ECB-Originating Monetary Shocks & Non-Euro EU Member States

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Abstract

Research Question(s): Whether and how the ECB-originating monetary shocks influence monetary policies in the non-Euro EU member states?

Method(s): Microeconometric techniques investigating if and how different monetary shocks influence policy rates setting in Czechia, Hungary, Poland, and Romania.

Conclusion(s): Impact of ECB-originating monetary shocks on estimated probabilities of policy rates changes in non-Euro EU member states cannot be confidently ruled out, but more research needed.

Overview

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Introduction

Motivations

Investigating *monetary policy trilemma* has two main motivations in the context of the EU member states:

1. the question of whether to **wait to join the Euro zone**; and
2. the recent changes to macroeconomic modelling:
   a. inclusion of the financial sector in modelling,
   b. *Zero Lower Bound* (ZLB) more problematic,
   c. *lean* vs. *clean* debate, and
   d. *Heterogenous Agent New Keynesian* models.

Research Questions & Objectives

Research Question (1): Do the ECB-originating monetary shocks influence monetary policies in the non-Euro EU member states?

Research Question (2): How do the ECB-originating monetary shocks influence monetary policies in the non-Euro EU member states?

This includes asking the following questions:

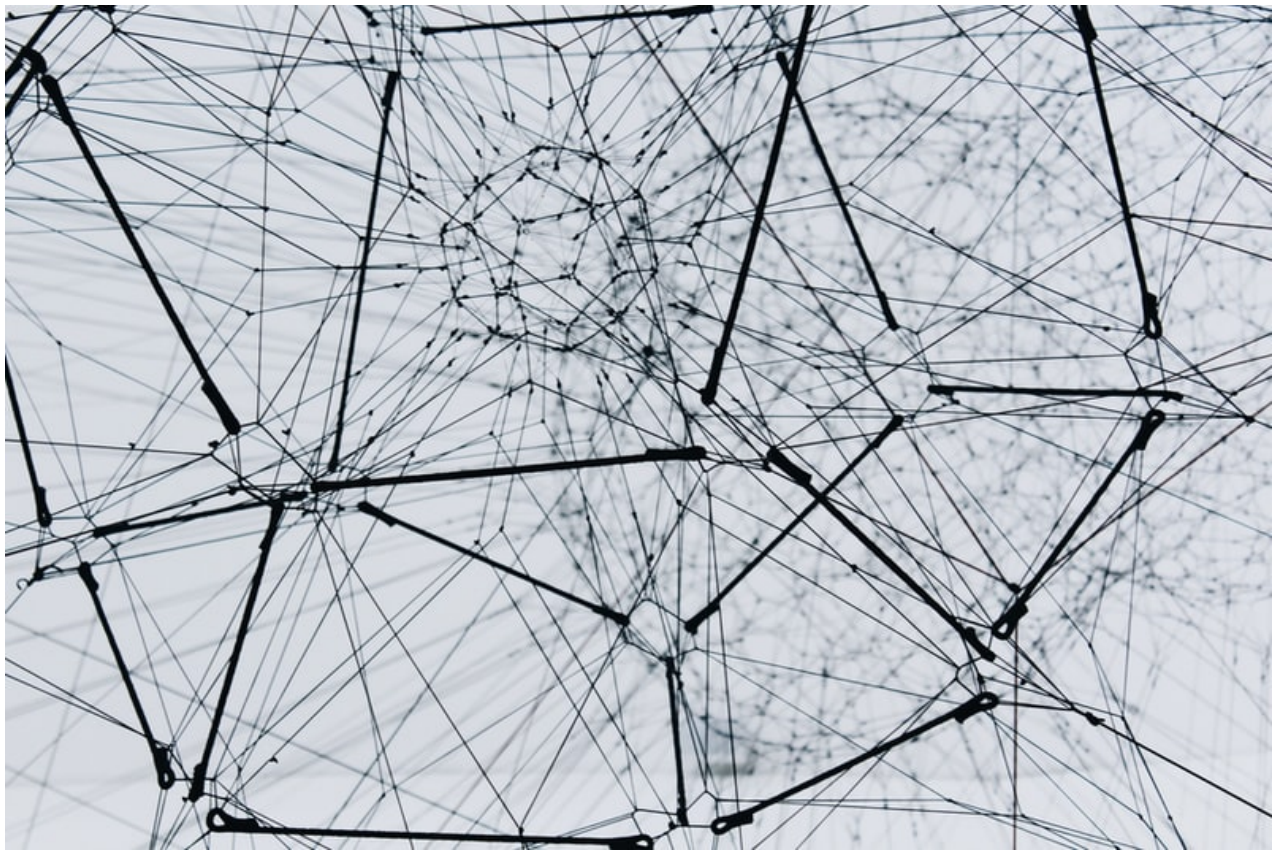
- Is there evidence of monetary policy contagion from the ECB?
- If so, what's the magnitude of contagion?
- Is the *contagion coefficient*'s sign positive or negative?
- Is there some theory backing the relationship?

