

What Impact Does Helicopter Money Have on Inflation?

Thomas Renault and Baptiste Savatier⁽¹⁾

The aim of this *Focus* is to estimate the impact of a direct transfer to households –such as helicopter money– on inflation in the euro area. As helicopter money has never been implemented by a central bank, we first review the literature on the effects of fiscal policies on inflation. We then propose two approaches to assess the impact of such a shock on inflation using existing macroeconomic data. First, we search the literature for estimates of transfer/consumption and consumption/inflation elasticities. This allows us to propose an estimate of the impact on inflation of a positive shock on consumption caused by a monetary transfer. Secondly, we carry out an empirical study on German data by analysing the impact of an exogenous fiscal shock on inflation.

Introduction

Inflation in the euro area has been low and below target since 2013. The unconventional measures implemented for almost a decade now have not allowed the European Central Bank (ECB) to achieve its inflation target: “close to but below 2%”. Inflation forecasts also remain well below the ECB’s target. In ECB Executive Board Member Philip Lane’s words: “Narrowing the gap to our inflation target will be on the agenda of the Governing Council in the coming years”.

Various solutions are proposed in the *CAE Note* “What Else Can the European Central Bank Do?” (Martin, Monnet and Ragot, 2021) to increase inflation. One of them is helicopter money. In this *Focus*, our aim is not to debate the different solutions, but to estimate its effect on inflation if this were to be implemented in the Euro area. This is not an easy task. First of all, helicopter money has never been implemented in history. This implies that we will have to draw on different exogenous shocks that may be close to

This Focus is published under the responsibility of its authors and is not binding on anyone else.

We thank Paul Hubert, Christophe Blot and Giovanni Ricco for their advice, as well as Bernd Hayo, Matthias Uhl and Sascha Mierzwa for sharing the data for Germany and advising on the database analysis.

(1) Respectively Université Paris 1 Panthéon-Sorbonne and CAE; CAE.

helicopter money, but not identical, namely fiscal transfers and tax cuts for households.⁽²⁾ Helicopter money is indeed equivalent to a fiscal transfer in a context of accommodating monetary policy. Second, it is difficult to estimate what percentage of the money distributed would be spent –although we can get some orders of magnitude– and how this money would be spent (durable goods, imported goods, services...). Third, the impact of a transfer to households on inflation could depend on the economic cycle. In the current period, with supply constraints due to health restrictions (notably lockdown), very low interest rates, and an excess of aggregate savings accumulated during the Covid-19 crisis, the effects that helicopter money could have could be quite different from those that could be expected in a less turbulent economic situation. Fourth, the impact on inflation may depend on expectations and surprise at the introduction of the measure. Finally, we cannot rule out country-specific magnitude of the effect, with the final impact on euro zone inflation being difficult to measure.

Despite all these limitations, we have reviewed the literature and estimated –even with a large error interval– how inflation in the euro area might evolve in the case of helicopter money. According to the various approaches, we estimate that a transfer of 2% of the euro area GDP –i.e. 240 billion euros in total; which amounts to 770 euros per adult over 15 years old– would lead to an increase in inflation of about 1%.

In this *Focus*, we use three approaches to estimate the effect on inflation of a direct transfer to households:

- The use of transfer/consumption and consumption/inflation elasticities;
- A literature review on the impact of an exogenous shock on inflation;
- Modelling an exogenous fiscal shock in a Local Projection Model.

1. What methods can be used to measure the effect of a shock on inflation?

1.1. Elasticity and cross-elasticity

In the absence of historical data on a helicopter currency, the first method involves considering the cross-elasticity of transfers and consumption on inflation. Concerning the first elasticity, the literature estimates a marginal propensity to consume (MPC) between 0.3 and 0.7 (see table below). Its value is very heterogeneous depending on the country and wealth. For example, Drescher, Fessler and Lindner (2020) use the *Eurosystem Household Finance and Consumption Survey* (HFCS)⁽³⁾ which covers a representative sample of 17 European countries. They find an average PMC of 0.47 but ranging from 0.33 in the Netherlands to over 0.55 in Lithuania, 0.42 in France, 0.51 in Germany, and 0.48 in Italy. Their results are in line with those in the existing literature (see e.g. Jappelli and Pistaferri (2014) for Italy, and van Rooij and de Haan (2019) for the Netherlands). Van Rooij and de Haan (2019) add that the source of this transfer, Treasury or Central Bank, does not affect how it is spent.

(2) Ideally, one would like to measure the impact of a transfer in the form of social benefits rather than the impact of a tax cut. The former is indeed closer to the form that helicopter money could take. But the amounts of social transfers are in the vast majority of cases indexed to inflation. In other words, they are increased in response to inflation. This exogeneity problem is so important and pervasive that the literature does not propose a causal estimate of social benefits on inflation (Romer and Romer, 2016).

