0.00403*	-0.00411*	-0.00394*	0.000663	-0.00402*	0.000654	-0.00402*	0.000678	-0.00404*	0.000730	-0.00405*
	(0.00232)	(0.00234)	(0.00218)	(0.00223)	(0.00213)	(0.00216)	(0.00600)	(0.00218)	(0.00600)	(0.00218)	(0.00601)	(0.00219)	(0.00600)	(0.00217)

Short-run indirect effects														
UMP Announcements (-1)	3.00e-05		-4.97e-06		9.07e-05		2.78e-05		2.68e-05		3.07e-05		1.11e-05	
	(4.08e-05)		(8.39e-05)		(7.02e-05)		(0.000210)		(0.000199)		(0.000205)		(0.000164)	
UMP Announcements (+1)		-4.16e-05		-3.18e-05		-9.38e-05		-0.000172		-0.000178		-0.000211		-0.000158
		(5.06e-05)		(8.47e-05)		(9.30e-05)		(0.000154)		(0.000157)		(0.000180)		(0.000139)
CMP Announcements	3.01e-05	2.96e-05	2.23e-05	2.58e-05	6.55e-05	6.73e-05	0.000801	0.000139	0.000730	0.000144	0.000793	0.000185	0.000613	0.000137
	(5.47e-05)	(5.53e-05)	(9.01e-05)	(9.34e-05)	(0.000103)	(0.000108)	(0.000705)	(0.000201)	(0.000685)	(0.000208)	(0.000680)	(0.000252)	(0.000519)	(0.000192)
PSPP	-1.20e-05	-1.02e-05	-9.36e-06	-9.11e-06	-4.54e-05	-3.93e-05	0.000148	-7.36e-05	0.000141	-7.70e-05	0.000142	-9.20e-05	0.000102	-5.88e-05
	(1.89e-05)	(1.61e-05)	(3.92e-05)	(3.51e-05)	(4.25e-05)	(3.98e-05)	(0.000180)	(6.54e-05)	(0.000173)	(6.76e-05)	(0.000173)	(7.37e-05)	(0.000127)	(4.78e-05)
Monetary Policy Index	-6.15e-05	-5.50e-05	-3.18e-05	-3.06e-05	-0.000159	-0.000146	-3.53e-05	-0.000303	-2.94e-05	-0.000316	-4.41e-05	-0.000395	-3.88e-05	-0.000284
	(7.96e-05)	(7.12e-05)	(0.000148)	(0.000136)	(0.000129)	(0.000121)	(0.000282)	(0.000221)	(0.000267)	(0.000227)	(0.000274)	(0.000261)	(0.000217)	(0.000197)
Short-run Total effects														
UMP Announcements (-1)	0.00259**		0.00251**		0.00257**		0.000311		0.000343		0.000321		0.000403	
	(0.00128)		(0.00124)		(0.00131)		(0.00451)		(0.00454)		(0.00452)		(0.00458)	
UMP Announcements (+1)		-0.00223		-0.00229		-0.00236		-0.00238		-0.00238		-0.00235		-0.00239
		(0.00165)		(0.00170)		(0.00176)		(0.00180)		(0.00180)		(0.00184)		(0.00180)
CMP Announcements	0.00186	0.00193	0.00183	0.00193	0.00185	0.00195	-0.0186***	0.00200	-0.0186***	0.00199	-0.0187***	0.00204	-0.0182***	0.00196
	(0.00231)	(0.00248)	(0.00222)	(0.00243)	(0.00232)	(0.00248)	(0.00642)	(0.00260)	(0.00646)	(0.00260)	(0.00643)	(0.00266)	(0.00662)	(0.00256)
PSPP	-0.00115*	-0.00101	-0.00111	-0.000966	-0.00116*	-0.00101	-0.00261	-0.00101	-0.00260	-0.00101	-0.00262	-0.00103	-0.00257	-0.000972
	(0.000674)	(0.000652)	(0.000683)	(0.000678)	(0.000703)	(0.000683)	(0.00281)	(0.000702)	(0.00281)	(0.000705)	(0.00281)	(0.000713)	(0.00284)	(0.000685)
Monetary Policy Index	-0.00432*	-0.00415*	-0.00423*	-0.00406*	-0.00427*	-0.00409*	0.000627	-0.00432*	0.000625	-0.00433*	0.000633	-0.00443*	0.000691	-0.00433*
	(0.00236)	(0.00237)	(0.00221)	(0.00225)	(0.00221)	(0.00224)	(0.00577)	(0.00236)	(0.00579)	(0.00237)	(0.00578)	(0.00242)	(0.00582)	(0.00233)
Long-run direct effects														
UMP Announcements (-1)	0.00243**		0.00238**		0.00235*		0.000230		0.000258		0.000237		0.000320	

	(0.00121)		(0.00121)		(0.00121)		(0.00381)		(0.00382)		(0.00382)		(0.00384)	
UMP Announcements (+1)	-0.00207		-0.00214		-0.00215		-0.00209		-0.00208		-0.00202		-0.00211	
	(0.00152)		(0.00158)		(0.00160)		(0.00158)		(0.00158)		(0.00158)		(0.00158)	
CMP Announcements	0.00174	0.00180	0.00171	0.00180	0.00169	0.00179	-0.0159***	0.00176	-0.0158***	0.00175	-0.0159***	0.00176	-0.0153***	0.00172
	(0.00216)	(0.00231)	(0.00208)	(0.00227)	(0.00211)	(0.00226)	(0.00561)	(0.00229)	(0.00561)	(0.00229)	(0.00562)	(0.00229)	(0.00570)	(0.00225)
PSPP	-0.00108*	-0.000950	-0.00104	-0.000905	-0.00105*	-0.000918	-0.00225	-0.000887	-0.00223	-0.000885	-0.00225	-0.000884	-0.00218	-0.000863
	(0.000635)	(0.000614)	(0.000637)	(0.000633)	(0.000636)	(0.000618)	(0.00241)	(0.000612)	(0.00240)	(0.000613)	(0.00240)	(0.000612)	(0.00240)	(0.000610)
Monetary Policy Index	-0.00404*	-0.00388*	-0.00397*	-0.00381*	-0.00389*	-0.00373*	0.000541	-0.00380*	0.000534	-0.00380*	0.000553	-0.00382*	0.000595	-0.00383*
	(0.00220)	(0.00222)	(0.00206)	(0.00211)	(0.00201)	(0.00205)	(0.00489)	(0.00206)	(0.00489)	(0.00207)	(0.00490)	(0.00207)	(0.00489)	(0.00205)
Long-run indirect effects														
UMP Announcements (-1)	-0.000150*		-0.000117		-1.12e-05		-1.21e-05		-1.57e-05		-1.18e-05		-2.07e-05	
	(8.94e-05)		(0.000108)		(5.40e-05)		(0.000539)		(0.000530)		(0.000547)		(0.000407)	
UMP Announcements (+1)		0.000109		5.98e-05		-3.70e-06		-0.000111		-0.000121		-8.92e-05		-0.000187
		(7.86e-05)		(7.79e-05)		(5.01e-05)		(0.000110)		(0.000115)		(9.18e-05)		(0.000156)
CMP Announcements	-0.000100	-0.000100	-6.32e-05	-5.10e-05	-7.85e-06	-5.84e-06	0.00229**	8.84e-05	0.00223**	9.72e-05	0.00232**	7.90e-05	0.00165**	0.000160
	(0.000130)	(0.000132)	(0.000110)	(0.000102)	(5.27e-05)	(5.26e-05)	(0.000957)	(0.000137)	(0.000935)	(0.000148)	(0.000960)	(0.000120)	(0.000728)	(0.000218)
PSPP	6.77e-05	5.71e-05	4.17e-05	2.89e-05	9.84e-07	-8.92e-07	0.000342	-4.75e-05	0.000335	-5.26e-05	0.000344	-3.88e-05	0.000243	-7.10e-05
	(4.49e-05)	(4.07e-05)	(3.88e-05)	(3.44e-05)	(2.49e-05)	(2.29e-05)	(0.000363)	(4.76e-05)	(0.000356)	(5.04e-05)	(0.000365)	(3.91e-05)	(0.000265)	(5.43e-05)
Monetary Policy Index	0.000240*	0.000223*	0.000163	0.000128	1.12e-05	7.63e-06	-8.23e-05	-0.000193	-7.79e-05	-0.000214	-8.96e-05	-0.000165	-7.27e-05	-0.000336
	(0.000140)	(0.000135)	(0.000144)	(0.000129)	(8.60e-05)	(8.01e-05)	(0.000702)	(0.000163)	(0.000688)	(0.000171)	(0.000711)	(0.000144)	(0.000524)	(0.000216)
Long-run total effects														
UMP Announcements (-1)	0.00228**		0.00226**		0.00234**		0.000218		0.000242		0.000225		0.000299	
	(0.00113)		(0.00112)		(0.00119)		(0.00327)		(0.00330)		(0.00328)		(0.00344)	
UMP Announcements (+1)	-0.00196		-0.00208		-0.00215		-0.00220		-0.00220		-0.00211		-0.00230	

		(0.00145)		(0.00154)		(0.00160)		(0.00166)		(0.00167)		(0.00165)		(0.00173)
CMP Announcements	0.00164	0.00170	0.00165	0.00175	0.00168	0.00178	-0.0136***	0.00185	-0.0136***	0.00185	-0.0136***	0.00184	-0.0137***	0.00188
	(0.00203)	(0.00218)	(0.00200)	(0.00221)	(0.00210)	(0.00226)	(0.00471)	(0.00240)	(0.00473)	(0.00241)	(0.00470)	(0.00240)	(0.00500)	(0.00246)
PSPP	-0.00101*	-0.000893	-0.000996	-0.000876	-0.00105*	-0.000919	-0.00190	-0.000934	-0.00190	-0.000938	-0.00191	-0.000923	-0.00193	-0.000934
	(0.000593)	(0.000575)	(0.000614)	(0.000615)	(0.000638)	(0.000622)	(0.00205)	(0.000649)	(0.00205)	(0.000653)	(0.00204)	(0.000641)	(0.00214)	(0.000658)
Monetary Policy Index	-0.00380*	-0.00366*	-0.00381*	-0.00368*	-0.00388*	-0.00372*	0.000458	-0.00399*	0.000456	-0.00402*	0.000463	-0.00398*	0.000522	-0.00416*
	(0.00207)	(0.00209)	(0.00198)	(0.00204)	(0.00200)	(0.00204)	(0.00420)	(0.00218)	(0.00421)	(0.00219)	(0.00419)	(0.00218)	(0.00438)	(0.00224)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LogL	4383.5403	4383.3792	4382.0949	4381.9949	4382.3157	4382.2563	379.754	4382.6015	379.7637	4382.6729	379.775	4383.3646	379.1266	4382.606
No. of countries/observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.0768	0.0460	0.0716	0.0566	0.0199	0.0217	0.0041	0.0031	0.0034	0.0024	0.0002	0.0002	0.0108	0.0104

Notes: Dependent variable: Government Credit from MFI's in growth rates (log differences); UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). For reasons of parsimony, only the variables of interest (monetary policy related) are presented. Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.17: Credit to Pension Funds and Unconventional Monetary Policy effects

Interaction Matrix (W):	Dependent variable Pension Funds													
	Trade		Portfolio		Credit		Socioeconomic		FDI		Debt to GDP		Deficit to GDP	
Independent Variables														
UMP Announcements (-1)	0.000669		-0.00324		0.000347		0.000157		0.000190		0.000166		0.000266	
	(0.00434)		(0.00511)		(0.00477)		(0.00478)		(0.00480)		(0.00480)		(0.00480)	
UMP Announcements (+1)		-0.0128		-0.0101		-0.0125		-0.0117		-0.0117		-0.0117		-0.0123
		(0.0131)		(0.0114)		(0.0128)		(0.0124)		(0.0124)		(0.0123)		(0.0126)
CMP Announcements	-0.0167**	-0.0146**	-0.0172***	-0.0151**	-0.0194***	-0.0173**	-0.0195***	-0.0175***	-0.0194***	-0.0174***	-0.0195***	-0.0175***	-0.0188***	-0.0167**
	(0.00673)	(0.00727)	(0.00662)	(0.00689)	(0.00670)	(0.00694)	(0.00661)	(0.00673)	(0.00661)	(0.00673)	(0.00662)	(0.00673)	(0.00671)	(0.00697)
Monetary Policy Index	-0.00218	-0.00172	-0.00256	-0.00226	-0.00271	-0.00226	-0.00285	-0.00243	-0.00283	-0.00241	-0.00286	-0.00243	-0.00277	-0.00233
	(0.00301)	(0.00286)	(0.00318)	(0.00319)	(0.00290)	(0.00271)	(0.00310)	(0.00291)	(0.00309)	(0.00290)	(0.00310)	(0.00291)	(0.00308)	(0.00289)
PSP	0.00177	0.00174	0.00163	0.00142	0.00121	0.00117	0.000887	0.000865	0.000880	0.000860	0.000898	0.000878	0.000952	0.000927
	(0.00524)	(0.00512)	(0.00513)	(0.00512)	(0.00540)	(0.00527)	(0.00576)	(0.00562)	(0.00576)	(0.00562)	(0.00577)	(0.00563)	(0.00575)	(0.00561)
Short-run direct effects														
UMP Announcements (-1)	0.000805		-0.00307		0.000480		0.000283		0.000317		0.000290		0.000392	
	(0.00439)		(0.00516)		(0.00468)		(0.00467)		(0.00468)		(0.00468)		(0.00471)	
UMP Announcements (+1)		-0.0123		-0.00972		-0.0120		-0.0112		-0.0112		-0.0112		-0.0118
		(0.0128)		(0.0111)		(0.0126)		(0.0122)		(0.0122)		(0.0122)		(0.0125)
CMP Announcements	-0.0167**	-0.0148*	-0.0172**	-0.0153**	-0.0194***	-0.0175**	-0.0194***	-0.0177**	-0.0194***	-0.0176**	-0.0195***	-0.0177**	-0.0188***	-0.0169**
	(0.00713)	(0.00757)	(0.00695)	(0.00717)	(0.00700)	(0.00727)	(0.00688)	(0.00705)	(0.00688)	(0.00704)	(0.00688)	(0.00705)	(0.00699)	(0.00726)
Monetary Policy Index	-0.00209	-0.00164	-0.00243	-0.00216	-0.00263	-0.00218	-0.00275	-0.00235	-0.00274	-0.00233	-0.00276	-0.00235	-0.00267	-0.00224
	(0.00291)	(0.00274)	(0.00305)	(0.00304)	(0.00275)	(0.00255)	(0.00295)	(0.00275)	(0.00294)	(0.00274)	(0.00295)	(0.00274)	(0.00294)	(0.00274)
PSP	0.00155	0.00165	0.00145	0.00132	0.000982	0.00109	0.000663	0.000772	0.000654	0.000766	0.000678	0.000787	0.000730	0.000836
	(0.00546)	(0.00529)	(0.00538)	(0.00536)	(0.00560)	(0.00547)	(0.00600)	(0.00589)	(0.00600)	(0.00590)	(0.00601)	(0.00590)	(0.00600)	(0.00589)