What Conclusions I Reach

RE Logit: Impact of ECB-originating monetary shocks on estimated probabilities of policy rates changes in non-Euro EU member states cannot be confidently ruled out.

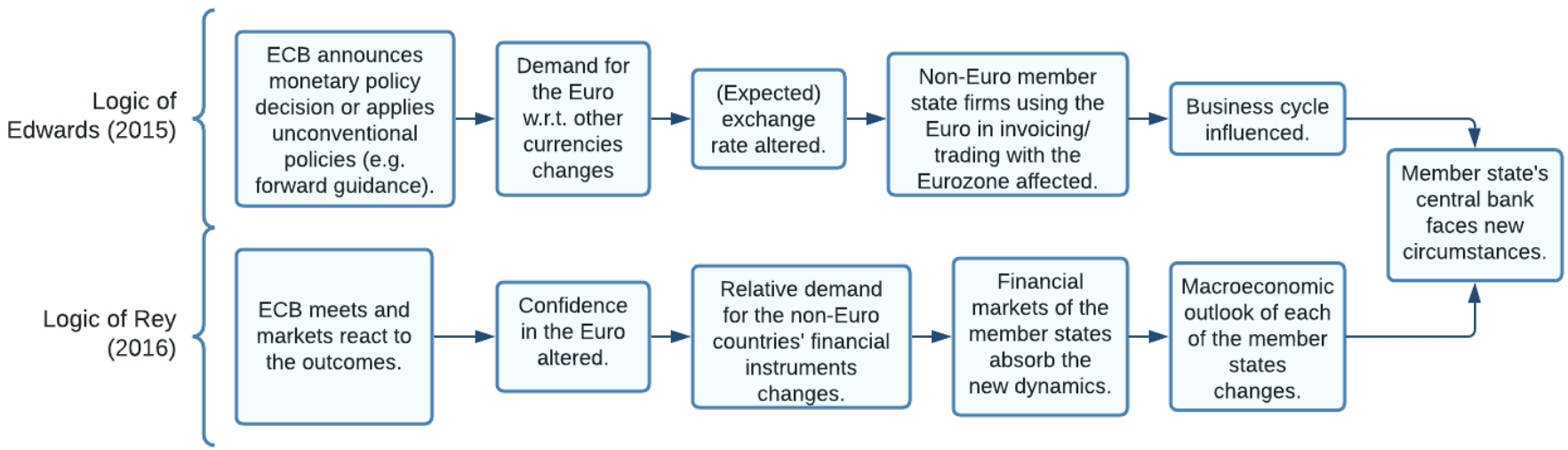
CRE Tobit & RE Logit: Results for particular transmission channels more convoluted.

Overall conclusion: Evidence against trilemma cannot be confidently rejected **but** more research (especially theoretical) needed.