(3) This analysis is made possible by the addition of the following question to the HFCS conducted in 2017: “Imagine you unexpectedly received money from a lottery equal to the amount of your household income in one month. What percentage would you spend over the next 12 months on goods and services, as opposed to any amount you would save for later or use to repay loans?”.

Table. Impact of a fiscal shock on the marginal propensity to consume

Source	Methodology	Estimation of MPC
Drescher, Fessler and Lindner (2020)	European survey in 2017 in 17 European countries	Average: 46.9%, Mode: 50% (41.8% France; 51.3% Germany; 48.1% Italy; 32.9% Netherlands)
Jappelli and Pistaferri (2014)	Italian survey in 2010	Average = 48% (heterogeneity by <i>cash-on-hand</i>)
Rooij and de Haan (2019)	Dutch survey in 2016 calling for MPC of HM vs. the government (2 amounts: 500 and 2,000 euros)	On average: 30% (Netherlands), 34% if 500 euros, 28% if 2000, large heterogeneity between individuals, none between ECB vs. government
Kim and Lee (2020)	Survey on how the cheque was spent small-local South Korean business to spend between May and August 2020	70% spent (but not a MPC, forced to spend it or lose it)
Carroll, Slacalek, Tokuoka and White (2017)	Theoretical models with heterogeneity (Krusell-Smith and Friedman-Buffer Shock)	MPC in annual terms: 0.09 average, top 1%/bottom 20% income or wealth: 0.04/0.19, unemployed: 0.18
Gross, Notowidigdo and Wang (2020)	Estimation from credit data in the United States following a withdrawal from the <i>bankruptcy flag</i> (thus specific sub-population: <i>subprime borrowers</i>) at different periods in the economic cycle. NB: In reality, the marginal propensity to borrow is measured	MPC: 0.37 on average/0.34 in 2004 vs 0.46 in 2008/correlated with unemployment rate

Source: Authors.

However, the value of the MPC depends on the type of transfer and whether the transfer is temporary or permanent. Hence the inference from these studies to an HM MPC is limited. A case of a time-limited transfer is analysed by Kim and Lee (2020). They study a Korean Treasury coupon offered to all households in May 2020, which could only be spent in small local shops before August 2020, and whose amount varied according to the composition and location of the household. On average, a three-person household received the equivalent of \$799 (or 1.7% of annual household income in 2019). The authors study the effect through a representative survey of 2,000 participants to find out how much was spent and how. They find that households spent over 70% of the transfer, mainly on current consumption, whereas an unrestrained MPC in Korea would typically be around 28% (Song, 2020).

These studies are based on surveys rather than direct observation of consumption. However, this does not jeopardise the inference of these results to a real situation. Parker and Souleles (2019) have shown that the *reported* effects method, through a survey, produces estimates that are on average close to the *revealed* preferences method –through experiments and quasi-experiments– and would even underestimate them for low-income households.

In order to estimate the impact on inflation of a consumption increase, we analyse the effect of a standard exogenous monetary policy shock (i.e. on the interest rate) on these two variables. Under the assumption that inflation responds to monetary policy through its effect on aggregate demand (consumption), we can deduce the impact of an exogenous consumption shock on inflation. For this purpose, we use the euro area monetary shock series proposed by Kerssenfischer (2019). From these different estimates, we find that a monetary transfer has an impact of the same magnitude on consumption and inflation at a one-year horizon.

Taking into account the effect of a transfer to households (social benefits, etc.) on consumption estimated in various academic works (i.e. the marginal propensity to consume), we therefore estimate that a monetary transfer of 1 point of GDP would lead to an increase in consumption of 0.5% and an increase in inflation of 0.5 points.

1.2. Literature on narrative approaches

A more direct method consists of modelling –through a VAR or *Local Projection* model– the impact of a shock on inflation without going through cross-elasticity. It is important in these approaches to focus on fiscal measures (direct transfers or tax cuts) that are exogenous, i.e. whose implementation is not linked to the economic cycle. This so-called narrative approach –which aims to first construct an exogenous series of shocks and then modelling its impact– has been used by many authors (for a review of this literature see Ramey, 2016). Romer and Romer (2016) survey social transfers in the United States over the 1952-1991, and manually select those unrelated to the cycle. Unfortunately, their data is restricted to that country, and to our knowledge no equivalent exists in France or any other European country. Moreover, they also show that each social transfer is explicitly counteracted by monetary policy in order to prevent inflation, thus preventing the assessment of its effects on the latter.

Lacking data on social transfers, we focus on fiscal policy shocks, for which there is more data, and which are less likely to be countered by monetary policy. Other researchers have assessed the effect of a narrative fiscal series in European countries. Among others, Cloyne (2013) estimates the effect in the UK, Hayo and Uhl (2014) in Germany, Gil *et al.* (2018) in Spain, Pereira and Wemans (2015) in Portugal, and finally van der Wielen (2020) provides an estimate for the whole euro area. However, these studies focus on the effect on GDP growth, and only include inflation as a control variable, usually without reporting its result. As such, only van der Wielen (2020) estimates that a fiscal expansion of one percentage point increases inflation by 0.43 percent at the one-year horizon; and Cloyne (2013) *op. cit.* finds an effect of about 0.6 percent in the 5th quarter after the shock.