Short-run indirect effects														
UMP Announcements (-1)	4.73e-05		-0.000304		-1.10e-05		2.78e-05		2.68e-05		3.07e-05		1.11e-05	
	(0.000217)		(0.000491)		(0.000258)		(0.000210)		(0.000199)		(0.000205)		(0.000164)	
UMP Announcements (+1)		-0.000564		-0.000864		0.000746		0.000622		0.000596		0.000607		0.000494
		(0.000709)		(0.00108)		(0.000872)		(0.000779)		(0.000757)		(0.000750)		(0.000599)
CMP Announcements	-0.000756	-0.000655	-0.00132*	-0.00122	0.00104	0.000982	0.000801	0.000782	0.000730	0.000718	0.000793	0.000776	0.000613	0.000613
	(0.000582)	(0.000543)	(0.000765)	(0.000778)	(0.000754)	(0.000723)	(0.000705)	(0.000658)	(0.000685)	(0.000640)	(0.000680)	(0.000634)	(0.000519)	(0.000497)
Monetary Policy Index	-7.88e-05	-6.06e-05	-0.000212	-0.000197	0.000149	0.000134	0.000148	0.000139	0.000141	0.000134	0.000142	0.000134	0.000102	9.88e-05
	(0.000149)	(0.000138)	(0.000291)	(0.000290)	(0.000175)	(0.000168)	(0.000180)	(0.000171)	(0.000173)	(0.000165)	(0.000173)	(0.000165)	(0.000127)	(0.000125)
PSPP	6.00e-05	6.31e-05	7.12e-05	6.28e-05	-6.69e-05	-6.74e-05	-3.53e-05	-3.44e-05	-2.94e-05	-2.79e-05	-4.41e-05	-4.28e-05	-3.88e-05	-3.73e-05
	(0.000285)	(0.000272)	(0.000462)	(0.000493)	(0.000323)	(0.000329)	(0.000282)	(0.000304)	(0.000267)	(0.000291)	(0.000274)	(0.000297)	(0.000217)	(0.000235)
Short-run Total effects														
UMP Announcements (-1)	0.000853		-0.00337		0.000469		0.000311		0.000343		0.000321		0.000403	
	(0.00458)		(0.00561)		(0.00446)		(0.00451)		(0.00454)		(0.00452)		(0.00458)	
UMP Announcements (+1)		-0.0128		-0.0106		-0.0112		-0.0106		-0.0106		-0.0106		-0.0113
		(0.0133)		(0.0120)		(0.0119)		(0.0116)		(0.0116)		(0.0116)		(0.0120)
CMP Announcements	-0.0175**	-0.0154*	-0.0186**	-0.0165**	-0.0183***	-0.0165**	-0.0186***	-0.0169**	-0.0186***	-0.0169**	-0.0187***	-0.0169**	-0.0182***	-0.0163**
	(0.00750)	(0.00794)	(0.00746)	(0.00773)	(0.00643)	(0.00676)	(0.00642)	(0.00667)	(0.00646)	(0.00670)	(0.00643)	(0.00667)	(0.00662)	(0.00694)
Monetary Policy Index	-0.00217	-0.00170	-0.00264	-0.00236	-0.00248	-0.00205	-0.00261	-0.00221	-0.00260	-0.00220	-0.00262	-0.00221	-0.00257	-0.00215
	(0.00303)	(0.00286)	(0.00331)	(0.00331)	(0.00260)	(0.00241)	(0.00281)	(0.00262)	(0.00281)	(0.00261)	(0.00281)	(0.00261)	(0.00284)	(0.00263)
PSPP	0.00161	0.00172	0.00152	0.00138	0.000915	0.00103	0.000627	0.000737	0.000625	0.000738	0.000633	0.000745	0.000691	0.000799
	(0.00570)	(0.00552)	(0.00581)	(0.00582)	(0.00531)	(0.00518)	(0.00577)	(0.00564)	(0.00579)	(0.00566)	(0.00578)	(0.00565)	(0.00582)	(0.00569)
Long-run direct effects														
UMP Announcements (-1)	0.000657		-0.00251		0.000392		0.000230		0.000258		0.000237		0.000320	

	(0.00358)		(0.00422)		(0.00382)		(0.00381)		(0.00382)		(0.00382)		(0.00384)	
UMP Announcements (+1)	-0.0100		-0.00795		-0.00977		-0.00916		-0.00912		-0.00916		-0.00959	
	(0.0104)		(0.00904)		(0.0103)		(0.00997)		(0.00997)		(0.00994)		(0.0102)	
CMP Announcements	-0.0136**	-0.0121*	-0.0141**	-0.0125**	-0.0158***	-0.0143**	-0.0159***	-0.0144**	-0.0158***	-0.0144**	-0.0159***	-0.0144**	-0.0153***	-0.0138**
	(0.00582)	(0.00618)	(0.00569)	(0.00586)	(0.00571)	(0.00593)	(0.00561)	(0.00575)	(0.00561)	(0.00575)	(0.00562)	(0.00575)	(0.00570)	(0.00593)
Monetary Policy Index	-0.00170	-0.00134	-0.00199	-0.00177	-0.00215	-0.00178	-0.00225	-0.00192	-0.00223	-0.00190	-0.00225	-0.00192	-0.00218	-0.00183
	(0.00238)	(0.00224)	(0.00249)	(0.00249)	(0.00224)	(0.00208)	(0.00241)	(0.00225)	(0.00240)	(0.00224)	(0.00240)	(0.00224)	(0.00240)	(0.00223)
PSPP	0.00127	0.00135	0.00119	0.00108	0.000801	0.000892	0.000541	0.000630	0.000534	0.000625	0.000553	0.000643	0.000595	0.000682
	(0.00445)	(0.00431)	(0.00440)	(0.00438)	(0.00457)	(0.00446)	(0.00489)	(0.00481)	(0.00489)	(0.00481)	(0.00490)	(0.00482)	(0.00489)	(0.00480)
Long-run indirect effects														
UMP Announcements (-1)	5.27e-05		0.000322		-3.85e-05		-1.21e-05		-1.57e-05		-1.18e-05		-2.07e-05	
	(0.000250)		(0.000578)		(0.000452)		(0.000539)		(0.000530)		(0.000547)		(0.000407)	
UMP Announcements (+1)	-0.000710		0.000970		0.00119		0.00136		0.00134		0.00138		0.00106	
	(0.000780)		(0.00114)		(0.00127)		(0.00149)		(0.00147)		(0.00149)		(0.00113)	
CMP Announcements	-0.000938*	-0.000839	0.00198**	0.00158**	0.00190**	0.00168**	0.00229**	0.00204**	0.00223**	0.00199**	0.00232**	0.00207**	0.00165**	0.00147**
	(0.000529)	(0.000529)	(0.000861)	(0.000796)	(0.000858)	(0.000824)	(0.000957)	(0.000909)	(0.000935)	(0.000887)	(0.000960)	(0.000913)	(0.000728)	(0.000705)
Monetary Policy Index	-0.000106	-8.48e-05	0.000269	0.000213	0.000262	0.000216	0.000342	0.000290	0.000335	0.000285	0.000344	0.000292	0.000243	0.000205
	(0.000167)	(0.000160)	(0.000346)	(0.000313)	(0.000274)	(0.000251)	(0.000363)	(0.000332)	(0.000356)	(0.000326)	(0.000365)	(0.000334)	(0.000265)	(0.000244)
PSPP	8.01e-05	8.68e-05	-0.000184	-0.000156	-0.000105	-0.000109	-8.23e-05	-8.93e-05	-7.79e-05	-8.49e-05	-8.96e-05	-9.67e-05	-7.27e-05	-7.68e-05
	(0.000321)	(0.000315)	(0.000619)	(0.000549)	(0.000548)	(0.000525)	(0.000702)	(0.000683)	(0.000688)	(0.000671)	(0.000711)	(0.000691)	(0.000524)	(0.000511)
Long-run total effects														
UMP Announcements (-1)	0.000709		-0.00219		0.000353		0.000218		0.000242		0.000225		0.000299	
	(0.00382)		(0.00365)		(0.00337)		(0.00327)		(0.00330)		(0.00328)		(0.00344)	
UMP Announcements (+1)	-0.0107		-0.00698		-0.00858		-0.00779		-0.00778		-0.00778		-0.00853	

		(0.0111)		(0.00793)		(0.00907)		(0.00850)		(0.00852)		(0.00847)		(0.00905)
CMP Announcements	-0.0146**	-0.0129*	-0.0121**	-0.0109**	-0.0139***	-0.0126**	-0.0136***	-0.0124**	-0.0136***	-0.0124**	-0.0136***	-0.0124**	-0.0137***	-0.0123**
	(0.00625)	(0.00663)	(0.00487)	(0.00511)	(0.00491)	(0.00517)	(0.00471)	(0.00490)	(0.00473)	(0.00492)	(0.00470)	(0.00489)	(0.00500)	(0.00526)
Monetary Policy Index	-0.00181	-0.00143	-0.00172	-0.00155	-0.00188	-0.00157	-0.00190	-0.00163	-0.00190	-0.00162	-0.00191	-0.00163	-0.00193	-0.00163
	(0.00253)	(0.00239)	(0.00215)	(0.00218)	(0.00197)	(0.00184)	(0.00205)	(0.00192)	(0.00205)	(0.00192)	(0.00204)	(0.00191)	(0.00214)	(0.00199)
PSPP	0.00135	0.00144	0.00100	0.000923	0.000696	0.000783	0.000458	0.000540	0.000456	0.000540	0.000463	0.000546	0.000522	0.000605
	(0.00476)	(0.00461)	(0.00379)	(0.00384)	(0.00402)	(0.00395)	(0.00420)	(0.00413)	(0.00421)	(0.00415)	(0.00419)	(0.00413)	(0.00438)	(0.00430)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LogL	378.7688	379.6175	382.5555	383.0319	379.3631	380.1609	379.754	380.4571	379.7637	380.4609	379.775	380.4783	379.1266	379.8981
No. of countries/observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.2248	0.2148	0.4191	0.4097	0.1421	0.1301	0.2909	0.2789	0.3283	0.3166	0.3480	0.3358	0.4835	0.4668

Notes: Dependent variable: Credit to Pension Funds from MFI's in growth rates (log differences); UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). For reasons of parsimony, only the variables of interest (monetary policy related) are presented. Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.18: MFI's credit to households and Unconventional Monetary Policy effects (excluding credit for house purchase)