Literature Inspiration

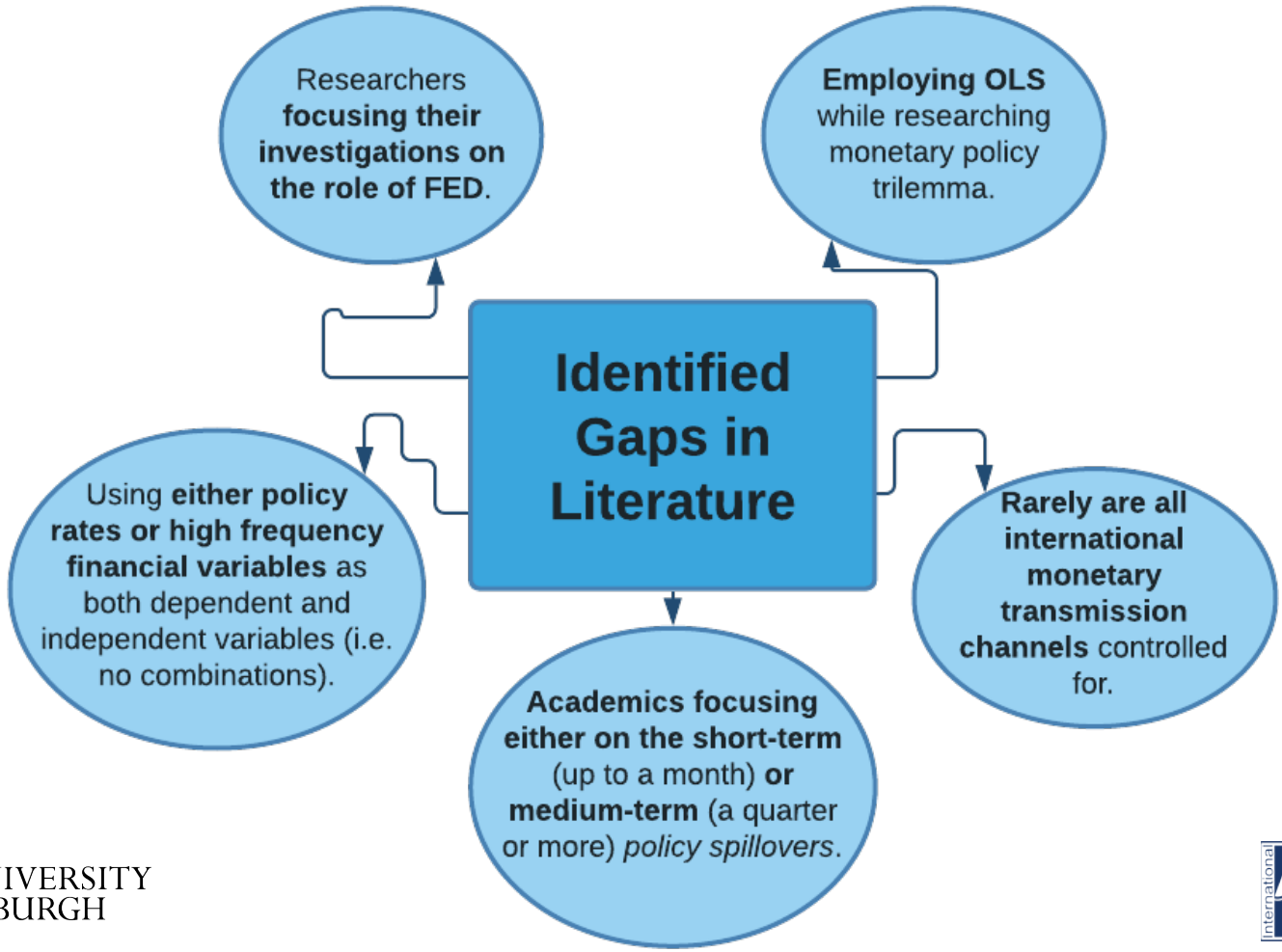
International Monetary Transmission



Arguments For & Against Monetary Policy Trilemma

Against	In Favour
1. Empirical studies a. International economics focus (Edwards, 2015; Hofmann and Takats, 2015; Han and Wei, 2018) b. Financial economics focus (Rey, 2015, 2016)	1. Historical analysis (Obstfeld et al., 2005) 2. Empirical Studies (Caceres et al., 2016) 3. Theory (Farhi and Werning, 2014)

Gaps in Literature



Data & Methodology

Data Sample: Rationale

- The sample spans **January 1999 through December 2019** (before beginning of the Covid-19 pandemic).
- Czechia, Hungary, Romania, and Poland's data were used in the sample.
- Negative & positive policy rate change dummies, (*transformed*) policy rates - **dependent variables**.
- Monetary shock variable - main **independent variable**.

Data Summary: Dependent, Independent & Control Variables (1 out of 2)

Variable	Obs.	Mean	Std. Deviation	Min.	Max.
Dependent Variables					
Country's Policy Rate	924	5.679383	4.97773	0.05	24
Transformed Policy Rate	924	2.072465	0.9393161	.0499792	3.871635
Positive Policy Rate Change Dummy	1,008	0.156746	0.3637416	0	1
Negative Policy Rate Change Dummy	1,008	0.1835317	0.387294	0	1
Independent Variable					
Monetary Shock Variable	1,008	-0.0003698	0.0325992	-0.1674253	0.1801616
Control Variables (Macroeconomic)					
Annualised Q/Q GDP Growth (%)	1,008	3.720374	4.796368	-23.71947	26.68145
Yield Curve Spread	870	0.7306552	1.795677	-9.94	3.6
Annualised HICP Inflation Growth (%)	924	3.395652	5.986133	-26.20017	47.63994
ECB Policy Rate	1,008	2.176984	1.853906	0	4.25
Financial Crisis Dummy	1,008	0.0555556	0.2291751	0	1
European Debt Crisis Dummy	1,008	0.1230159	0.3286185	0	1

Data Summary: Dependent, Independent & Control Variables (2 out of 2)

