How Does Monetary Policy Affect Income and Wealth Inequality? Evidence from Quantitative Easing in the Euro Area

Online Appendix

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Abstract

This paper evaluates the impact of quantitative easing on income and wealth of individual euro area households. We first estimate the aggregate effects in a VAR model with unemployment, wages, interest rates, house prices and stock prices. We then distribute the aggregate effects across households using a reduced-form simulation on micro data, which captures the portfolio composition, the income composition and the earnings heterogeneity channels of transmission. The earnings heterogeneity channel is important: QE compresses the income distribution since many households with lower incomes become employed. In contrast, monetary policy has only negligible effects on the Gini coefficient for wealth.

Keywords Monetary Policy, Household Heterogeneity, Inequality, Income, Wealth, Quantitative Easing, Great Recession

JEL codes D14, D31, E44, E52, E58

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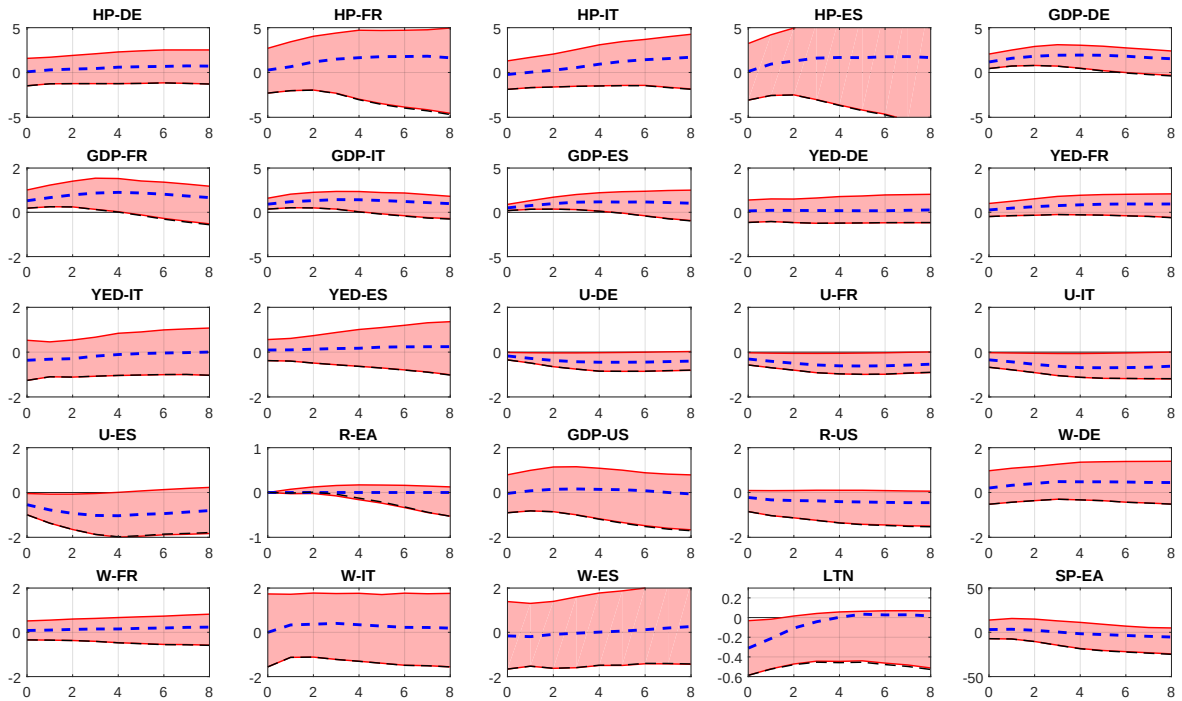
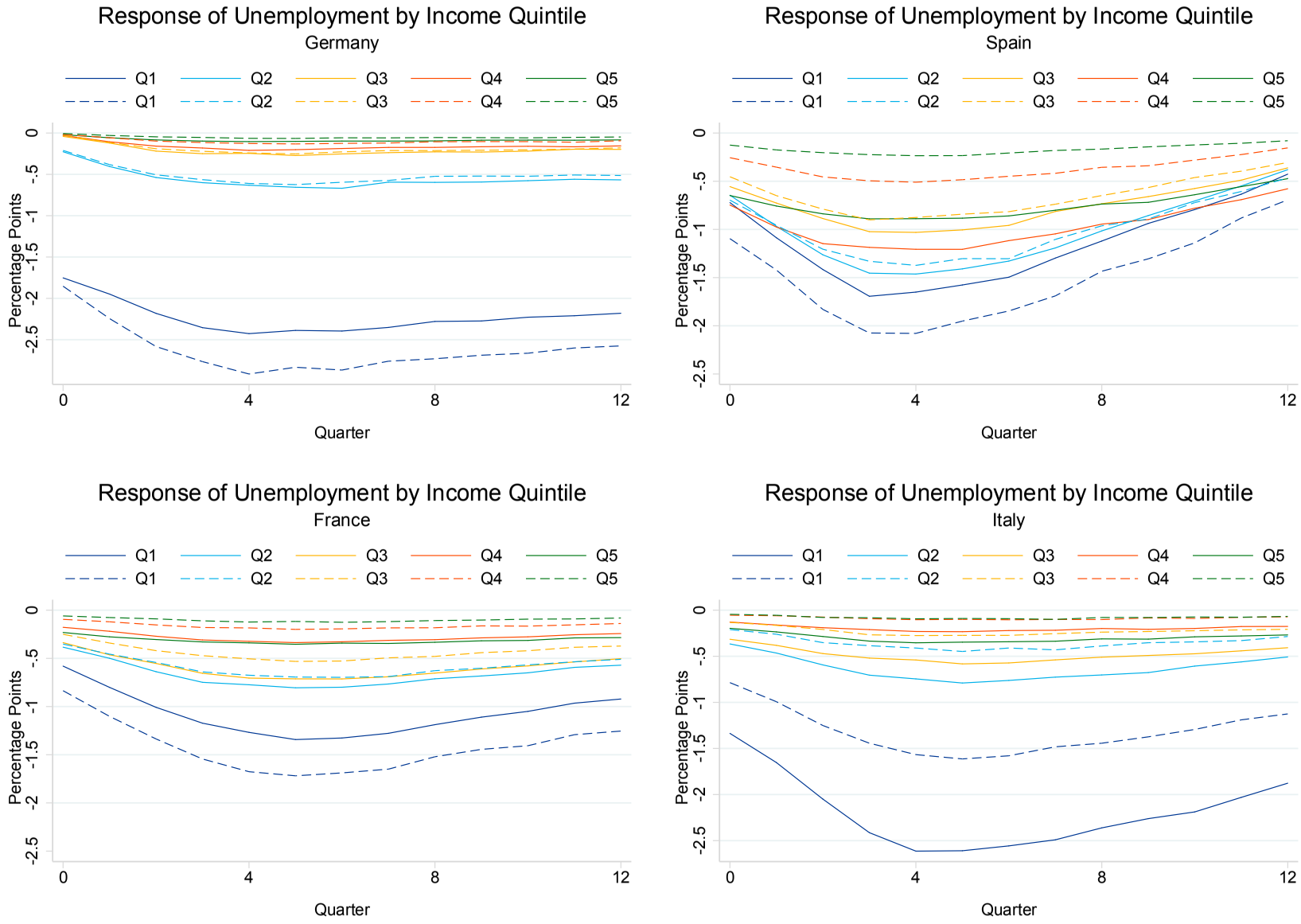
Online Appendix C: Additional Figures and Tables