Interaction Matrix (W):	Dependent variable Credit to Households excluding credit for House Purchase													
	Trade		Portfolio		Credit		Socioeconomic		FDI		Debt to GDP		Deficit to GDP	
Independent Variables														
UMP Announcements (-1)	9.89e-05		9.98e-05		0.00013		0.000122		0.000124		0.000123		0.000592	
	(0.000243)		(0.000245)		-0.000243		(0.000242)		-0.000242		(0.000242)		(0.000669)	
UMP Announcements (+1)		0.000500		0.000509		0.000592		0.000592		0.000592		0.000592		0.000592
		(0.000688)		(0.000674)		(0.000669)		(0.000669)		(0.000669)		(0.000669)		(0.000669)
CMP Announcements	-0.000491	-0.00124*	-0.000806**	-0.00123*	-0.000605	-0.00138**	-0.000619	-0.00138**	-0.000656	-0.00138**	-0.000691	-0.00138**	-0.00138**	-0.00138**
	(0.000389)	(0.000679)	(0.000396)	(0.000651)	-0.000422	(0.000619)	(0.000474)	(0.000619)	-0.000475	(0.000619)	(0.000463)	(0.000619)	(0.000619)	(0.000619)
Monetary Policy Index	0.000119	0.000455	0.000130	0.000450	0.000127	0.000468	0.000146	0.000468	0.000145	0.000468	0.000146	0.000468	0.000468	0.000468
	(0.000102)	(0.000345)	(0.000106)	(0.000346)	-0.000105	(0.000340)	(0.000108)	(0.000340)	-0.000108	(0.000340)	(0.000108)	(0.000340)	(0.000340)	(0.000340)
PSPP	-0.000252	-0.00157*	-0.000295	-0.00154*	-0.000275	-0.00151*	-0.000277	-0.00151*	-0.000282	-0.00151*	-0.000291	-0.00151*	-0.00151*	-0.00151*
	(0.000222)	(0.000863)	(0.000246)	(0.000866)	-0.000242	(0.000859)	(0.000236)	(0.000859)	-0.000237	(0.000859)	(0.000240)	(0.000859)	(0.000859)	(0.000859)
Short-run direct effects														
UMP Announcements (-1)	0.000112		0.000114		0.000145		0.000137		0.000138		0.000137		0.000602	
	(0.000247)		(0.000247)		-0.000242		(0.000242)		-0.000243		(0.000244)		(0.000692)	
UMP Announcements (+1)		0.000505		0.000520		0.000602		0.000602		0.000602		0.000602		0.000602
		(0.000722)		(0.000704)		(0.000692)		(0.000692)		(0.000692)		(0.000692)		(0.000692)
CMP Announcements	-0.000496	-0.00126*	-0.000809**	-0.00125*	-0.000606	-0.00139**	-0.000616	-0.00139**	-0.000652	-0.00139**	-0.000688	-0.00139**	-0.00139**	-0.00139**
	(0.000371)	(0.000711)	(0.000373)	(0.000680)	-0.000404	(0.000658)	(0.000449)	(0.000658)	-0.000451	(0.000658)	(0.000440)	(0.000658)	(0.000658)	(0.000658)
Monetary Policy Index	0.000119	0.000468	0.000130	0.000462	0.000127	0.000481	0.000147	0.000481	0.000146	0.000481	0.000147	0.000481	0.000481	0.000481
	(9.56e-05)	(0.000366)	(9.86e-05)	(0.000351)	-0.0000971	(0.000335)	(0.000101)	(0.000335)	-0.000101	(0.000335)	(0.000103)	(0.000335)	(0.000335)	(0.000335)
PSPP	-0.000270	-0.00162*	-0.000314	-0.00159*	-0.000293	-0.00156*	-0.000291	-0.00156*	-0.000296	-0.00156*	-0.000306	-0.00156*	-0.00156*	-0.00156*

	(0.000218)	(0.000866)	(0.000239)	(0.000832)	-0.000238	(0.000823)	(0.000235)	(0.000823)	-0.000236	(0.000823)	(0.000241)	(0.000823)	(0.000823)	(0.000823)
Short-run indirect effects														
UMP Announcements (-1)	1.97e-05		1.58e-05		2.53E-05		2.25e-05		1.88E-05		1.60e-05		-5.06e-05	
	(4.84e-05)		(3.67e-05)		-4.07E-05		(4.04e-05)		-3.63E-05		(3.10e-05)		(0.000101)	
UMP Announcements (+1)		8.17e-06		2.77e-05		-5.06e-05		-5.06e-05		-5.06e-05		-5.06e-05		-5.06e-05
		(3.06e-05)		(0.000102)		(0.000101)		(0.000101)		(0.000101)		(0.000101)		(0.000101)
CMP Announcements	-0.000102	-6.75e-05	-0.000120	-0.000215	-8.65E-05	5.76e-05	-5.18e-05	5.76e-05	-3.63E-05	5.76e-05	-3.77e-05	5.76e-05	5.76e-05	5.76e-05
	(9.02e-05)	(6.94e-05)	(7.53e-05)	(0.000235)	-5.76E-05	(0.000159)	(5.34e-05)	(0.000159)	-5.26E-05	(0.000159)	(4.49e-05)	(0.000159)	(0.000159)	(0.000159)
Monetary Policy Index	2.20e-05	2.24e-05	1.88e-05	7.51e-05	2.08E-05	-2.55e-05	1.82e-05	-2.55e-05	1.41E-05	-2.55e-05	1.24e-05	-2.55e-05	-2.55e-05	-2.55e-05
	(1.86e-05)	(2.52e-05)	(1.59e-05)	(8.99e-05)	-1.77E-05	(6.54e-05)	(1.86e-05)	(6.54e-05)	-1.76E-05	(6.54e-05)	(1.50e-05)	(6.54e-05)	(6.54e-05)	(6.54e-05)
PSPP	-5.19e-05	-6.32e-05	-4.43e-05	-0.000219	-4.69E-05	0.000106	-3.74e-05	0.000106	-2.94E-05	0.000106	-2.62e-05	0.000106	0.000106	0.000106
	(4.61e-05)	(5.54e-05)	(3.74e-05)	(0.000222)	-4.11E-05	(0.000198)	(4.21e-05)	(0.000198)	-3.92E-05	(0.000198)	(3.41e-05)	(0.000198)	(0.000198)	(0.000198)
Short-run Total effects														
UMP Announcements (-1)	0.000131		0.000130		1.70E-04		0.000159		1.57E-04		0.000153		0.000551	
	(0.000293)		(0.000281)		-2.81E-04		(0.000276)		-2.71E-04		(0.000268)		(0.000645)	
UMP Announcements (+1)		0.000513		0.000547		0.000551		0.000551		0.000551		0.000551		0.000551
		(0.000743)		(0.000768)		(0.000645)		(0.000645)		(0.000645)		(0.000645)		(0.000645)
CMP Announcements	-0.000598	-0.00133*	-0.000930**	-0.00146*	-6.92E-04	-0.00134*	-0.000668	-0.00134*	-6.88E-04	-0.00134*	-0.000725	-0.00134*	-0.00134*	-0.00134*
	(0.000455)	(0.000773)	(0.000437)	(0.000886)	-4.56E-04	(0.000692)	(0.000472)	(0.000692)	-4.57E-04	(0.000692)	(0.000444)	(0.000692)	(0.000692)	(0.000692)
Monetary Policy Index	0.000141	0.000491	0.000149	0.000538	1.48E-04	0.000456	0.000165	0.000456	1.60E-04	0.000456	0.000159	0.000456	0.000456	0.000456
	(0.000113)	(0.000385)	(0.000113)	(0.000424)	-1.14E-04	(0.000325)	(0.000114)	(0.000325)	-1.12E-04	(0.000325)	(0.000112)	(0.000325)	(0.000325)	(0.000325)
PSPP	-0.000322	-0.00168*	-0.000358	-0.00181*	-3.40E-04	-0.00146*	-0.000329	-0.00146*	-3.26E-04	-0.00146*	-0.000332	-0.00146*	-0.00146*	-0.00146*
	(0.000261)	(0.000896)	(0.000273)	(0.000982)	-2.76E-04	(0.000760)	(0.000266)	(0.000760)	-2.60E-04	(0.000760)	(0.000261)	(0.000760)	(0.000760)	(0.000760)
Long-run direct effects														

UMP Announcements (-1)	0.000126		0.000129		1.64E-04		0.000155		1.57E-04		0.000155		0.000603	
	(0.000278)		(0.000280)		-2.74E-04		(0.000274)		-2.76E-04		(0.000276)		(0.000693)	
UMP Announcements (+1)		0.000506		0.000521		0.000603		0.000603		0.000603		0.000603		0.000603
		(0.000723)		(0.000705)		(0.000693)		(0.000693)		(0.000693)		(0.000693)		(0.000693)
CMP Announcements	-0.000558	-0.00126*	-0.000918**	-0.00125*	-6.86E-04	-0.00140**	-0.000697	-0.00140**	-7.37E-04	-0.00140**	-0.000778	-0.00140**	-0.00140**	-0.00140**
	(0.000418)	(0.000713)	(0.000423)	(0.000681)	-4.58E-04	(0.000660)	(0.000507)	(0.000660)	-5.09E-04	(0.000660)	(0.000497)	(0.000660)	(0.000660)	(0.000660)
Monetary Policy Index	0.000134	0.000469	0.000147	0.000463	1.44E-04	0.000482	0.000166	0.000482	1.65E-04	0.000482	0.000166	0.000482	0.000482	0.000482
	(0.000107)	(0.000366)	(0.000112)	(0.000352)	-1.10E-04	(0.000336)	(0.000115)	(0.000336)	-1.15E-04	(0.000336)	(0.000117)	(0.000336)	(0.000336)	(0.000336)
PSPP	-0.000303	-0.00162*	-0.000356	-0.00160*	-3.32E-04	-0.00157*	-0.000330	-0.00157*	-3.36E-04	-0.00157*	-0.000346	-0.00157*	-0.00157*	-0.00157*
	(0.000245)	(0.000868)	(0.000271)	(0.000833)	-2.69E-04	(0.000824)	(0.000267)	(0.000824)	-2.68E-04	(0.000824)	(0.000273)	(0.000824)	(0.000824)	(0.000824)

Long-run indirect effects

UMP Announcements (-1)	4.48e-05		2.63e-05		7.90E-05		7.08e-05		6.32E-05		5.19e-05		-2.30e-05	
	(0.000106)		(6.02e-05)		-1.28E-04		(0.000121)		-1.10E-04		(9.09e-05)		(9.67e-05)	
UMP Announcements (+1)		2.08e-05		8.34e-06		-2.30e-05		-2.30e-05		-2.30e-05		-2.30e-05		-2.30e-05
		(4.56e-05)		(8.37e-05)		(9.67e-05)		(9.67e-05)		(9.67e-05)		(9.67e-05)		(9.67e-05)
CMP Announcements	-0.000223	-0.000101	-0.000199*	-0.000159	-2.92E-04	-1.24e-05	-0.000223	-1.24e-05	-1.99E-04	-1.24e-05	-0.000184*	-1.24e-05	-1.24e-05	-1.24e-05
	(0.000187)	(8.83e-05)	(0.000118)	(0.000200)	-1.90E-04	(0.000183)	(0.000161)	(0.000183)	-1.39E-04	(0.000183)	(0.000112)	(0.000183)	(0.000183)	(0.000183)
Monetary Policy Index	4.92e-05	3.49e-05	3.11e-05	5.45e-05	6.66E-05	-1.89e-06	6.43e-05	-1.89e-06	5.58E-05	-1.89e-06	4.72e-05	-1.89e-06	-1.89e-06	-1.89e-06
	(4.03e-05)	(3.37e-05)	(2.55e-05)	(7.52e-05)	-5.34E-05	(6.99e-05)	(5.15e-05)	(6.99e-05)	-4.75E-05	(6.99e-05)	(3.95e-05)	(6.99e-05)	(6.99e-05)	(6.99e-05)
PSPP	-0.000115	-0.000106	-7.35e-05	-0.000151	-1.51E-04	3.17e-05	-0.000130	3.17e-05	-1.15E-04	3.17e-05	-9.88e-05	3.17e-05	3.17e-05	3.17e-05
	(9.82e-05)	(7.11e-05)	(6.05e-05)	(0.000192)	-1.27E-04	(0.000203)	(0.000118)	(0.000203)	-1.08E-04	(0.000203)	(9.03e-05)	(0.000203)	(0.000203)	(0.000203)

Long-run total effects

UMP Announcements (-1)	0.000170		0.000155		2.43E-04		0.000226		2.20E-04		0.000207		0.000580	
	(0.000381)		(0.000337)		-4.01E-04		(0.000389)		-3.78E-04		(0.000361)		(0.000680)	

UMP Announcements (+1)		0.000527		0.000529		0.000580		0.000580		0.000580		0.000580		0.000580
		(0.000762)		(0.000741)		(0.000680)		(0.000680)		(0.000680)		(0.000680)		(0.000680)
CMP Announcements	-0.000781	-0.00136*	-0.00112**	-0.00141*	-9.78E-04	-0.00141*	-0.000919	-0.00141*	-9.36E-04	-0.00141*	-0.000963*	-0.00141*	-0.00141*	-0.00141*
	(0.000599)	(0.000795)	(0.000528)	(0.000850)	-6.42E-04	(0.000734)	(0.000645)	(0.000734)	-6.17E-04	(0.000734)	(0.000582)	(0.000734)	(0.000734)	(0.000734)
Monetary Policy Index	0.000183	0.000504	0.000178	0.000518	2.11E-04	0.000481	0.000230	0.000481	2.21E-04	0.000481	0.000214	0.000481	0.000481	0.000481
	(0.000146)	(0.000396)	(0.000135)	(0.000408)	-1.62E-04	(0.000343)	(0.000161)	(0.000343)	-1.56E-04	(0.000343)	(0.000151)	(0.000343)	(0.000343)	(0.000343)
PSPP	-0.000419	-0.00173*	-0.000429	-0.00175*	-4.83E-04	-0.00154*	-0.000461	-0.00154*	-4.51E-04	-0.00154*	-0.000445	-0.00154*	-0.00154*	-0.00154*
	(0.000340)	(0.000920)	(0.000327)	(0.000945)	-0.000393	(0.000802)	(0.000374)	(0.000802)	-0.000361	(0.000802)	(0.000351)	(0.000802)	(0.000802)	(0.000802)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LogL	9616.0795	6385.9137	9595.9031	6387.0523	9601.558	6385.9791	9597.8918	6385.2969	9596.7832	6385.2296	9595.9794	6385.2296	9597.3326	6397.6697
No. of countries/observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.0026	0.0339	0.0749	0.0735	0.2439	0.2377	0.0352	0.0328	0.0327	0.0305	0.0381	0.0271	0.256	0.2409