2. An empirical estimate

2.1. Linear model

Given the little interest in the effects on inflation of such narratives estimation and the absence of a French narrative data series,⁽⁴⁾ we analyse in this second part such effect on German data.

As our fiscal shocks are exogenous, we do not need to perform a structural identification in the VAR model, and thus favour a *Local Projection* à la Jordá (2005). Indeed, if properly specified, both models have the same response function (Plagborg-Møller and Wolf, 2021).

We therefore study such a shock in Germany, based on the data compiled by Uhl (2013) and exploited in Hayo and Uhl (2014), but where the effect on inflation is not reported. These data identify fiscal shocks from 1965 to 2013.⁽⁵⁾ It codes a shock as a percentage of GDP in the quarter corresponding to the publication of the law establishing the shock. It excludes social transfers, and classifies the rest into 5 categories, 3 of which are endogenous (spending driven, countercyclical policies, and driven by a macroeconomic shock) and 2 exogenous (structural and consolidation). From this list, we have retained the latter. Temporary shocks take on their negative value when they expire. Since our interest lies in inflation, it is necessary to check that our results are not only driven by VAT measures, which directly affect the price level. Therefore, we also test an estimate without VAT measures, the results of which are in the appendix.

We complete the series with data from Monnet and Puy (2021), a long and granular (in quarters) series compiling IMF data from 1950 to 2019, for the inflation rate and growth rate, and the unemployment rate from FRED (St Louis Fed). Consistent with the data on fiscal shocks, the series are only for the Federal Republic of Germany (FRG) before reunification and are chained to the later data using growth rates. The interest rate is the Bundesbank policy rate before 2000 and the ECB policy rate thereafter.

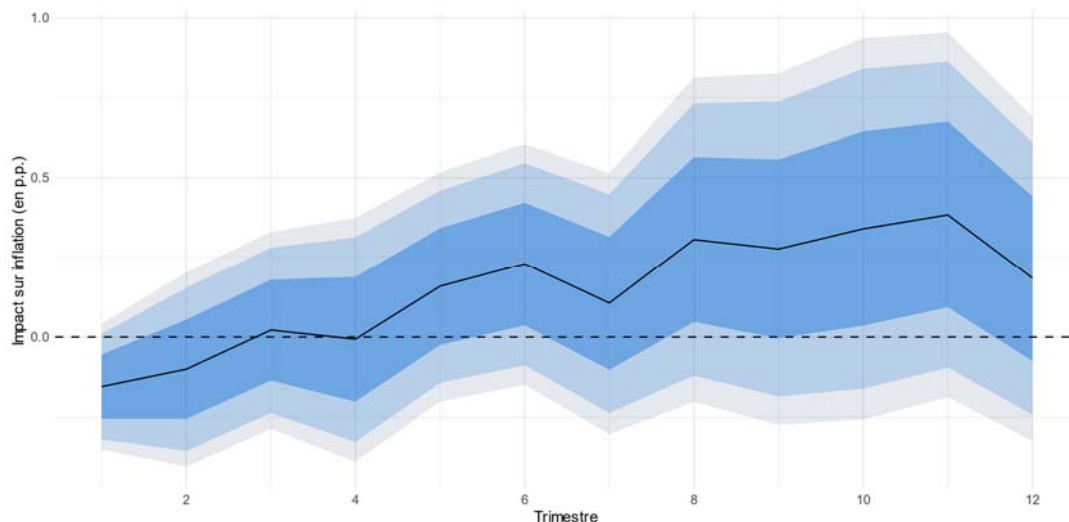
Then we estimate the effect of an exogenous fiscal shock on inflation by controlling for real growth, unemployment and the central bank's policy rate.

(4) The data used by van der Wielen (2020) *op. cit.* is confidential.

(5) Data refer to the Federal Republic of Germany before 1991, then to reunified Germany afterwards.

Figure 1 shows the linear results for Germany. We report the 95, 90 and 68% confidence intervals. According to our estimates, on average, we observe the effect of an exogenous tax cut of one percentage point of GDP in quarter 0 on inflation from the 6th quarter onwards, where it increases by 0.22 percentage points, and up to 0.36 in the 11th quarter.

Figure 1. Effect of an exogenous tax cut of 1 GDP point on inflation over a 12-quarter horizon in Germany



Source: Authors based on data from Hayo and Uhl (2014).