Figure C.1 Impulse Responses to QE Shock



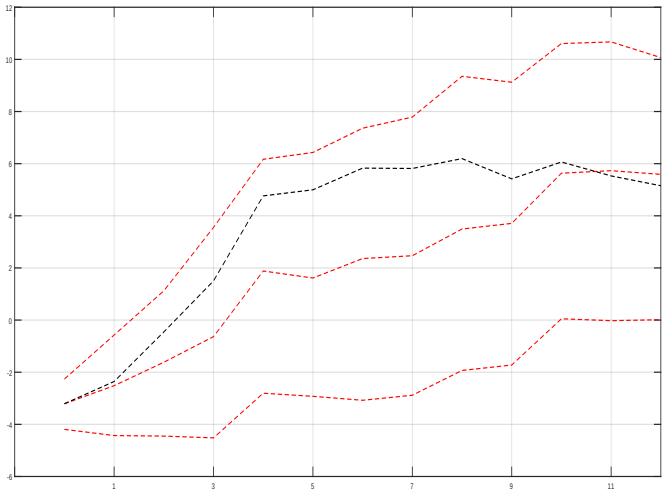
Note: The figure shows the impulse response of all the variables in the model to the QE shock (30 bp drop in the term spread). The red shaded area reflects the 16th–84th percentile range. The black dashed line, instead, is the median impulse response of the variables in the QE scenario in which the reaction of the short-term interest rate is offset by means of standard monetary policy shocks. HP: house prices; GDP: real gross domestic product; YED: GDP deflator; U: unemployment rate; R: nominal short-term interest rate; W: compensation per employee, wage; LTN: nominal long-term interest rate; SP: stock prices. EA: euro area; US: United States; DE: Germany; FR: France; IT: Italy; ES: Spain.

Figure C.2 Impulse Responses of Unemployment—Baseline IRFs (Solid) vs IRFs Generated Under Uniform Probability of Getting Employed (Dashed)



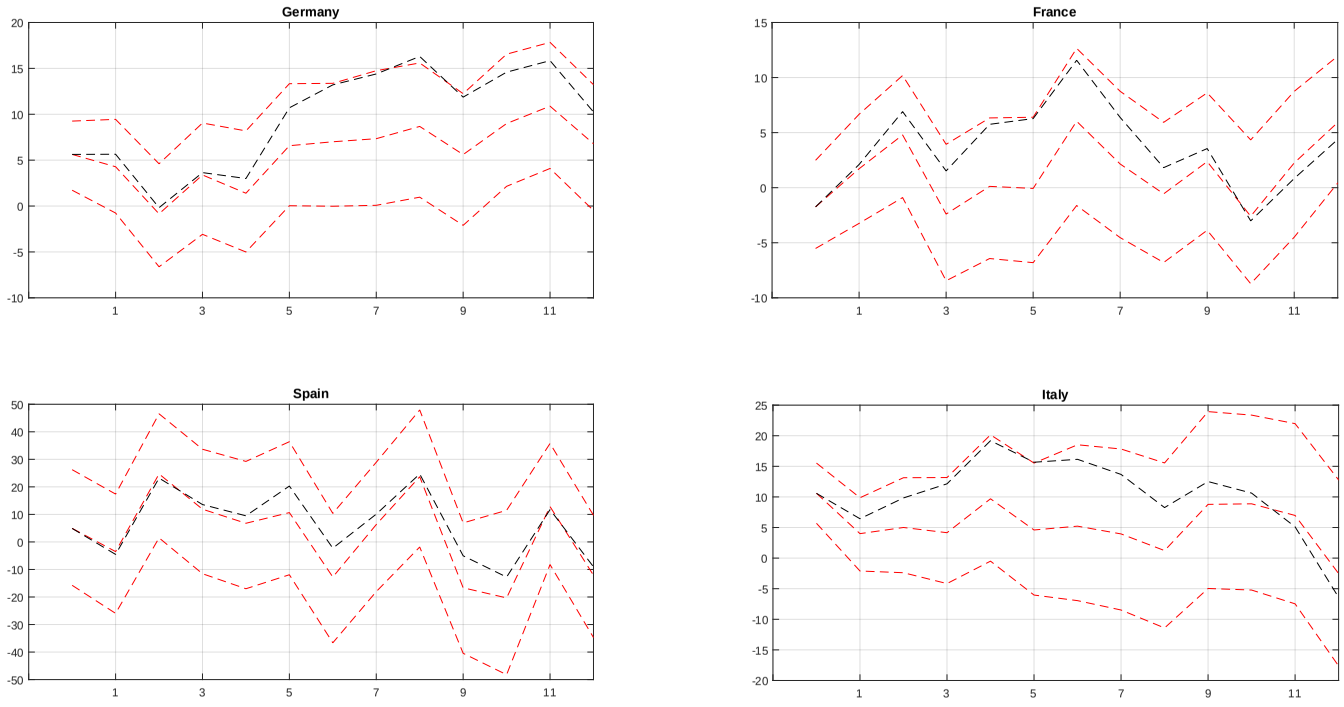
Source: Household Finance and Consumption Survey
Note: The charts show impulse responses of unemployment by income quintile.