Notes: Dependent variable: Credit to Households excluding credit for House Purchase from MFI's in growth rates (log differences); UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the -xsmle- Stata command (Belotti et al., 2017). For reasons of parsimony, only the variables of interest (monetary policy related) are presented. Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.19: MFI's credit to households and Unconventional Monetary Policy effects (including credit for house purchase)

Interaction Matrix (W):	Dependent variable Credit to Households for House Purchase													
	Trade		Portfolio		Credit		Socioeconomic		FDI		Debt to GDP		Deficit to GDP	
Independent Variables														
UMP Announcements (-1)	0.00648		0.0000998		0.000130		0.000122		0.000124		0.000123		0.000116	
	(0.00418)		-0.000245		(0.000243)		(0.000242)		(0.000242)		(0.000242)		(0.000245)	
UMP Announcements (+1)		0.000500		0.0000111		0.0000413		0.0000444		0.0000438		0.0000349		0.0000359
		(0.000688)		-0.000206		-0.000214		-0.000209		-0.000209		-0.000209		-0.000207
CMP Announcements	9.89e-05	-0.00124*	-0.000806**	-0.000818**	-0.000605	-0.000624	-0.000619	-0.000637	-0.000656	-0.000674	-0.000691	-0.000709	-0.000652	-0.000669
	(0.000243)	(0.000679)	-0.000396	-0.000402	(0.000422)	-0.000427	(0.000474)	-0.000479	(0.000475)	-0.00048	(0.000463)	-0.000469	(0.000492)	-0.000498
Monetary Policy Index	-0.000491	0.000455	0.00013	0.000132	0.000127	0.000129	0.000146	0.000148	0.000145	0.000147	0.000146	0.000148	0.000148	0.00015
	(0.000389)	(0.000345)	-0.000106	-0.000101	(0.000105)	-0.000101	(0.000108)	-0.000104	(0.000108)	-0.000104	(0.000108)	-0.000104	(0.000108)	-0.000103
PSPP	0.000119	-0.00157*	-0.000295	-0.000291	-0.000275	-0.000269	-0.000277	-0.000271	-0.000282	-0.000276	-0.000291	-0.000285	-0.000283	-0.000277
	(0.000102)	(0.000863)	-0.000246	-0.000241	(0.000242)	-0.000237	(0.000236)	-0.000231	(0.000237)	-0.000232	(0.000240)	-0.000235	(0.000236)	-0.000231
Short-run direct effects														
UMP Announcements (-1)	0.00635		0.000114		0.000145		0.000137		0.000138		0.000137		0.000132	
	(0.00420)		-0.000247		(0.000242)		(0.000242)		(0.000243)		(0.000244)		(0.000240)	
UMP Announcements (+1)		0.000505		0.00002		0.0000459		0.000049		0.0000483		0.00004		0.0000402
		(0.000722)		-0.000204		-0.000216		-0.000214		-0.000213		-0.000214		-0.000213
CMP Announcements	0.000112	-0.00126*	-0.000809**	-0.000818**	-0.000606	-0.000618	-0.000616	-0.000631	-0.000652	-0.000667	-0.000688	-0.000703	-0.000654	-0.000671
	(0.000247)	(0.000711)	-0.000373	-0.000378	(0.000404)	-0.000404	(0.000449)	-0.00045	(0.000451)	-0.000453	(0.000440)	-0.000444	(0.000462)	-0.000468
Monetary Policy Index	-0.000496	0.000468	0.00013	0.000136	0.000127	0.000134	0.000147	0.000152	0.000146	0.000151	0.000147	0.000152	0.000148	0.000152
	(0.000371)	(0.000366)	-0.0000986	-0.0000988	(9.71e-05)	-0.000101	(0.000101)	-0.000102	(0.000101)	-0.000102	(0.000103)	-0.000104	(0.000101)	-0.0000983
PSPP	0.000119	-0.00162*	-0.000314	-0.000305	-0.000293	-0.000283	-0.000291	-0.000282	-0.000296	-0.000286	-0.000306	-0.000296	-0.000299	-0.000291
	(9.56e-05)	(0.000866)	-0.000239	-0.000236	(0.000238)	-0.000234	(0.000235)	-0.000232	(0.000236)	-0.000233	(0.000241)	-0.000237	(0.000230)	-0.000226

Short-run indirect effects														
UMP Announcements (-1)	0.00119		1.58E-05		2.53e-05		2.25e-05		1.88e-05		1.60e-05		1.03e-05	
	(0.000864)		-3.67E-05		(4.07e-05)		(4.04e-05)		(3.63e-05)		(3.10e-05)		(2.60e-05)	
UMP Announcements (+1)		8.17e-06		4.40E-06		2.75E-06		-3.17E-06		-5.13E-06		-5.78E-06		-3.91E-06
		(3.06e-05)		-3.07E-05		-3.51E-05		-3.20E-05		-2.83E-05		-2.48E-05		-2.04E-05
CMP Announcements	1.97e-05	-6.75e-05	-1.20E-04	-1.23E-04	-8.65e-05	-8.83E-05	-5.18e-05	-5.23E-05	-3.63e-05	-3.62E-05	-3.77e-05	-3.72E-05	-1.89e-05	-1.92E-05
	(4.84e-05)	(6.94e-05)	-7.53E-05	-7.68E-05	(5.76e-05)	-5.67E-05	(5.34e-05)	-5.45E-05	(5.26e-05)	-5.39E-05	(4.49e-05)	-4.65E-05	(4.62e-05)	-4.81E-05
Monetary Policy Index	-0.000102	2.24e-05	1.88E-05	1.99E-05	2.08e-05	2.19E-05	1.82e-05	1.86E-05	1.41e-05	1.44E-05	1.24e-05	1.27E-05	1.07e-05	1.05E-05
	(9.02e-05)	(2.52e-05)	-1.59E-05	-1.66E-05	(1.77e-05)	-1.85E-05	(1.86e-05)	-1.98E-05	(1.76e-05)	-1.90E-05	(1.50e-05)	-1.65E-05	(1.52e-05)	-1.52E-05
PSP	2.20e-05	-6.32e-05	-4.43E-05	-4.35E-05	-4.69e-05	-4.55E-05	-3.74e-05	-3.63E-05	-2.94e-05	-2.85E-05	-2.62e-05	-2.52E-05	-2.03e-05	-2.00E-05
	(1.86e-05)	(5.54e-05)	-3.74E-05	-3.73E-05	(4.11e-05)	-4.11E-05	(4.21e-05)	-4.28E-05	(3.92e-05)	-3.98E-05	(3.41e-05)	-3.45E-05	(3.22e-05)	-3.25E-05
Short-run Total effects														
UMP Announcements (-1)	0.00755		1.30E-04		0.000170		0.000159		0.000157		0.000153		0.000142	
	(0.00497)		-2.81E-04		(0.000281)		(0.000276)		(0.000271)		(0.000268)		(0.000257)	
UMP Announcements (+1)		0.000513		2.44E-05		4.86E-05		4.58E-05		4.31E-05		3.42E-05		3.63E-05
		(0.000743)		-2.34E-04		-2.50E-04		-2.40E-04		-2.34E-04		-2.32E-04		-2.26E-04
CMP Announcements	0.000131	-0.00133*	-0.000930**	-0.000941**	-0.000692	-7.06E-04	-0.000668	-6.83E-04	-0.000688	-7.03E-04	-0.000725	-0.000740*	-0.000673	-6.90E-04
	(0.000293)	(0.000773)	-4.37E-04	-4.43E-04	(0.000456)	-4.55E-04	(0.000472)	-4.73E-04	(0.000457)	-4.58E-04	(0.000444)	-4.47E-04	(0.000462)	-4.67E-04
Monetary Policy Index	-0.000598	0.000491	1.49E-04	1.56E-04	0.000148	1.55E-04	0.000165	1.70E-04	0.000160	1.66E-04	0.000159	1.65E-04	0.000159	1.63E-04
	(0.000455)	(0.000385)	-1.13E-04	-1.13E-04	(0.000114)	-1.18E-04	(0.000114)	-1.15E-04	(0.000112)	-1.13E-04	(0.000112)	-1.13E-04	(0.000109)	-1.06E-04
PSP	0.000141	-0.00168*	-3.58E-04	-3.49E-04	-0.000340	-3.28E-04	-0.000329	-3.18E-04	-0.000326	-3.15E-04	-0.000332	-3.21E-04	-0.000319	-3.11E-04
	(0.000113)	(0.000896)	-2.73E-04	-2.69E-04	(0.000276)	-2.73E-04	(0.000266)	-2.62E-04	(0.000260)	-2.57E-04	(0.000261)	-2.58E-04	(0.000247)	-2.43E-04
Long-run direct effects														
UMP Announcements (-1)	0.00715		1.29E-04		0.000164		0.000155		0.000157		0.000155		0.000149	

	(0.00472)		-2.80E-04		(0.000274)		(0.000274)		(0.000276)		(0.000276)		(0.000272)	
UMP Announcements (+1)	0.000506		2.27E-05		5.17E-05		5.51E-05		5.43E-05		4.50E-05		4.52E-05	
	(0.000723)		-2.32E-04		-2.45E-04		-2.42E-04		-2.42E-04		-2.42E-04		-2.41E-04	
CMP Announcements	0.000126	-0.00126*	-0.000918**	-0.000928**	-0.000686	-7.00E-04	-0.000697	-7.13E-04	-0.000737	-7.54E-04	-0.000778	-7.95E-04	-0.000741	-7.60E-04
	(0.000278)	(0.000713)	-4.23E-04	-4.28E-04	(0.000458)	-4.57E-04	(0.000507)	-5.09E-04	(0.000509)	-5.12E-04	(0.000497)	-5.02E-04	(0.000523)	-5.29E-04
Monetary Policy Index	-0.000558	0.000469	1.47E-04	1.54E-04	0.000144	1.51E-04	0.000166	1.72E-04	0.000165	1.71E-04	0.000166	1.73E-04	0.000168	1.73E-04
	(0.000418)	(0.000366)	-1.12E-04	-1.12E-04	(0.000110)	-1.14E-04	(0.000115)	-1.16E-04	(0.000115)	-1.15E-04	(0.000117)	-1.18E-04	(0.000114)	-1.11E-04
PSPP	0.000134	-0.00162*	-3.56E-04	-3.46E-04	-0.000332	-3.20E-04	-0.000330	-3.19E-04	-0.000336	-3.24E-04	-0.000346	-3.36E-04	-0.000339	-3.30E-04
	(0.000107)	(0.000868)	-2.71E-04	-2.68E-04	(0.000269)	-2.66E-04	(0.000267)	-2.62E-04	(0.000268)	-2.64E-04	(0.000273)	-2.69E-04	(0.000261)	-2.56E-04
Long-run indirect effects														
UMP Announcements (-1)	0.00266		2.63E-05		7.90e-05		7.08e-05		6.32e-05		5.19e-05		5.24e-05	
	(0.00184)		-6.02E-05		(0.000128)		(0.000121)		(0.000110)		(9.09e-05)		(9.90e-05)	
UMP Announcements (+1)	2.08e-05		6.92E-06		1.46E-05		3.60E-06		-5.44E-08		-3.46E-06		2.22E-06	
	(4.56e-05)		-5.01E-05		-1.12E-04		-9.97E-05		-8.92E-05		-7.48E-05		-8.33E-05	
CMP Announcements	4.48e-05	-0.000101	-0.000199*	-0.000201*	-0.000292	-2.98E-04	-0.000223	-2.26E-04	-0.000199	-2.02E-04	-0.000184*	-0.000186*	-0.000197	-2.02E-04
	(0.000106)	(8.83e-05)	-1.18E-04	-1.20E-04	(0.000190)	-1.87E-04	(0.000161)	-1.61E-04	(0.000139)	-1.38E-04	(0.000112)	-1.12E-04	(0.000142)	-1.44E-04
Monetary Policy Index	-0.000223	3.49e-05	3.11E-05	3.27E-05	6.66e-05	7.00E-05	6.43e-05	6.62E-05	5.58e-05	5.75E-05	4.72e-05	4.86E-05	5.73e-05	5.80E-05
	(0.000187)	(3.37e-05)	-2.55E-05	-2.65E-05	(5.34e-05)	-5.55E-05	(5.15e-05)	-5.31E-05	(4.75e-05)	-4.93E-05	(3.95e-05)	-4.13E-05	(4.77e-05)	-4.63E-05
PSPP	4.92e-05	-0.000106	-7.35E-05	-7.17E-05	-0.000151	-1.46E-04	-0.000130	-1.26E-04	-0.000115	-1.11E-04	-9.88e-05	-9.52E-05	-0.000113	-1.11E-04
	(4.03e-05)	(7.11e-05)	-6.05E-05	-5.99E-05	(0.000127)	-1.26E-04	(0.000118)	-1.19E-04	(0.000108)	-1.08E-04	(9.03e-05)	-9.02E-05	(0.000103)	-1.03E-04
Long-run total effects														
UMP Announcements (-1)	0.00981		1.55E-04		0.000243		0.000226		0.000220		0.000207		0.000202	
	(0.00646)		-3.37E-04		(0.000401)		(0.000389)		(0.000378)		(0.000361)		(0.000364)	
UMP Announcements (+1)	0.000527		2.96E-05		6.63E-05		5.87E-05		5.43E-05		4.15E-05		4.74E-05	