2.2. Cycle-specific model

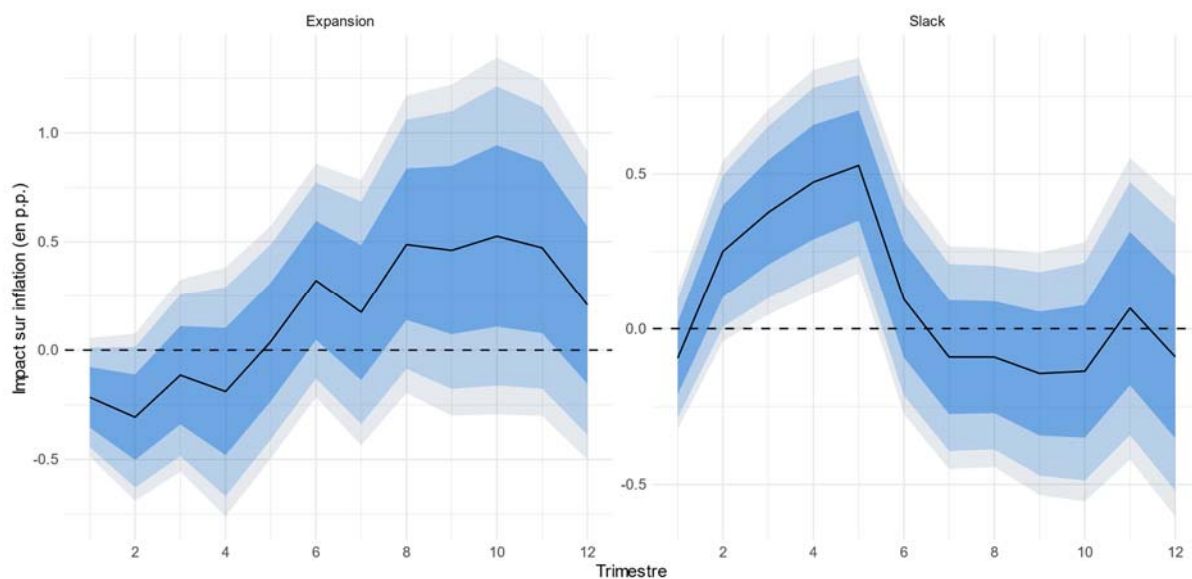
The results of the papers cited above using narrative shocks are not necessarily inferable to the current situation. First, the data used is often old, and some authors have shown that the results are largely driven by shocks from the 1970s and 1980s.⁽⁶⁾ Second, it is questionable what the effect would be in a period such as the current one, characterised by very low interest rates. In the current economic climate, an unexpected shock like helicopter money could have a very different impact depending on the economic cycle and agents' propensity to save. Moreover, at the bottom of the cycle, it is possible that monetary policy will be less effective in counteracting the fiscal shock (as is the case with helicopter money).

We therefore test this model in two different states of the economy. Indeed, neo-Keynesian theory predicts that the inflationary effect of a fiscal expansion is zero if the economy is in a stationary state, i.e. if potential growth is zero. However, potential growth is unobservable. Thus, we follow Auerbach and Gorodnichenko (2012) in assuming that the economy grows 80% at about its potential and 20% below. We take the historical values of German growth and label the lowest quintile as a period of slack (i.e. growth below potential) and the rest as a period of expansion. On this definition of the cycle, we differentiate the effect of the fiscal shock on inflation.

Figure 2 shows the results for Germany in these two cycles.

(6) In the appendix we also analyse the effect of the shock on inflation by restricting the period from 1975 onwards, which has the effect of tempering the inflationary effect of the fiscal expansion.

Figure 2. Effect of an exogenous tax cut on inflation in Germany, depending on the state of the economy, 12 quarters ahead



Source: Authors based on data from Hayo and Uhl (2014).

We identify a much stronger initial effect of a shock in a downturn. An exogenous tax cut of one percentage point would raise inflation by 0.5 percentage points over a six-month horizon. However, it falls to around zero after Q6. The boom estimate also has an inflationary effect similar to the linear model, up to 0.5 in Q10. This estimate is close to the results of the literature (Cloyne, 2013; van der Wielen, 2020) on fiscal shocks in England and the euro area. Compared to a helicopter money, this estimate can be considered as a lower bound, since the inflationary effect of such a fiscal shock can be partly absorbed by imports. However, helicopter money is equivalent to such a fiscal shock, but coordinated between all the countries in the zone, and therefore with little import leakage effect.