Figure C.3 Response of Profits to Quantitative Easing Shock



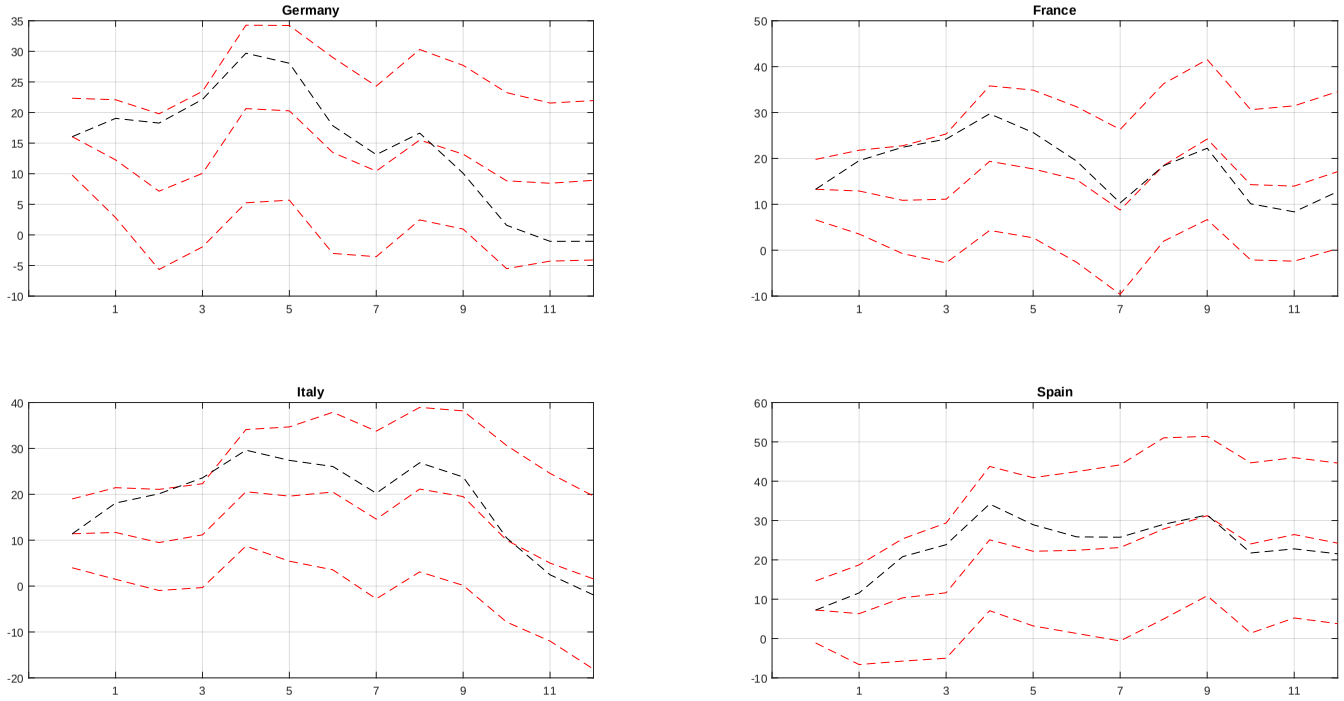
Note: The figure shows the impulse response of aggregate profits the quantitative easing shock. The responses are estimated by means of the local linear projection method of Jordà (2005). Red dashed lines: 16th, 50th and 84th percentiles of the responses to QE shock; black dashed line: median response to QE scenario where standard monetary policy shocks off-set the response of the policy rate to QE shock.