		(0.000762)		-2.80E-04		-3.55E-04		-3.37E-04		-3.25E-04		-3.12E-04		-3.20E-04
CMP Announcements	0.000170	-0.00136*	-0.00112**	-0.00113**	-0.000978	-9.97E-04	-0.000919	-9.40E-04	-0.000936	-9.56E-04	-0.000963*	-0.000981*	-0.000938	-9.62E-04
	(0.000381)	(0.000795)	-5.28E-04	-5.34E-04	(0.000642)	-6.39E-04	(0.000645)	-6.46E-04	(0.000617)	-6.17E-04	(0.000582)	-5.85E-04	(0.000639)	-6.46E-04
Monetary Policy Index	-0.000781	0.000504	1.78E-04	1.87E-04	0.000211	2.21E-04	0.000230	2.38E-04	0.000221	2.29E-04	0.000214	2.21E-04	0.000226	2.31E-04
	(0.000599)	(0.000396)	-1.35E-04	-1.36E-04	(0.000162)	-1.68E-04	(0.000161)	-1.62E-04	(0.000156)	-1.57E-04	(0.000151)	-1.53E-04	(0.000156)	-1.52E-04
PSPP	0.000183	-0.00173*	-4.29E-04	-4.18E-04	-0.000483	-4.67E-04	-0.000461	-4.45E-04	-0.000451	-4.36E-04	-0.000445	-4.31E-04	-0.000452	-4.41E-04
	(0.000146)	(0.000920)	-0.000327	-0.000323	(0.000393)	-0.000388	(0.000374)	-0.000369	(0.000361)	-0.000357	(0.000351)	-0.000347	(0.000353)	-0.000347
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LogL	9616.0795	6385.9137	9595.9031	9595.8225	9601.558	9601.4318	9597.8918	9597.7844	9596.7832	9596.6712	9595.9794	9595.8645	9597.3326	9597.2319
No. of countries/observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.0612	0.0031	0.0466	0.0594	0.3468	0.3457	0.0143	0.0135	0.0055	0.0049	0.0096	0.0088	0.0849	0.0824

Notes: Dependent variable: Credit to Households for House Purchase from MFI's in growth rates (log differences); UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). For reasons of parsimony, only the variables of interest (monetary policy related) are presented. Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.20: General Consumer credit and Unconventional Monetary Policy effects

Dependent variable Consumer Credit														
Interaction Matrix (W):	Trade		Portfolio		Credit		Socioeconomic		FDI		Debt to GDP		Deficit to GDP	
Independent Variables														
UMP Announcements (-1)	0.000793 (0.000710)		0.000769 -0.000686		0.000734 (0.000698)		0.000627 (0.000669)		0.000618 (0.000669)		0.000658 (0.000669)		0.000683 (0.000689)	
UMP Announcements (+1)		0.000134 (0.000379)		0.000109 -0.000387		0.000112 -0.000398		0.00007 -0.000393		0.0000634 -0.000392		0.000075 -0.000391		0.0000662 -0.000397
CMP Announcements	-0.000996 (0.000669)	-0.00109 (0.000730)	-0.000985 -0.000706	-0.00107 -0.00077	-0.000900 (0.000703)	-0.000983 -0.000767	-0.000792 (0.000701)	-0.000857 -0.000761	-0.000784 (0.000703)	-0.000847 -0.000763	-0.000817 (0.000702)	-0.000886 -0.000761	-0.000820 (0.000703)	-0.000888 -0.000766
Monetary Policy Index	0.000781* ** (0.000248)	0.000800* ** (0.000247)	0.000667* ** -0.000256	0.000685* ** -0.000256	0.000692* ** (0.000254)	0.000711* ** -0.000253	0.000687* ** (0.000266)	0.000703* ** -0.000265	0.000688* ** (0.000266)	0.000705* ** -0.000265	0.000690* ** (0.000266)	0.000707* ** -0.000265	0.000754* ** (0.000263)	0.000773* ** -0.000262
PSPP	0.000623 (0.000407)	0.000658* (0.000394)	0.000533 -0.000399	0.000565 -0.000386	0.000613 (0.000411)	0.000643 -0.000401	0.000591 (0.000409)	0.000617 -0.000398	0.000591 (0.000409)	0.000617 -0.000399	0.000587 (0.000407)	0.000614 -0.000397	0.000605 (0.000411)	0.000633 -0.000399
Short-run direct effects														
UMP Announcements (-1)	0.000834 (0.000688)		0.000809 -0.000656		0.000779 (0.000671)		0.000668 (0.000643)		0.000659 (0.000643)		0.000699 (0.000644)		0.000720 (0.000659)	
UMP Announcements (+1)		0.000145 (0.000387)		0.000118 -0.000392		0.000123 -0.000406		0.0000789 -0.000402		0.0000719 -0.0004		0.0000837 -0.000399		0.0000754 -0.000404
CMP Announcements	-0.00101 (0.000697)	-0.00111 (0.000756)	-0.001 -0.000715	-0.00109 -0.000779	-0.000924 (0.000732)	-0.00101 -0.000797	-0.000814 (0.000721)	-0.00088 -0.000782	-0.000805 (0.000722)	-0.000869 -0.000782	-0.000838 (0.000718)	-0.000909 -0.000775	-0.000843 (0.000719)	-0.000908 -0.000788
Monetary Policy Index	0.000785* ** (0.000238)	0.000804* ** (0.000238)	0.000670* ** -0.000256	0.000688* ** -0.000257	0.000696* ** (0.000249)	0.000714* ** -0.000249	0.000691* ** (0.000264)	0.000708* ** -0.000265	0.000692* ** (0.000264)	0.000709* ** -0.000265	0.000694* ** (0.000265)	0.000711* ** -0.000266	0.000757* ** (0.000255)	0.000775* ** -0.00026
PSPP	0.000607	0.000647	0.000524	0.000563	0.000600	0.000639	0.000584	0.000617	0.000583	0.000616	0.000581	0.000616	0.000589	0.000627

	(0.000406)	(0.000398)	-0.000393	-0.000375	(0.000409)	-0.000403	(0.000404)	-0.000395	(0.000405)	-0.000397	(0.000402)	-0.000392	(0.000410)	-0.000405
Short-run indirect effects														
UMP Announcements (-1)	0.000154		3.02E-04		0.000302		0.000399		0.000390		0.000403		0.000296	
	(0.000139)		-2.80E-04		(0.000280)		(0.000428)		(0.000423)		(0.000424)		(0.000298)	
UMP Announcements (+1)		2.45e-05		4.36E-05		4.49E-05		4.01E-05		3.64E-05		4.24E-05		2.93E-05
		(6.64e-05)		-1.37E-04		-1.45E-04		-2.10E-04		-2.08E-04		-2.04E-04		-1.50E-04
CMP Announcements	-0.000180	-0.000205	-3.77E-04	-4.23E-04	-0.000351	-3.96E-04	-0.000451	-5.05E-04	-0.000443	-4.95E-04	-0.000453	-5.06E-04	-0.000326	-3.65E-04
	(0.000141)	(0.000159)	-3.32E-04	-3.77E-04	(0.000312)	-3.58E-04	(0.000464)	-5.39E-04	(0.000459)	-5.32E-04	(0.000458)	-5.24E-04	(0.000312)	-3.63E-04
Monetary Policy Index	0.000128*	0.000135*	0.000212*	0.000223*	0.000235*	0.000247*	0.000331*	0.000345*	0.000328*	0.000342*	0.000322*	0.000336*	0.000261*	0.000274*
	**	**	*	*	**	**	*	*	*	*	*	*	**	**
	(4.16e-05)	(4.45e-05)	-8.60E-05	-9.15E-05	(8.53e-05)	-9.07E-05	(0.000141)	-1.50E-04	(0.000139)	-1.48E-04	(0.000138)	-1.46E-04	(9.40e-05)	-1.01E-04
PSPP	9.65e-05	0.000106	1.65E-04	1.84E-04	0.000197	2.15E-04	0.000286	3.09E-04	0.000284	3.07E-04	0.000275	2.98E-04	0.000208	2.26E-04
	(6.63e-05)	(6.69e-05)	-1.37E-04	-1.36E-04	(0.000136)	-1.36E-04	(0.000225)	-2.28E-04	(0.000224)	-2.27E-04	(0.000216)	-2.17E-04	(0.000160)	-1.61E-04
Short-run Total effects														
UMP Announcements (-1)	0.000987		1.11E-03		0.00108		0.00107		0.00105		0.00110		0.00102	
	(0.000822)		-9.22E-04		(0.000944)		(0.00105)		(0.00105)		(0.00105)		(0.000945)	
UMP Announcements (+1)		0.000169		1.61E-04		1.67E-04		1.19E-04		1.08E-04		1.26E-04		1.05E-04
		(0.000452)		-5.24E-04		-5.48E-04		-6.05E-04		-6.01E-04		-5.97E-04		-5.50E-04
CMP Announcements	-0.00119	-0.00132	-1.38E-03	-1.51E-03	-0.00127	-1.41E-03	-0.00127	-1.38E-03	-0.00125	-1.36E-03	-0.00129	-1.41E-03	-0.00117	-1.27E-03
	(0.000831)	(0.000908)	-1.03E-03	-1.13E-03	(0.00104)	-1.14E-03	(0.00116)	-1.29E-03	(0.00116)	-1.28E-03	(0.00115)	-1.27E-03	(0.00102)	-1.13E-03
Monetary Policy Index	0.000914*	0.000939*	0.000882*	0.000911*	0.000931*	0.000961*	0.00102**	0.00105**	0.00102**	0.00105**	0.00102**	0.00105**	0.00102**	0.00105**
	**	**	**	**	**	**	*	*	*	*	*	*	*	*
	(0.000270)	(0.000272)	-3.19E-04	-3.23E-04	(0.000322)	-3.26E-04	(0.000375)	-3.81E-04	(0.000374)	-3.79E-04	(0.000374)	-3.78E-04	(0.000328)	-3.36E-04
PSPP	0.000704	0.000753	6.88E-04	7.47E-04	0.000796	8.54E-04	0.000870	9.26E-04	0.000867	9.23E-04	0.000856	9.14E-04	0.000797	8.53E-04
	(0.000468)	(0.000460)	-5.18E-04	-4.96E-04	(0.000538)	-5.31E-04	(0.000611)	-6.01E-04	(0.000612)	-6.02E-04	(0.000600)	-5.87E-04	(0.000559)	-5.53E-04
Long-run direct effects														