Conclusion

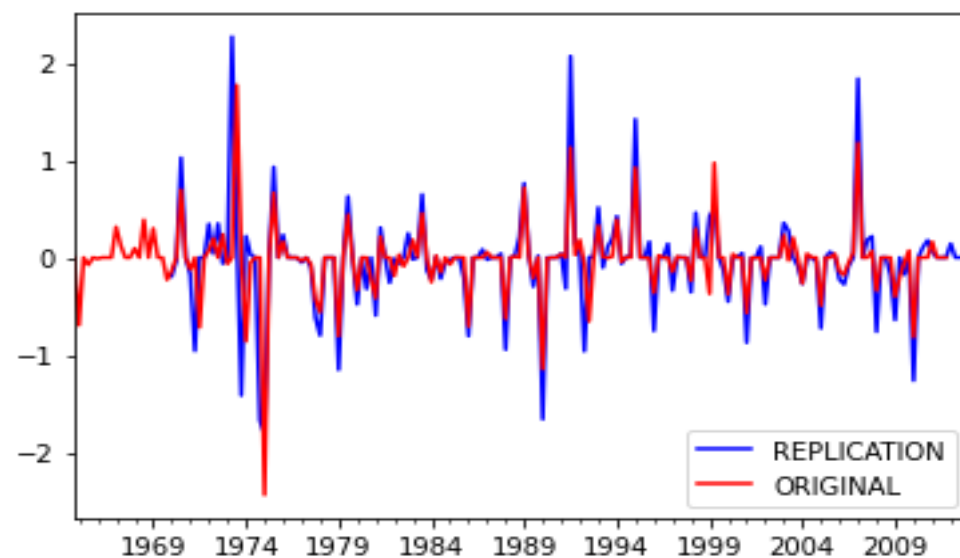
Although this work has many limitations, all our approaches (elasticities, literature review and modelling) allow us to estimate that a fiscal transfer of 2 GDP points in helicopter money would allow the ECB to reach its target by increasing inflation in the euro area by about 1 point. The impact on inflation would naturally depend on the credibility of the ECB and the coordination with Member States' respective fiscal policies, as underlined and developed in Martin, Monnet and Ragot (2021) *op. cit.* One ought to acknowledge the existence of a scenario with an impact on the exchange rate rather than on inflation. Yet it is not the one we favour.

If "inflation is always and everywhere a monetary phenomenon", and even without fully believing in the quantitative theory of money, it seems to us that there must be a level of transfer that enables the ECB to reach its target. We therefore propose an estimate we believe conservative and suggest the amount of the transfer to be increased later. The aim would be to conduct an experiment, whose duration and amount would vary depending on what best and most rapidly raises inflation to a level close to 2%.

Because of its unprecedented nature, the impact of helicopter money on inflation is difficult to estimate precisely. However, our analysis of the literature, the consideration of transfer/consumption elasticities and our empirical analysis tend to confirm a positive, albeit limited, effect of a shock on inflation. In all three cases, the orders of magnitude are close: a transfer of 1 point of GDP leads to an increase in inflation of around 0.5 points. In this relationship, expectations will play a key role, hence the importance of the ECB's credibility in implementing this policy. Nevertheless, the hyperinflation scenario –often presented by the critics of helicopter money– is not supported by the various existing studies.

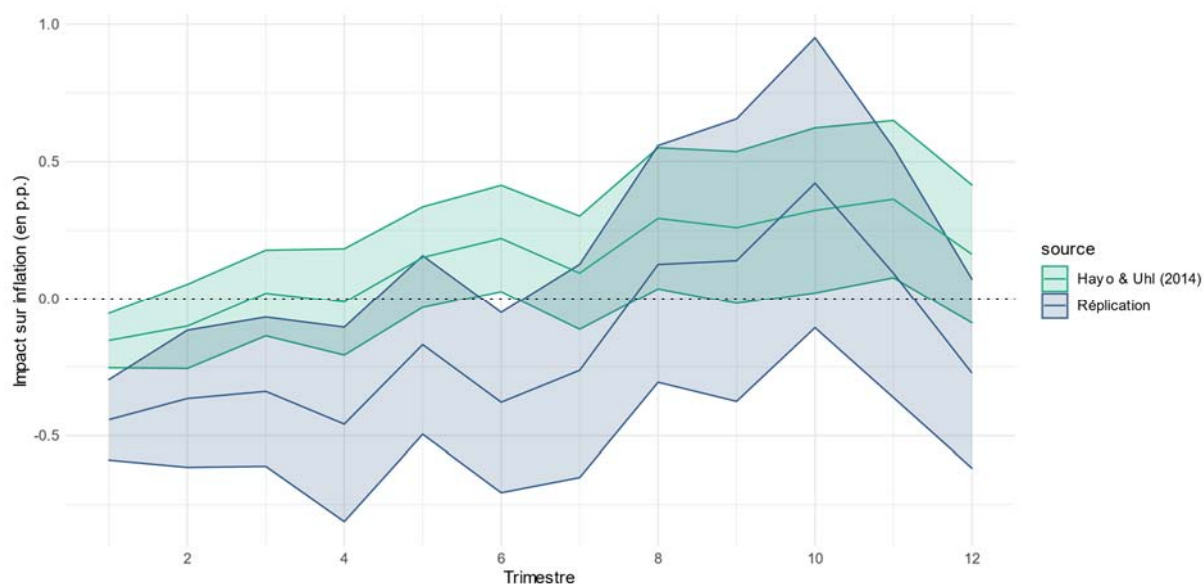
Appendix

Figure A1. Shock identified in Hayo and Uhl and shock reconstructed from the reference file by deleting the VAT shocks and keeping only the C and S measures