Figure C.4 Response of Net Property Income to Quantitative Easing Shock



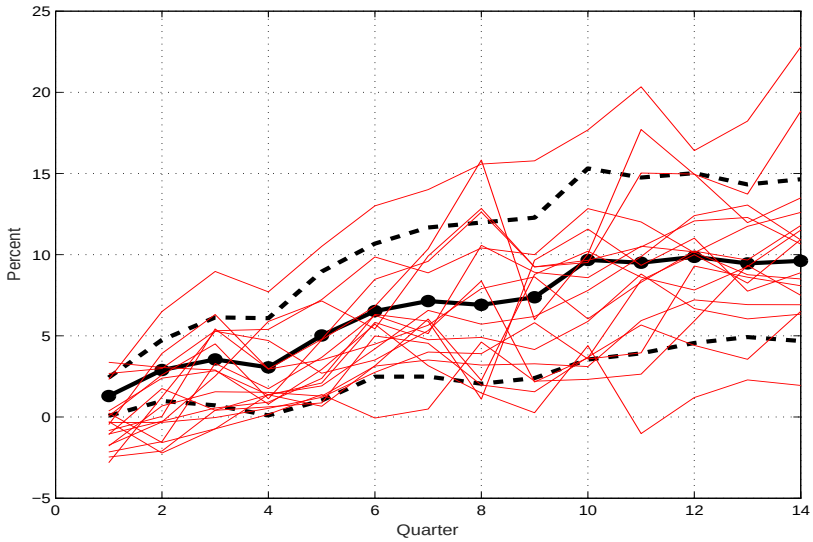
Note: The figure shows the impulse response of net-property income in the four countries to the quantitative easing shock. The responses are estimated by means of the local linear projection method of Jordà (2005). Red dashed lines: 16th, 50th and 84th percentiles of the responses to QE shock; black dashed line: median response to QE scenario where standard monetary policy shocks off-set the response of the policy rate to QE shock.

Figure C.5 Response of the Value of Household Stock Holdings to Quantitative Easing Shock



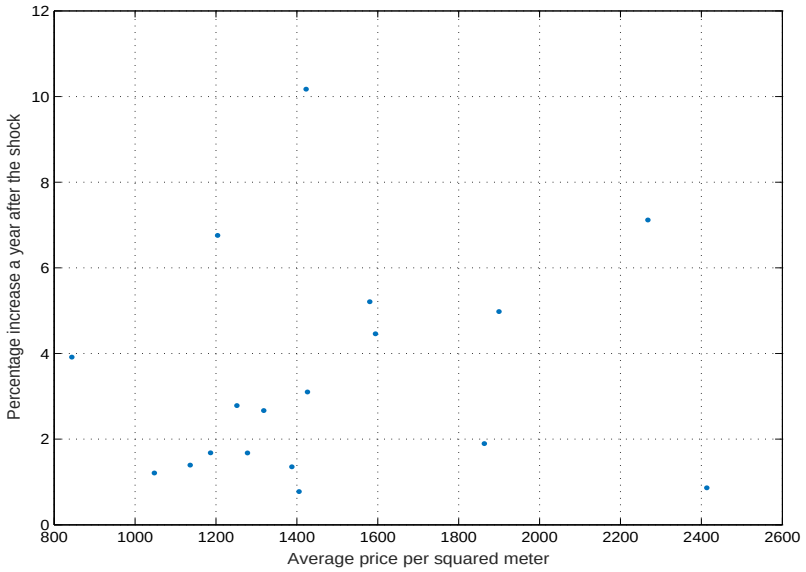
Note: The figure shows the impulse response of the value of the stock holdings of the households in the four countries to the quantitative easing shock. The responses are estimated by means of the local linear projection method of Jordà (2005). Red dashed lines: 16th, 50th and 84th percentiles of the responses to QE shock; black dashed line: median response to QE scenario where standard monetary policy shocks off-set the response of the policy rate to QE shock.

Figure C.6 Effects of Quantitative Easing on Local House Prices in Spain



Source: ENI/Ministerio de Fomento, Spain.
Note: The figure shows the impulse response to the quantitative easing shock of local house prices from Spanish provinces. The black lines refer to the 16th and 84th percentiles (dashed) and median (solid with dots) of the responses of the aggregate (national) house price. The red solid lines refer to the median responses of local house prices. The responses are estimated by means of the local linear projection method of Jordà (2005).