Variable	Obs.	Mean	Std. Deviation	Min.	Max.
Control Variables (Financial)					
LIBOR 3-Months Rate	1,008	2.228088	2.004068	0.22285	6.86875
London Gold Price	1,008	732.5748	368.0071	239.147	1383.51
Control Variables (Trade & Currency)					
Exchange Rate to Euro	1,008	78.60888	116.4332	1.3194	333.62
Capital Goods Flow	960	108.9552	42.08148	36.3	262.5
Export: Invoicing Share of Euro	1,008	72.27013	8.295152	50.09895	85.13074
Import: Invoicing Share of Euro	1,008	65.66831	6.317647	51.42909	75.71528

Data Transformations

- Instead of dropping the financial and *European Debt* crises values, dummy variables representing these time periods were used Constancio (2012).
- With sensitivity of *Logit* and *Tobit* to regressors with little variation, GDP Growth, Export: Invoicing Share of the Euro, and Import: Invoicing Share of the Euro were interpolated (Dagum and Cholette, 2006).
- Given the strong normality assumption of *Type I Tobit*, *Inverse Hyperbolic Sine Transformation* was applied to the original policy rate values ($r_{i,t}$), as shown below.

$$\tilde{r}_{i,t} = \ln\left(r_{i,t} + \sqrt{r_{i,t}^2 + 1}\right) \tag{1}$$

Monetary Shock Variable

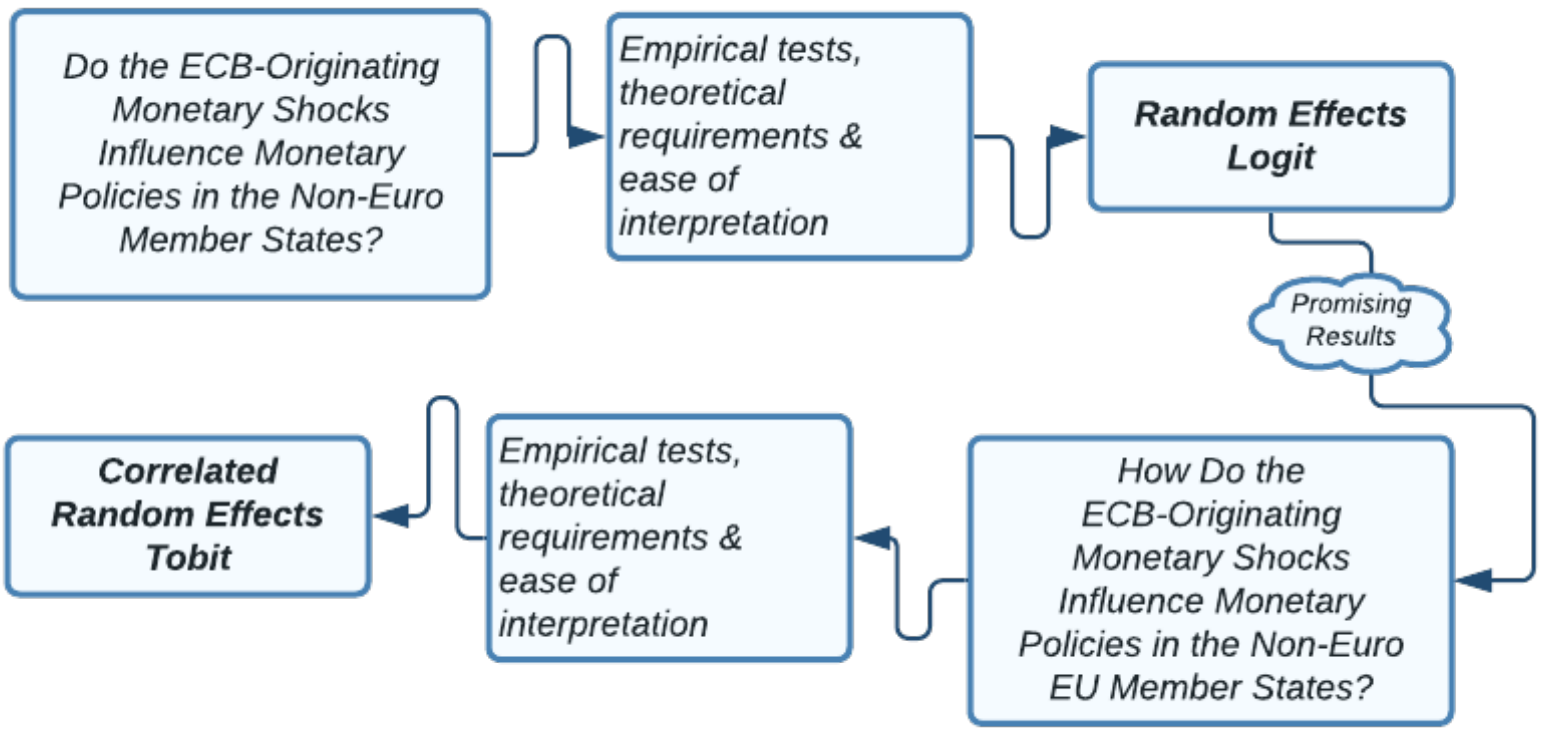
$$\overbrace{MSV_n}^{\text{Shock Variable}} = \frac{Euribor_n - Euribor_{n-1}}{Euribor_{n-1}} \times 100 \qquad (2)$$