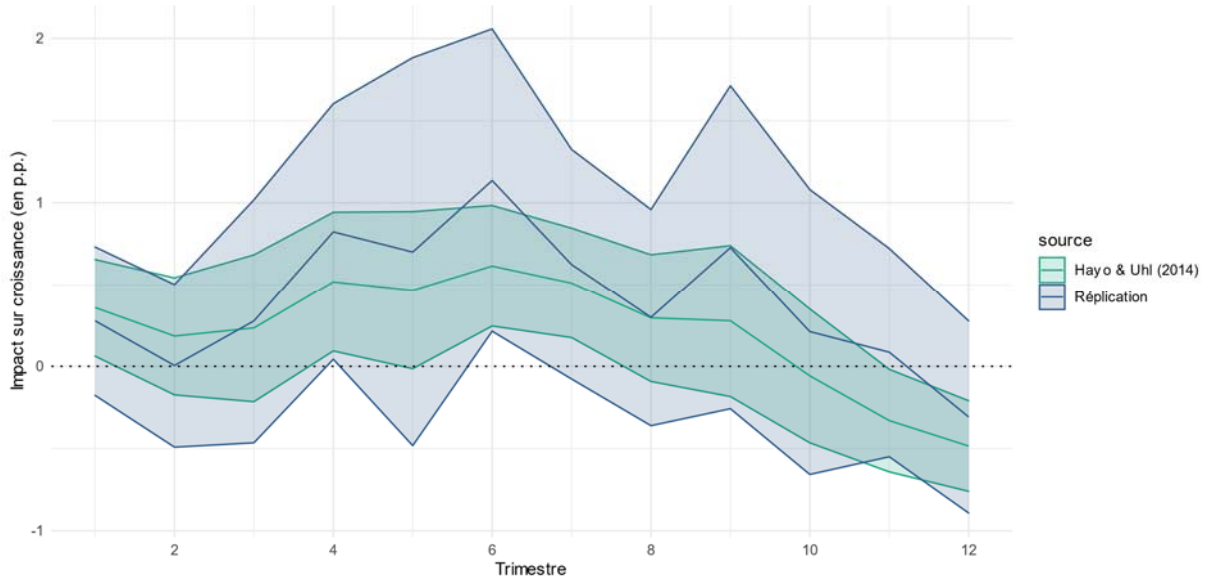
Source: Authors based on data from Hayo and Uhl (2014).

Figure A2. Comparison of the effect of an exogenous tax cut of 1 point of GDP on inflation



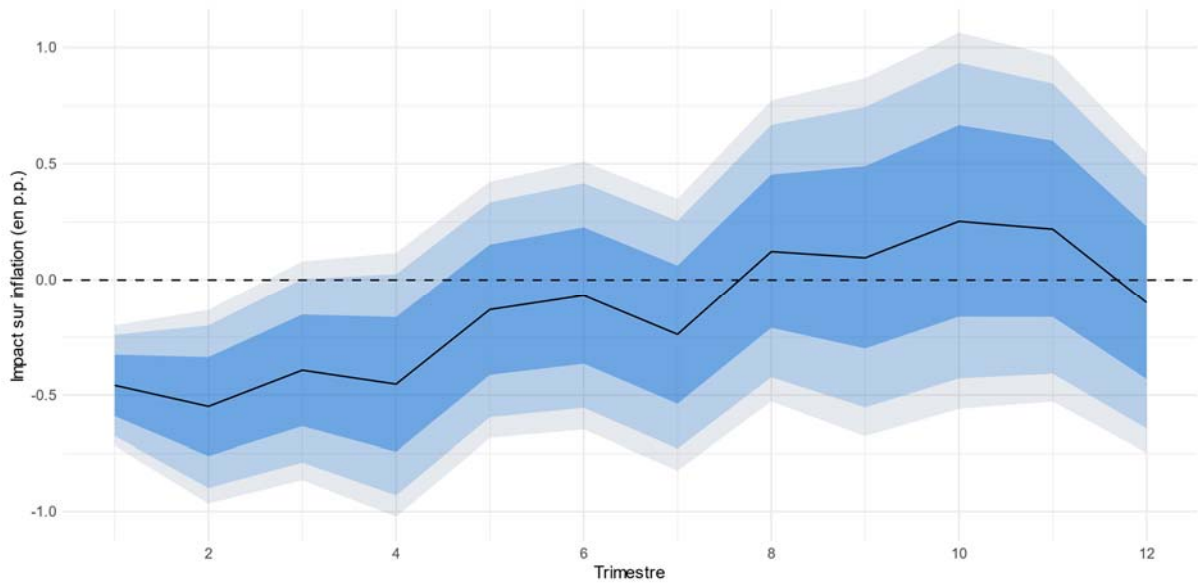
Source: Authors based on data from Hayo and Uhl (2014).