Figure C.7 Level of Local House Prices Across Spanish Regions vs Response to Quantitative Easing Shock after 4 Quarters



Source: ENI/Ministerio de Fomento, Spain.
Note: The figure shows the scatter plot of the responses of local house prices across Spanish provinces 4 quarters after the quantitative easing shock. The responses are plotting against the level of house prices (in EUR per square meter).

Table C.1 Estimates of the Effects of Nonstandard Monetary Policy Using Event Studies

Authors	Country	Type of Event	Typical Impact on 10-Year Rate (p.p.)	Notes
Altavilla et al. (2016)	DE, ES, FR, IT	OMT	0.2 to 1	
Altavilla et al. (2015)	EA, DE, ES, FR, IT	APP	0.3 to 0.5	
Andrade et al. (2016)	EA	APP	0.45	
Joyce and Tong (2012)	UK	APF1	1	
Christensen and Rudebusch (2012)	UK, US	APF1	0.43 to 0.89	
Lam (2011)	JP	CME+	0.24 to 0.27	
Fukunaga et al. (2015)	JP	QQE	0.33 to 0.47	
Gagnon et al. (2011)	US	LSAP1	0.55 to 1.05	
Krishnamurthy and Vissing-Jorgensen (2013)	US	LSAP1, LSAP2, MEP	0.07 to 1.07	
Bauer and Rudebusch (2014)	US	LSAP1	0.89	
Krishnamurthy and Vissing-Jorgensen (2011)	US	LSAP1, LSAP2	0.3 to 1.07	
Cahill et al. (2013)	US	LSAP1, LSAP2, MEP	0.089 to 0.131	for $100bn purchases

Notes: See also Andrade et al. (2016), Appendix B for other studies and details. Abbreviations: OMT—Outright Monetary Transactions (Announcement), APP—Asset Purchases Programmes, APF—Asset Purchase Facility, CME—Comprehensive Monetary Easing, QQE—Quantitative and Qualitative Monetary Easing, LSAP—Large Scale Asset Purchase Program, MEP—Maturity Extension Program.

Table C.2 Estimates of the Effects of Nonstandard Monetary Policy Using VARs

Authors	Method (Country)	Type of Event	Effect on Real Economy and Inflation
Altavilla et al. (2016)	VAR (DE, ES, FR, IT)	OMT	Real GDP: 0.34%–2.01%, HICP: 0.28%–1.21%
Baumeister and Benati (2013)	TVP VAR (US, UK)	LSAP	Inflation: trough of −1% to −4% GDP gr: trough −10% to −12%, UR: peak 10.6%
Kapetanios et al. (2012)	TVP VAR (UK)	BoE LSAP	Real GDP: peak effect of 1.42%
Weale and Wieladek (2016)	Bayesian VAR (US, UK)	LSAP	Real GDP: 0.25%–0.58%, CPI: 0.32%–0.62%
Gambacorta et al. (2014)	Panel VAR (EA, non-EA countries)	Various	GDP: −0.25% to 0.25%, CPI: −0.12% to 0.10%
Darracq-Paries and De Santis (2015)	Panel VAR (EA countries)	3-year LTROs	GDP: peak of 0.8%, GDP Defl: peak of 0.35%
Babecka Kucharcukova et al. (2016)	VAR (EA, non-EA countries)	Spillovers from ECB QE	IP: −0.2% to 0.2%, HICP: −0.1% to 0.06%
Bluwstein and Canova (2016)	Bayesian SVAR (EA, EU countries)	Spillovers from ECB QE	IP: −0.1% to 0%, CPI: 0%–0.5%
Hachula et al. (forthcoming)	SVAR (EA, EA countries)	LTROs	GDP: 0.1%–0.65%, CPI: 0%–0.45% UR: −0.21%–0.07%
Behrendt (2017)	SVAR (EA)	ECB QE	IP −0.0032%–0.0023%, HICP −0.0006%–0.0005%
Boeckx et al. (2017)	SVAR (EA, EA countries)	3Y LTRO, CBPP1	GDP: −0.35%–0.6%, HICP: −0.1%–0.3%

Notes: See also Andrade et al. (2016), Appendix B for other studies and details. Abbreviations: OMT—Outright Monetary Transactions, LSAP—Large Scale Asset Purchase Program, LTROs—long-term refinancing operations, CBPP1—Covered Bond Purchases Program.

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