UMP Announcements (-1)	0.000825		8.05E-04		0.000771		0.000661		0.000652		0.000692		0.000714	
	(0.000681)		-6.54E-04		(0.000665)		(0.000636)		(0.000636)		(0.000637)		(0.000653)	
UMP Announcements (+1)		0.000143		1.17E-04		1.21E-04		7.81E-05		7.12E-05		8.28E-05		7.47E-05
		(0.000383)		-3.89E-04		-4.02E-04		-3.98E-04		-3.96E-04		-3.95E-04		-4.00E-04
CMP Announcements	-0.000997	-0.00110	-1.00E-03	-1.08E-03	-0.000915	-9.99E-04	-0.000806	-8.70E-04	-0.000797	-8.60E-04	-0.000829	-8.99E-04	-0.000835	-8.99E-04
	(0.000689)	(0.000748)	-7.13E-04	-7.76E-04	(0.000725)	-7.90E-04	(0.000714)	-7.74E-04	(0.000715)	-7.74E-04	(0.000711)	-7.67E-04	(0.000713)	-7.81E-04
Monetary Policy Index	0.000777*	0.000795*	0.000666*	0.000683*	0.000689*	0.000706*	0.000684*	0.000701*	0.000686*	0.000702*	0.000687*	0.000704*	0.000750*	0.000768*
	**	**	**	**	**	**	**	**	**	**	**	**	**	**
	(0.000236)	(0.000235)	-2.54E-04	-2.54E-04	(0.000246)	-2.46E-04	(0.000261)	-2.63E-04	(0.000262)	-2.63E-04	(0.000263)	-2.63E-04	(0.000253)	-2.57E-04
PSPP	0.000601	0.000640	5.20E-04	5.59E-04	0.000594	6.32E-04	0.000578	6.11E-04	0.000577	6.10E-04	0.000575	6.10E-04	0.000584	6.21E-04
	(0.000402)	(0.000394)	-3.90E-04	-3.72E-04	(0.000404)	-3.99E-04	(0.000400)	-3.91E-04	(0.000401)	-3.93E-04	(0.000398)	-3.88E-04	(0.000406)	-4.01E-04
Long-run indirect effects														
UMP Announcements (-1)	0.000142		5.03E-04		0.000384		0.000378		0.000363		0.000388		0.000249	
	(0.000129)		-4.53E-04		(0.000353)		(0.000406)		(0.000394)		(0.000408)		(0.000253)	
UMP Announcements (+1)		2.23e-05		7.23E-05		5.65E-05		3.74E-05		3.32E-05		4.03E-05		2.42E-05
		(6.06e-05)		-2.28E-04		-1.82E-04		-1.97E-04		-1.90E-04		-1.94E-04		-1.24E-04
CMP Announcements	-0.000166	-0.000188	-6.28E-04	-6.95E-04	-0.000448	-4.94E-04	-0.000428	-4.72E-04	-0.000412	-4.54E-04	-0.000436	-4.80E-04	-0.000273	-3.02E-04
	(0.000131)	(0.000147)	-5.29E-04	-5.95E-04	(0.000392)	-4.40E-04	(0.000439)	-5.03E-04	(0.000428)	-4.88E-04	(0.000441)	-4.97E-04	(0.000264)	-3.04E-04
Monetary Policy Index	0.000118*	0.000123*	0.000365*	0.000380*	0.000303*	0.000312*	0.000313*	0.000322*	0.000305*	0.000313*	0.000310*	0.000319*	0.000217*	0.000223*
	**	**	**	**	**	**	*	*	*	*	*	*	**	**
	(3.88e-05)	(4.13e-05)	-1.38E-04	-1.44E-04	(0.000108)	-1.12E-04	(0.000134)	-1.40E-04	(0.000130)	-1.36E-04	(0.000133)	-1.39E-04	(8.06e-05)	-8.55E-05
PSPP	8.86e-05	9.64e-05	2.84E-04	3.12E-04	0.000255	2.73E-04	0.000271	2.89E-04	0.000263	2.80E-04	0.000265	2.83E-04	0.000173	1.85E-04
	(6.11e-05)	(6.12e-05)	-2.27E-04	-2.22E-04	(0.000175)	-1.71E-04	(0.000213)	-2.13E-04	(0.000209)	-2.08E-04	(0.000208)	-2.06E-04	(0.000135)	-1.34E-04
Long-run total effects														
UMP Announcements (-1)	0.000967		1.31E-03		0.00116		0.00104		0.00102		0.00108		0.000963	

	(0.000805)		-1.09E-03		(0.00101)		(0.00102)		(0.00101)		(0.00103)		(0.000894)	
UMP Announcements (+1)	0.000165		1.89E-04		1.78E-04		1.15E-04		1.04E-04		1.23E-04		9.89E-05	
	(0.000442)		-6.13E-04		-5.82E-04		-5.87E-04		-5.80E-04		-5.82E-04		-5.20E-04	
CMP Announcements	-0.00116	-0.00129	-1.63E-03	-1.78E-03	-0.00136	-1.49E-03	-0.00123	-1.34E-03	-0.00121	-1.31E-03	-0.00127	-1.38E-03	-0.00111	-1.20E-03
	(0.000814)	(0.000887)	-1.22E-03	-1.35E-03	(0.00111)	-1.22E-03	(0.00113)	-1.25E-03	(0.00112)	-1.23E-03	(0.00113)	-1.23E-03	(0.000963)	-1.07E-03
Monetary Policy Index	0.000895*	0.000918*	0.00103**	0.00106**	0.000993*	0.00102**	0.000998*	0.00102**	0.000990*	0.00101**	0.000998*	0.00102**	0.000966*	0.000992*
	**	**	*	*	**	*	**	*	**	*	**	*	**	**
	(0.000265)	(0.000266)	-3.71E-04	-3.75E-04	(0.000343)	-3.45E-04	(0.000366)	-3.70E-04	(0.000363)	-3.66E-04	(0.000367)	-3.69E-04	(0.000312)	-3.18E-04
PSPP	0.000689	0.000736	8.04E-04	8.71E-04	0.000849	9.05E-04	0.000849	8.99E-04	0.000841	8.90E-04	0.000840	8.93E-04	0.000757	8.06E-04
	(0.000459)	(0.000450)	-0.000606	-0.000581	(0.000573)	-0.000562	(0.000596)	-0.000583	(0.000593)	-0.00058	(0.000588)	-0.000573	(0.000530)	-0.000523
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LogL	7975.5051	7974.1344	7979.6967	7978.3916	7983.3498	7982.1621	7993.0905	7992.2077	7992.9052	7992.0457	7992.0873	7991.1134	7983.6563	7982.6154
No. of countries/observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.3038	0.3405	0.1051	0.1561	0.0016	0.0018	0.4515	0.4708	0.5688	0.5955	0.4946	0.516	0.2731	0.2895

Notes: Dependent variable: Credit to Consumers from MFI's in growth rates (log differences); UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). For reasons of parsimony, only the variables of interest (monetary policy related) are presented. Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.21: MFI credit to other organizations and Unconventional Monetary Policy effects

Interaction Matrix (W):	Dependent variable Other organizations													
	Trade		Portfolio		Credit		Socioeconomic		FDI		Debt to GDP		Deficit to GDP	
Independent Variables														
UMP Announcements (-1)	0.000179 (0.000307)		0.000182 (0.000309)		0.000236 (-0.000302)		0.000194 (0.000307)		0.000197 (0.000307)		0.000206 (0.000305)		0.000204 (0.000305)	
UMP Announcements (+1)		0.000134 (0.000379)		0.000109 (0.000387)		0.000112 (0.000398)		0.00007 (-0.000393)		6.34e-05 (0.000392)		0.000075 (-0.000391)		0.0000662 (-0.000397)
CMP Announcements	- 0.000596* (0.000296)	-0.00109 (0.000730)	-0.000523* (0.000290)	-0.00107 (0.000770)	-0.000505* (-0.000292)	-0.000983 (0.000767)	-0.000481* (0.000283)	-0.000857 (-0.000761)	-0.000487* (0.000283)	-0.000847 (0.000763)	-0.000488* (0.000277)	-0.000886 (-0.000761)	- 0.000527* (0.000287)	-0.000888 (-0.000766)
Monetary Policy Index	0.000198 (0.000134)	0.000800** (0.000247)	0.000176 (0.000132)	0.000685** (0.000256)	0.000168 (-0.000136)	0.000711** (0.000253)	0.000203 (0.000136)	0.000703** (-0.000265)	0.000203 (0.000136)	0.000705** (0.000265)	0.000205 (0.000136)	0.000707** (-0.000265)	0.000219 (0.000135)	0.000773** (-0.000262)
PSPP	-0.000400* (0.000225)	0.000658* (0.000394)	- 0.000458* (0.000233)	0.000565 (0.000386)	-0.000386* (-0.000214)	0.000643 (0.000401)	-0.000381* (0.000214)	0.000617 (-0.000398)	-0.000379* (0.000214)	0.000617 (0.000399)	-0.000391* (0.000215)	0.000614 (-0.000397)	0.000366 (0.000215)	0.000633 (-0.000399)
Short-run direct effects														
UMP Announcements (-1)	0.000196 (0.000319)		0.000198 (0.000317)		0.000253 (-0.000315)		0.000209 (0.000320)		0.000212 (0.000321)		0.000221 (0.000318)		0.000220 (0.000317)	
UMP Announcements (+1)		0.000145 (0.000387)		0.000118 (0.000392)		0.000123 (0.000406)		0.0000789 (-0.000402)		7.19e-05 (0.000400)		0.0000837 (-0.000399)		0.0000754 (-0.000404)
CMP Announcements	- 0.000616* (0.000308)	-0.00111 (0.000756)	-0.000541* (0.000291)	-0.00109 (0.000779)	-0.000525* (-0.000301)	-0.00101 (0.000797)	-0.000499* (0.000292)	-0.00088 (-0.000782)	-0.000505* (0.000292)	-0.000869 (0.000782)	-0.000506* (0.000287)	-0.000909 (-0.000775)	- 0.000547* (0.000293)	-0.000908 (-0.000788)
Monetary Policy Index	0.000203	0.000804** (0.000247)	0.000181	0.000688** (0.000256)	0.000173	0.000714** (0.000253)	0.000208	0.000708** (-0.000265)	0.000208	0.000709** (0.000265)	0.000211	0.000711** (-0.000265)	0.000224 (0.000135)	0.000775** (-0.000262)

	(0.000142)	(0.000238)	(0.000129)	(0.000257)	-0.000138	(0.000249)	(0.000133)	-0.000265	(0.000132)	(0.000265)	(0.000133)	-0.000266	(0.000135)	-0.00026
PSPP	-0.000419*	0.000647	0.000476* *	0.000563	-0.000406*	0.000639	-0.000399*	0.000617	-0.000397*	0.000616	-0.000409*	0.000616	0.000384 *	0.000627
	(0.000228)	(0.000398)	(0.000229)	(0.000375)	-0.000214	(0.000403)	(0.000213)	-0.000395	(0.000213)	(0.000397)	(0.000213)	-0.000392	(0.000216)	-0.000405
Short-run indirect effects														
UMP Announcements (-1)	4.20e-05		5.77e-05		9.54E-05		7.67e-05		7.50e-05		7.85e-05		7.82e-05	
	(7.52e-05)		(9.72e-05)		-1.22E-04		(0.000129)		(0.000125)		(0.000122)		(0.000116)	
UMP Announcements (+1)		2.45e-05		4.36e-05		4.49e-05		4.01E-05		3.64e-05		4.24E-05		2.93E-05
		(6.64e-05)		(0.000137)		(0.000145)		-2.10E-04		(0.000208)		-2.04E-04		-1.50E-04
CMP Announcements	-0.000143*	-0.000205	-0.000176	-0.000423	-2.08E-04	-0.000396	-0.000205	-5.05E-04	-0.000200	-0.000495	-0.000197	-5.06E-04	-	-3.65E-04
	(7.82e-05)	(0.000159)	(0.000118)	(0.000377)	-1.32E-04	(0.000358)	(0.000133)	-5.39E-04	(0.000129)	(0.000532)	(0.000125)	-5.24E-04	(0.000124)	-3.63E-04
Monetary Policy Index	4.48e-05	0.000135** *	5.14e-05	0.000223**	6.07E-05	0.000247** *	7.78e-05	0.000345**	7.52e-05	0.000342**	7.38e-05*	0.000336**	7.67e-05*	0.000274** *
	(3.04e-05)	(4.45e-05)	(3.64e-05)	(9.15e-05)	-4.68E-05	(9.07e-05)	(4.77e-05)	-1.50E-04	(4.62e-05)	(0.000148)	(4.44e-05)	-1.46E-04	(4.26e-05)	-1.01E-04
PSPP	-9.35e-05*	0.000106	-	0.000142* *	0.000184	0.000147* *	0.000215	0.000152* *	3.09E-04	0.000146* *	0.000307	0.000147* *	2.98E-04	0.000133 *
	(4.88e-05)	(6.69e-05)	(7.07e-05)	(0.000136)	-7.02E-05	(0.000136)	(7.70e-05)	-2.28E-04	(7.45e-05)	(0.000227)	(7.17e-05)	-2.17E-04	(7.18e-05)	-1.61E-04
Short-run Total effects														
UMP Announcements (-1)	0.000238		0.000256		3.48E-04		0.000286		0.000286		0.000300		0.000298	
	(0.000392)		(0.000412)		-4.34E-04		(0.000446)		(0.000442)		(0.000437)		(0.000431)	
UMP Announcements (+1)		0.000169		0.000161		0.000167		1.19E-04		0.000108		1.26E-04		1.05E-04
		(0.000452)		(0.000524)		(0.000548)		-6.05E-04		(0.000601)		-5.97E-04		-5.50E-04
CMP Announcements	-	0.000759* *	-0.00132	-0.000717*	-0.00151	-0.000733*	-0.00141	-0.000703*	-1.38E-03	-0.000705*	-0.00136	-0.000703*	-1.41E-03	-
	(0.000380)	(0.000908)	(0.000404)	(0.00113)	-4.28E-04	(0.00114)	(0.000417)	-1.29E-03	(0.000413)	(0.00128)	(0.000405)	-1.27E-03	(0.000411)	-1.13E-03
Monetary Policy Index	0.000248	0.000939** *	0.000233	0.000911** *	2.34E-04	0.000961** *	0.000286	0.00105***	0.000284	0.00105***	0.000285	0.00105***	0.000300 *	0.00105***

	(0.000171)	(0.000272)	(0.000164)	(0.000323)	-1.83E-04	(0.000326)	(0.000177)	-3.81E-04	(0.000175)	(0.000379)	(0.000174)	-3.78E-04	(0.000174)	-3.36E-04
PSPP	-0.000512*	0.000753	0.000619*	0.000747	0.000553*	0.000854	-0.000551*	9.26E-04	-0.000543*	0.000923	0.000557*	9.14E-04	0.000517	8.53E-04
	(0.000272)	(0.000460)	(0.000294)	(0.000496)	-2.80E-04	(0.000531)	(0.000283)	-6.01E-04	(0.000280)	(0.000602)	(0.000277)	-5.87E-04	(0.000283)	-5.53E-04