Figure A3. Comparison of the effect of an exogenous tax cut of 1 point of GDP on growth



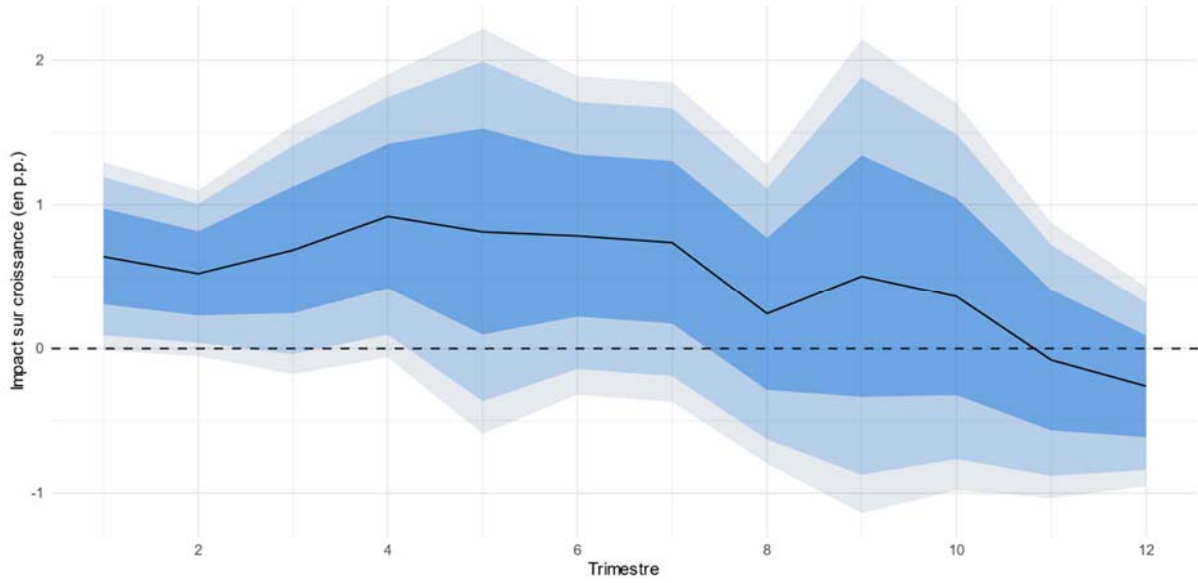
Source: Authors based on data from Hayo and Uhl (2014).

Figure A4. Effect of an exogenous tax increase of 1 GDP point on inflation, restricted period 1975-2013



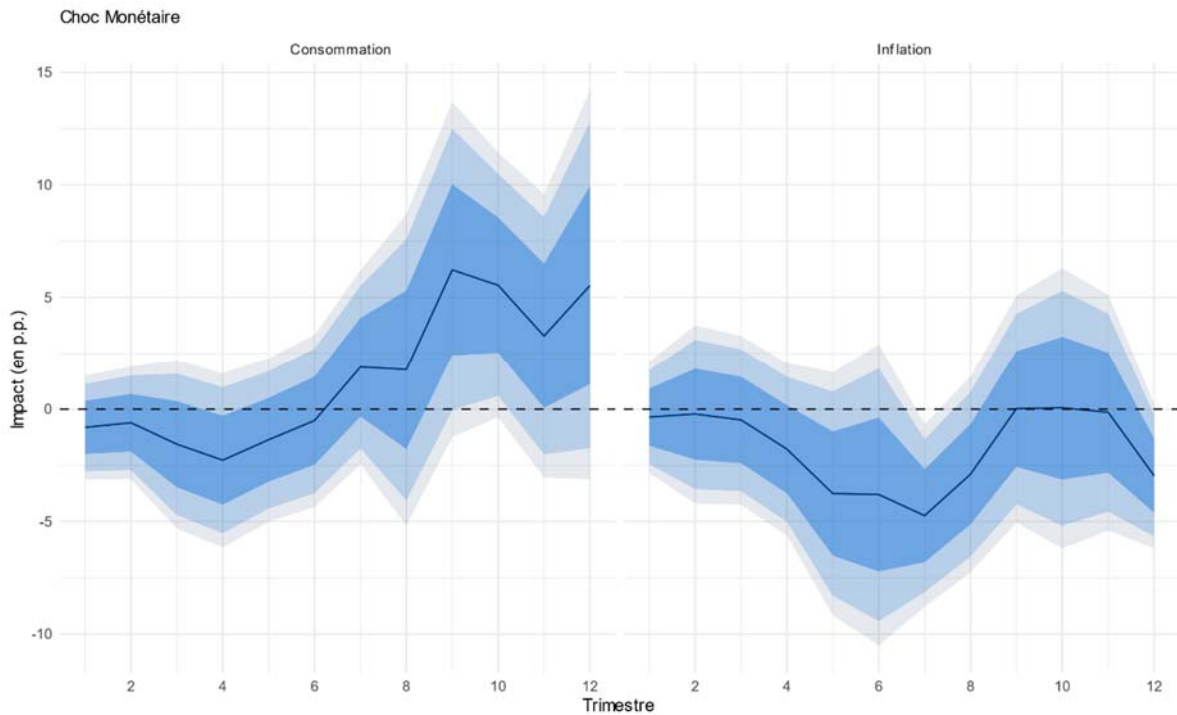
Source: Authors based on data from Hayo and Uhl (2014).