Long-run direct effects

UMP Announcements (-1)	0.000203		0.000206		2.63E-04		0.000217		0.000219		0.000229		0.000228	
	(0.000332)		(0.000330)		-3.27E-04		(0.000332)		(0.000332)		(0.000330)		(0.000329)	
UMP Announcements (+1)		0.000143		0.000117		0.000121		7.81E-05		7.12e-05		8.28E-05		7.47E-05
		(0.000383)		(0.000389)		(0.000402)		-3.98E-04		(0.000396)		-3.95E-04		-4.00E-04
CMP Announcements	0.000641*	-0.00110	-0.000563*	-0.00108	-0.000546*	-0.000999	-0.000517*	-8.70E-04	-0.000524*	-0.000860	-0.000524*	-8.99E-04	0.000567	-8.99E-04
	(0.000321)	(0.000748)	(0.000304)	(0.000776)	-3.13E-04	(0.000790)	(0.000303)	-7.74E-04	(0.000303)	(0.000774)	(0.000298)	-7.67E-04	(0.000304)	-7.81E-04
Monetary Policy Index	0.000212	0.000795**	0.000189	0.000683**	1.80E-04	0.000706**	0.000216	0.000701**	0.000216	0.000702**	0.000218	0.000704**	0.000232	0.000768**
	(0.000148)	(0.000235)	(0.000134)	(0.000254)	-1.43E-04	(0.000246)	(0.000138)	-2.63E-04	(0.000137)	(0.000263)	(0.000138)	-2.63E-04	(0.000139)	-2.57E-04
PSPP	-0.000436*	0.000640	0.000496*	0.000559	-0.000421*	0.000632	-0.000414*	6.11E-04	-0.000411*	0.000610	-0.000424*	6.10E-04	0.000398	6.21E-04
	(0.000237)	(0.000394)	(0.000239)	(0.000372)	-2.22E-04	(0.000399)	(0.000220)	-3.91E-04	(0.000220)	(0.000393)	(0.000221)	-3.88E-04	(0.000224)	-4.01E-04

Long-run indirect effects

UMP Announcements (-1)	7.70e-05		9.58e-05		1.54E-04		0.000121		0.000119		0.000127		0.000127	
	(0.000134)		(0.000159)		-1.95E-04		(0.000201)		(0.000196)		(0.000196)		(0.000187)	
UMP Announcements (+1)		2.23e-05		7.23e-05		5.65e-05		3.74E-05		3.32e-05		4.03E-05		2.42E-05
		(6.06e-05)		(0.000228)		(0.000182)		-1.97E-04		(0.000190)		-1.94E-04		-1.24E-04
CMP Announcements	-0.000258*	-0.000188	-0.000287	-0.000695	-3.33E-04	-0.000494	-0.000320	-4.72E-04	-0.000314	-0.000454	-0.000316	-4.80E-04	0.000331	-3.02E-04
	(0.000136)	(0.000147)	(0.000186)	(0.000595)	-2.07E-04	(0.000440)	(0.000204)	-5.03E-04	(0.000198)	(0.000488)	(0.000196)	-4.97E-04	(0.000196)	-3.04E-04

Monetary Policy Index	8.17e-05	0.000123** *	8.58e-05	0.000380** *	9.86E-05	0.000312** *	0.000123	0.000322**	0.000119	0.000313**	0.000120*	0.000319**	0.000125 *	0.000223** *
	(5.51e-05)	(4.13e-05)	(6.02e-05)	(0.000144)	-7.61E-05	(0.000112)	(7.49e-05)	-1.40E-04	(7.27e-05)	(0.000136)	(7.18e-05)	-1.39E-04	(6.95e-05)	-8.55E-05
PSPP	-0.000170*	9.64e-05	0.000236* *	0.000312	0.000238* *	0.000273	0.000240* *	2.89E-04	0.000231* *	0.000280	0.000239* *	2.83E-04	0.000217 *	1.85E-04
	(8.78e-05)	(6.12e-05)	(0.000115)	(0.000222)	-1.14E-04	(0.000171)	(0.000120)	-2.13E-04	(0.000117)	(0.000208)	(0.000115)	-2.06E-04	(0.000116)	-1.34E-04
Long-run total effects														
UMP Announcements (-1)	0.000280		0.000302		4.16E-04		0.000338		0.000338		0.000357		0.000355	
	(0.000465)		(0.000487)		-5.19E-04		(0.000530)		(0.000524)		(0.000522)		(0.000513)	
UMP Announcements (+1)		0.000165		0.000189		0.000178		1.15E-04		0.000104		1.23E-04		9.89E-05
		(0.000442)		(0.000613)		(0.000582)		-5.87E-04		(0.000580)		-5.82E-04		-5.20E-04
CMP Announcements	-	0.000899* *	-0.00129	-0.000851*	-0.00178	-0.000879*	-0.00149	-0.000837*	-1.34E-03	-0.000837*	-0.00131	-0.000841*	-1.38E-03	0.000898 *
	(0.000451)	(0.000887)	(0.000484)	(0.00135)	-5.16E-04	(0.00122)	(0.000499)	-1.25E-03	(0.000492)	(0.00123)	(0.000486)	-1.23E-03	(0.000493)	-1.07E-03
Monetary Policy Index	0.000293	0.000918** *	0.000274	0.00106***	2.79E-04	0.00102***	0.000339	0.00102***	0.000335	0.00101***	0.000338	0.00102***	0.000357 *	0.000992** *
	(0.000201)	(0.000266)	(0.000193)	(0.000375)	-2.18E-04	(0.000345)	(0.000209)	-3.70E-04	(0.000206)	(0.000366)	(0.000206)	-3.69E-04	(0.000206)	-3.18E-04
PSPP	-0.000605*	0.000736	0.000731* *	0.000871	0.000660* *	0.000905	0.000654* *	8.99E-04	-0.000642*	0.000890	0.000663* *	8.93E-04	0.000615 *	8.06E-04
	(0.000321)	(0.000450)	(0.000347)	(0.000581)	-3.32E-04	(0.000562)	(0.000333)	-5.83E-04	(0.000329)	(0.000580)	(0.000328)	-5.73E-04	(0.000335)	-5.23E-04
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LogL	9494.0199	7974.1344	9489.9875	7978.3916	9499.8534	7982.1621	9497.0945	7992.2077	9496.0613	7992.0457	9495.9624	7991.1134	9496.038 1	7982.6154
No. of countries/observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.0983	0.3405	0.0005	0.1561	0.0311	0.0018	0.0024	0.4708	0.002	0.5955	0.0034	0.516	0.008	0.2895

Notes: Dependent variable: Credit to Other organizations from MFI's in growth rates (log differences); UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). For reasons of parsimony, only the variables of interest (monetary policy related) are presented. Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}_N'\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Table 2.22: MFI Credit to Financial Intermediaries and Unconventional Monetary Policy effects

Dependent variable MFI Financial Intermediaries														
Interaction Matrix (W):	Trade		Portfolio		Credit		Socioeconomic		FDI		Debt to GDP		Deficit to GDP	
Independent Variables														
UMP Announcements (-1)	-0.00181		-0.0019		-0.00148		-0.00153		-0.00156		-0.00162		-0.00154	
	(0.00148)		-0.00145		-0.00143		-0.00142		-0.00143		-0.00143		-0.00144	
UMP Announcements (+1)	0.00236		0.00235		0.00238		0.00233		0.00234		0.00241		0.00233	
	-0.00151		-0.00152		-0.00155		-0.00151		-0.00151		-0.00153		(0.00160)	
CMP Announcements	-0.00234	-0.0026	-0.00239	-0.00271	-0.00248	-0.00278	-0.00236	-0.00265	-0.00233	-0.00262	-0.00246	-0.00276	-0.0024	-0.00269
	(0.00223)	-0.0022	-0.00229	-0.00227	-0.00228	-0.00224	-0.00228	-0.00222	-0.00227	-0.00221	-0.00226	-0.00221	-0.0022	(0.00215)
Monetary Policy Index	-0.000272	-0.000408	-0.000306	-0.000431	-0.000263	-0.000392	-0.000253	-0.000382	-0.000249	-0.00038	-0.000253	-0.000389	-0.000248	-0.000378
	(0.000947)	-0.000969	-0.000944	-0.000968	-0.000952	-0.000974	-0.000962	-0.000984	-0.000964	-0.000986	-0.000961	-0.000983	-0.000967	(0.000989)
PSPP	-0.00184*	-0.00191*	-0.00185*	-0.00190*	-0.00176*	-0.00181*	-0.00179*	-0.00184*	-0.00179*	-0.00185*	-0.00178*	-0.00183*	-0.00176*	-0.00181*
	(0.00103)	-0.00105	-0.00108	-0.0011	-0.00106	-0.00107	-0.00104	-0.00105	-0.00104	-0.00105	-0.00104	-0.00105	-0.00102	(0.00103)
Short-run direct effects														
UMP Announcements (-1)	-0.00174		-0.00183		-0.00142		-0.00147		-0.0015		-0.00156		-0.00148	
	(0.00146)		-0.00143		-0.00141		-0.0014		-0.0014		-0.0014		-0.00142	
UMP Announcements (+1)	0.00237		0.00235		0.00238		0.00233		0.00234		0.00241		0.00233	
	-0.00145		-0.00147		-0.00149		-0.00145		-0.00145		-0.00147		(0.00153)	
CMP Announcements	-0.00237	-0.00262	-0.00242	-0.00272	-0.00252	-0.0028	-0.0024	-0.00267	-0.00237	-0.00265	-0.0025	-0.00278	-0.00244	-0.00270
	(0.00222)	-0.0022	-0.00225	-0.00224	-0.00222	-0.00221	-0.00221	-0.00218	-0.00221	-0.00217	-0.00221	-0.00219	-0.00219	(0.00216)
Monetary Policy Index	-0.000221	-0.000366	-0.000252	-0.000382	-0.000214	-0.00035	-0.00021	-0.000347	-0.000207	-0.000346	-0.000212	-0.000353	-0.000212	-0.000347
	(0.000909)	-0.000925	-0.000921	-0.000946	-0.000903	-0.000919	-0.000906	-0.000925	-0.000907	-0.000926	-0.000903	-0.000921	-0.000905	(0.000924)
PSPP	-0.00186*	-0.00193*	-0.00188*	-0.00192*	-0.00179*	-0.00184*	-0.00182*	-0.00187*	-0.00183*	-0.00188*	-0.00181*	-0.00186*	-0.00180*	-0.00185*
	(0.00105)	-0.00107	-0.00109	-0.0011	-0.00107	-0.00109	-0.00106	-0.00108	-0.00106	-0.00108	-0.00106	-0.00108	-0.00107	(0.00108)

Short-run indirect effects														
UMP Announcements (-1)	-0.000146		-1.39E-04		-7.13E-05		-9.95E-05		-9.60E-05		-5.00E-05		-7.63E-05	
	(0.000143)		-1.70E-04		-9.78E-05		-1.13E-04		-1.09E-04		-9.62E-05		-1.36E-04	
UMP Announcements (+1)		1.93E-04		1.67E-04		1.17E-04		1.73E-04		1.66E-04		8.33E-05		0.000110
		-1.55E-04		-1.87E-04		-1.12E-04		-1.41E-04		-1.37E-04		-1.29E-04		(0.000157)
CMP Announcements	-0.000194	-2.12E-04	-1.21E-04	-1.19E-04	-1.37E-04	-1.44E-04	-1.88E-04	-2.00E-04	-1.76E-04	-1.88E-04	-1.01E-04	-1.01E-04	-1.86E-04	-0.000188
	(0.000214)	-2.13E-04	-2.05E-04	-1.87E-04	-1.65E-04	-1.65E-04	-2.06E-04	-1.97E-04	-1.97E-04	-1.89E-04	-1.67E-04	-1.66E-04	-2.59E-04	(0.000254)
Monetary Policy Index	-2.21e-05	-3.39E-05	-2.27E-05	-2.55E-05	-1.29E-05	-2.10E-05	-6.72E-06	-1.84E-05	-4.37E-06	-1.59E-05	-1.99E-06	-8.94E-06	-2.37E-06	-1.17e-05
	(8.29e-05)	-8.27E-05	-8.09E-05	-7.34E-05	-6.25E-05	-6.38E-05	-7.78E-05	-7.49E-05	-7.44E-05	-7.16E-05	-5.44E-05	-5.38E-05	-8.55E-05	(8.46e-05)
PSPP	-0.000151	-1.53E-04	-1.55E-04	-1.32E-04	-1.08E-04	-1.07E-04	-1.41E-04	-1.37E-04	-1.35E-04	-1.31E-04	-7.83E-05	-7.34E-05	-1.14E-04	-0.000110
	(0.000107)	-1.10E-04	-1.66E-04	-1.49E-04	-9.84E-05	-1.02E-04	-1.05E-04	-1.03E-04	-1.02E-04	-9.95E-05	-1.00E-04	-1.01E-04	-1.30E-04	(0.000132)
Short-run Total effects														
UMP Announcements (-1)	-0.00189		-1.97E-03		-1.49E-03		-1.57E-03		-1.60E-03		-1.61E-03		-1.55E-03	
	(0.00158)		-1.55E-03		-1.48E-03		-1.49E-03		-1.49E-03		-1.44E-03		-1.49E-03	
UMP Announcements (+1)		2.56E-03		2.52E-03		2.49E-03		2.50E-03		2.50E-03		0.00250*		0.00244
		-1.57E-03		-1.61E-03		-1.55E-03		-1.55E-03		-1.55E-03		-1.51E-03		(0.00157)
CMP Announcements	-0.00256	-2.83E-03	-2.55E-03	-2.84E-03	-2.66E-03	-2.94E-03	-2.59E-03	-2.87E-03	-2.55E-03	-2.83E-03	-2.60E-03	-2.88E-03	-2.63E-03	-0.00289
	(0.00241)	-2.39E-03	-2.37E-03	-2.33E-03	-2.34E-03	-2.32E-03	-2.39E-03	-2.35E-03	-2.37E-03	-2.33E-03	-2.30E-03	-2.26E-03	-2.36E-03	(0.00231)
Monetary Policy Index	-0.000244	-3.99E-04	-2.74E-04	-4.07E-04	-2.27E-04	-3.71E-04	-2.17E-04	-3.66E-04	-2.12E-04	-3.62E-04	-2.14E-04	-3.62E-04	-2.14E-04	-0.000358
	(0.000986)	-1.00E-03	-9.84E-04	-1.00E-03	-9.57E-04	-9.73E-04	-9.77E-04	-9.92E-04	-9.74E-04	-9.90E-04	-9.42E-04	-9.57E-04	-9.72E-04	(0.000987)
PSPP	-0.00201*	-0.00208*	-0.00203*	-0.00205*	-0.00190*	-0.00194*	-0.00196*	-0.00201*	-0.00196*	-0.00201*	-0.00189*	-0.00193*	-0.00191*	-0.00196*
	(0.00113)	-1.15E-03	-1.21E-03	-1.21E-03	-1.14E-03	-1.15E-03	-1.14E-03	-1.15E-03	-1.14E-03	-1.15E-03	-1.11E-03	-1.12E-03	-1.11E-03	(0.00113)
Long-run direct effects														
UMP Announcements (-1)	-0.00162		-1.70E-03		-1.32E-03		-1.37E-03		-1.40E-03		-1.45E-03		-1.38E-03	

	(0.00135)	-1.33E-03	-1.31E-03	-1.30E-03	-1.31E-03	-1.30E-03	-1.31E-03	-1.31E-03	-1.31E-03	-1.32E-03				
UMP Announcements (+1)		2.20E-03	2.19E-03	2.21E-03	2.17E-03	2.18E-03	2.25E-03	0.00217						
		-1.35E-03	-1.37E-03	-1.39E-03	-1.35E-03	-1.35E-03	-1.37E-03							(0.00142)
CMP Announcements	-0.00220	-2.44E-03	-2.26E-03	-2.53E-03	-2.35E-03	-2.61E-03	-2.24E-03	-2.49E-03	-2.21E-03	-2.46E-03	-2.33E-03	-2.58E-03	-2.27E-03	-0.00252
	(0.00207)	-2.05E-03	-2.10E-03	-2.09E-03	-2.07E-03	-2.06E-03	-2.06E-03	-2.03E-03	-2.06E-03	-2.02E-03	-2.06E-03	-2.03E-03	-2.04E-03	(0.00201)
Monetary Policy Index	-0.000206	-3.40E-04	-2.35E-04	-3.55E-04	-2.00E-04	-3.26E-04	-1.96E-04	-3.23E-04	-1.93E-04	-3.22E-04	-1.97E-04	-3.29E-04	-1.97E-04	-0.000323
	(0.000846)	-8.60E-04	-8.57E-04	-8.80E-04	-8.41E-04	-8.56E-04	-8.43E-04	-8.61E-04	-8.45E-04	-8.62E-04	-8.41E-04	-8.57E-04	-8.43E-04	(0.000860)
PSPP	-0.00173*	-0.00179*	-0.00175*	-0.00179*	-0.00167*	-0.00171*	-0.00170*	-0.00174*	-0.00170*	-0.00175*	-0.00168*	-0.00173*	-0.00167*	-0.00172*
	(0.000975)	-9.92E-04	-1.01E-03	-1.03E-03	-9.96E-04	-1.01E-03	-9.89E-04	-1.00E-03	-9.91E-04	-1.00E-03	-9.91E-04	-1.00E-03	-9.94E-04	(0.00101)
Long-run indirect effects														
UMP Announcements (-1)	-0.000216		-1.29E-04		1.54E-07		-6.53E-05		-8.23E-05		-3.79E-05		-5.60E-05	
	(0.000194)		-1.52E-04		-5.46E-05		-8.18E-05		-9.31E-05		-8.09E-05		-1.12E-04	
UMP Announcements (+1)		2.72E-04		1.34E-04		-1.21E-05		1.02E-04		1.26E-04		4.96E-05		6.80e-05
		-1.92E-04		-1.56E-04		-7.96E-05		-9.98E-05		-1.10E-04		-1.06E-04		(0.000130)
CMP Announcements	-0.000289	-3.00E-04	-1.16E-04	-9.16E-05	-7.77E-06	8.75E-06	-1.28E-04	-1.18E-04	-1.51E-04	-1.43E-04	-7.82E-05	-6.17E-05	-1.43E-04	-0.000130
	(0.000294)	-2.75E-04	-1.83E-04	-1.56E-04	-9.32E-05	-1.03E-04	-1.51E-04	-1.34E-04	-1.69E-04	-1.50E-04	-1.40E-04	-1.34E-04	-2.11E-04	(0.000202)
Monetary Policy Index	-3.08e-05	-4.58E-05	-2.08E-05	-2.04E-05	-1.67E-06	-1.18E-06	-3.08E-06	-9.04E-06	-3.74E-06	-1.14E-05	-1.04E-06	-4.52E-06	-7.71E-07	-6.23e-06
	(0.000117)	-1.11E-04	-7.34E-05	-6.02E-05	-2.62E-05	-2.74E-05	-5.53E-05	-4.77E-05	-6.38E-05	-5.58E-05	-4.46E-05	-4.09E-05	-6.85E-05	(6.44e-05)
PSPP	-0.000226	-2.17E-04	-1.43E-04	-1.05E-04	-1.43E-05	-3.63E-06	-9.55E-05	-7.96E-05	-1.15E-04	-9.96E-05	-6.14E-05	-4.60E-05	-8.63E-05	-7.31e-05
	(0.000141)	-1.37E-04	-1.47E-04	-1.24E-04	-5.89E-05	-6.18E-05	-7.86E-05	-7.24E-05	-8.73E-05	-8.00E-05	-8.43E-05	-8.23E-05	-1.09E-04	(0.000108)
Long-run total effects														
UMP Announcements (-1)	-0.00184		-1.83E-03		-1.32E-03		-1.44E-03		-1.48E-03		-1.49E-03		-1.43E-03	
	(0.00154)		-1.44E-03		-1.31E-03		-1.36E-03		-1.38E-03		-1.33E-03		-1.37E-03	
UMP Announcements (+1)		2.47E-03		2.33E-03		2.20E-03		2.27E-03		2.30E-03		0.00229*		0.00223

		-1.52E-03		-1.48E-03		-1.37E-03		-1.41E-03		-1.42E-03		-1.39E-03		(0.00144)
CMP Announcements	-0.00249	-2.74E-03	-2.37E-03	-2.62E-03	-2.36E-03	-2.60E-03	-2.37E-03	-2.61E-03	-2.36E-03	-2.61E-03	-2.41E-03	-2.65E-03	-2.41E-03	-0.00265
	(0.00235)	-2.31E-03	-2.21E-03	-2.15E-03	-2.07E-03	-2.05E-03	-2.18E-03	-2.13E-03	-2.20E-03	-2.14E-03	-2.13E-03	-2.08E-03	-2.17E-03	(0.00211)
Monetary Policy Index	-0.000237	-3.86E-04	-2.55E-04	-3.76E-04	-2.01E-04	-3.27E-04	-1.99E-04	-3.32E-04	-1.97E-04	-3.34E-04	-1.98E-04	-3.33E-04	-1.98E-04	-0.000329
	(0.000960)	-9.67E-04	-9.17E-04	-9.23E-04	-8.48E-04	-8.58E-04	-8.92E-04	-9.00E-04	-9.02E-04	-9.11E-04	-8.71E-04	-8.80E-04	-8.94E-04	(0.000904)
PSPP	-0.00196*	-0.00201*	-0.00189*	-0.00189*	-0.00168*	-0.00172*	-0.00179*	-0.00182*	-0.00182*	-0.00185*	-0.00174*	-0.00178*	-0.00176*	-0.00179*
	(0.00110)	-1.11E-03	-1.12E-03	-1.11E-03	-1.01E-03	-1.02E-03	-1.04E-03	-1.04E-03	-1.05E-03	-1.06E-03	-1.03E-03	-1.03E-03	-1.03E-03	(0.00103)
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
LogL	4907.4174	4907.8884	4905.3926	4905.7692	4905.4562	4906.1409	4905.2971	4905.9038	4905.1775	4905.7784	4904.6391	4905.2748	4905.2474	4905.8506
No. of countries/observations	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502	18/2502
SDM vs SAR p-value	0.0136	0.0147	0.0004	0.0002	0.0429	0.0429	0.0051	0.0042	0.0051	0.0043	0.0033	0.0027	0.0352	0.0339

Notes: Dependent variable: Credit to Financial Intermediaries from MFI's in growth rates (log differences); UMP Announcements (-1): Unconventional Monetary Policy Announcements 1 month prior to the actual announcement; UMP Announcements (+1): Unconventional Monetary Policy Announcements 1 month after the actual announcement; CMP Announcements: Conventional Monetary Policy Announcements; PSPP: Unconventional Monetary Policy purchases; Monetary Policy Index: An index that tracks monetary policy search activity; Log-L = Log-pseudolikelihood. All spatial regressions were estimated with the `-xsmle-` Stata command (Belotti et al., 2017). For reasons of parsimony, only the variables of interest (monetary policy related) are presented. Model selection was based on the Wald, which tests the SDM (Spatial Durbin Model) against the SAR (Spatial Autoregressive Model): if the test reports a p-value greater than 0.05, then the null hypothesis of the SAR cannot be rejected at the 5% significance level. Direct short-run spillover effects of MFI Total equals $tr(\mathbf{S}_1)/N$ with $\mathbf{S}_1 = [\mathbf{I} - \rho\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$, \mathbf{I} is the $N \times N$ identity matrix where N is the number of countries; short-run total effect equals $N^{-1}\mathbf{z}'_N\mathbf{S}_1\mathbf{z}_N$, with the elements of the $N \times 1$ vector \mathbf{z}_N equal to one; as for short-run indirect effects they equal to the difference of the total and the direct effect. Long-run direct, total and indirect effects are in a similar manner in LeSage and Pace, (2009), with the exception of the substitution of matrix \mathbf{S}_1 , with $\mathbf{S}_2 = [(1 - \tau)\mathbf{I} - (\rho + \psi)\mathbf{W}]^{-1}[\beta_1\mathbf{I}]$. The corresponding effects for the rest of the variables are defined in a similar way. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively. Cases where the test indicates superiority of the SDM model are the exception, and results of the SDM do not qualitatively change our findings (results available upon request). As for the robust standard errors, they are reported in parentheses.

Thesis Conclusion

The research undertaken in this thesis offers considerable scope for future developments and policy consideration. Chapter 1 contributed to the growing literature on unconventional monetary policy in times of crisis, and provided evidence of divergence among European Union countries. The research in this area has shown that there is a noteworthy degree of heterogeneity regarding the way that unconventional monetary policies affect different countries. In our opinion, disentangling the reasons behind what drives this divergence is an important issue that should be considered by policymakers. When one wants to study possible convergence among countries, a number of different variables are viable candidates. One of the most prominent variables in the literature is government bond yields, as they are considered to be a main variable of convergence and a main component of stability, according to the Maastricht treaty. Papers in the literature do not consider unconventional monetary policies as a potential source of divergence, and in this chapter, we highlight the need to reconsider the scope of such policies. Disentangling this puzzle would help us maintain the common goal of European integration and improve policy.

Chapter 2 of this thesis contributed to the growing field of empirical finance that investigates the effects of unconventional monetary policies. To this end, we estimated a spatial econometrics model that accounts for possible spillover effects in a monetary union, and more specifically, spillover effects in the bank credit channel. Chapter 2 could be extended to include different macroeconomic variables of interest, but this surpasses the scope of the current thesis. To this end, we focused on a specific channel (bank credit), and by utilizing different mechanisms of interconnectedness, we concluded that unconventional monetary policies positively impact bank credit, either directly or indirectly. This contribution to the field raises important questions that need further investigation due to recent developments in the field (e.g., did COVID-19 affect

bank credit lines, and if yes, then how?), but such research hypotheses should be answered in future research papers in order to be properly addressed.