Figure A5. Effect of an exogenous tax increase of 1 GDP point on growth, restricted period 1975-2013



Source: Authors based on data from Hayo and Uhl (2014).

Figure A6. Effect of an exogenous increase in the ECB interest rate on consumption and inflation



Source: Authors based on data from Kersefischer (2019).

Bibliographic References

Auerbach A.J. and Y. Gorodnichenko (2012): “Measuring the Output Responses to Fiscal Policy”, *American Economic Journal: Economic Policy*, vol. 4, no. 2.

Carroll C., J. Slacalek, K. Tokuoka and M.N. White (2017): “The Distribution of Wealth and the Marginal Propensity to Consume”, *Quantitative Economics*, vol. 8, no. 3.

Cloyne J. (2013): “Discretionary Tax Changes and the Macroeconomy: New Narrative Evidence from the United Kingdom”, *American Economic Review*, vol. 103, no. 4.

de Castro Fernández F. and P. Hernández de Cos (2006): “The Economic Effects of Exogenous Fiscal Shocks in Spain: A SVAR Approach”, *ECB Working Paper*, no. 647.

Djuric B.U. and M. Neugart (2021): “Helicopter Money: Survey Evidence on Expectation Formation and Consumption Behaviour”, *Oxford Economic Papers*, vol. 73, no. 1.

Drescher K., P. Fessler and P. Lindner (2020): “Helicopter Money in Europe: New Evidence on the Marginal Propensity to Consume Across European Households”, *Economics Letters*, no. 195.

Gil P., F. Martí, R. Morris, J.J. Pérez and R. Ramos (2019): “The Output Effects of Tax Changes: Narrative Evidence from Spain”, *Springer Link SERIES*, vol. 10, no. 1-23.

Gross T., M.J. Notowidigdo and J. Wang (2020): “The Marginal Propensity to Consume over the Business Cycle”, *American Economic Journal: Macroeconomics*, vol. 12, no. 2.

Hayo B. and M. Uhl (2014): “The Macroeconomic Effects of Legislated Tax Changes in Germany” *Oxford Economic Papers*, vol. 66.

Jappelli T. and L. Pistaferri (2014): “Fiscal Policy and MPC Heterogeneity”, *American Economic Journal: Macroeconomics*, vol. 6, no. 4.

Jordá O. (2005): “Estimation and Inference of Impulse Responses by Local Projections”, *American Economic Review*, vol. 95, no. 1.

Kerssenfischer M. (2019): “Information Effects of Euro Area Monetary Policy: New Evidence from High-Frequency Futures Data”, *Deutsche Bundesbank Discussion Paper*, no. 07/2019.

Kim M.J. and S. Lee (2020): “Can Stimulus Checks Boost an Economy under COVID-19? Evidence from South Korea”, *IZA Discussion Paper*, no. 13567.

Martin P., E. Monnet and X. Ragot (2021): “What Can the European Central Bank Still Do?”, *Note du CAE*, no. 65, June.

Monnet E. and D. Puy (2021): “One Ring to Rule Them All? New Evidence on World Cycles”, *CEPR Discussion Paper*, no. DP15958.

- Parker J., N. Souleles, N. Johnson and R. McClelland (2019): “Consumer Spending and the Economic Stimulus Payments of 2008”, *American Economic Review*, vol. 103, no. 6.
- Pereira M.C. and L. Wemans (2015): “Output Effects of a Measure of Tax Shocks Based on Changes in Legislation for Portugal”, *Hacienda Pública Española*, vol. 215, no. 4, January.
- Plagborg-Møller M. and C.K. Wolf (2021): “Local Projections and VARs Estimate the Same Impulse Responses”, *Econometrica*, vol. 89, no. 2.
- Ramey V. (2016): “Macroeconomic Shocks and their Propagation”, *Handbook of Macroeconomics*, no. 2.
- Ramey V.A. (2011): “Identifying Government Spending Shocks: It's all in the Timing”, *The Quarterly Journal of Economics*, vol. 126, no. 1.
- Romer C.D. and D.H. Romer (2016): “Transfer Payments and the Macroeconomy: The Effects of Social Security Benefit Increases, 1952-1991”, *American Economic Journal: Macroeconomics*, vol. 8, no. 4.
- Rooij M.V. and J. de Haan (2019): “Would Helicopter Money Be Spent? New Evidence for the Netherlands”, *Applied Economics*, vol. 51, no. 58.
- Song Sy (2020): “Leverage, Hand-to-Mouth Households, and Heterogeneity of the Marginal Propensity to Consume: Evidence from South Korea”, *Review of Economics of the Household*, vol. 18, no. 4.
- van der Wielen W. (2020): “The Macroeconomic Effects of Tax Changes: Evidence Using Real-Time Data for the European Union”, *Economic Modelling*, vol. 90.