- MSV_n values are dropped when meetings of FED, BoE or BoJ happen on the same day.
- Each month is allocated with the largest absolute value of MSV_n (or previous period's value).
- Following and expanding the methods of identifying monetary shocks applied by Nakamura and Steinsson (2018), Zhang (2018), Bruno and Shin (2015), and Gerko and Rey (2017).

Monetary Shock Variables: Advantages

1. Isolates actions of other central banks
2. Less influenced by the external variables affecting monetary policies of other member states
3. Can be positive & negative
4. Less likely serially correlated
5. Varies more than ECB policy rates

Empirical Methods Chosen



Why panel *Logit*?

- With **binary dependent variables**, linear methods permitted the dependent covariates to be outside $[0, 1]$ and assumed constant marginal effects, not feasible with the ZLB.
- **Logit was more suitable than Probit**, as the latter did not allow for FE, forced normality assumption on residuals (ruled out with the *Shapiro-Wilk* and *Jarque-Bera* tests) and was significantly more difficult to estimate for a large dimension of covariates.
- *Breusch-Pagan Lagrange Multiplier* and Wooldridge (2002)'s one-degree-of-freedom tests **ruled out using the pooled Logit model**.

Choosing RE *Logit*: Ensuring Consistency, Efficiency & Unbiasedness

Applying the *Breusch-Pagan Lagrange Multiplier* test showed that **RE Logit suited the data most.**

Problem	**Solution**
Omitted Variable Bias	Controlling for the macroeconomic, currency-related, trade, and financial factors influencing central banks' decision-making processes.
Endogeneity	Control-function method (Guevara and Ben-Akiva, 2010) → adding control functions, interaction terms, as covariates.
Heteroskedasticity of the Latent Variable Model	No latent variable model to suffer from heteroskedasticity.
Non-Stationarity	First-differencing the variables characterised by the presence of unit root (tested with the *Augmented Dickey-Fuller* test).

Designing Interaction Terms

Variable	MSV	GDP Growth	Yield Curve Spread	HICP Inflation	Exchange Rate	Capital Goods Flow	Import Share of Euro	Export Share of Euro	LIBOR	Gold Price
MSV	✗	✗	✗	✗	✓	✗	✓	✓	✓	✗
GDP Growth	✗	✗	✓	✗	✗	✓	✓	✓	✓	✗
Yield Curve Spread	✗	✓	✗	✗	✗	✗	✓	✓	✗	✗
HICP Inflation	✗	✗	✗	✗	✓	✗	✗	✗	✓	✓
Exchange Rate	✓	✗	✗	✓	✗	✓	✓	✓	✗	✗
Capital Goods Flow	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗
Import Share of Euro	✓	✓	✓	✗	✓	✗	✗	✗	✓	✗
Export Share of Euro	✓	✓	✓	✗	✓	✗	✗	✗	✓	✗
LIBOR	✗	✓	✗	✓	✗	✗	✓	✓	✗	✗
Gold Price	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗

Table: Interaction Terms Design: ✓ indicates that an interaction term of two variables was used in the RE *Logit* model, and ✗ shows that an interaction term was not used in the model.

RE *Logit* Regressions Run

$$Y_{i,t}^{+} = \mu^{+} + \pi^{+} t + \underbrace{\sum_{j=1}^{3} \beta_{t-j}^{+} MSV_{i,t-j}}_{\text{MSV Lags}} + \underbrace{\sum_{c \in C} \sum_{j=1}^{3} \gamma_{c,t-j}^{+} c_{t-j}}_{\text{Control Variables}} + \underbrace{\sum_{d \in D} \sum_{j=1}^{3} \rho_{d,t-j}^{+} d_{i,t-j}}_{\text{Interaction Terms}} + \alpha_{i}^{+} + e_{i,t}^{+} \tag{3}$$

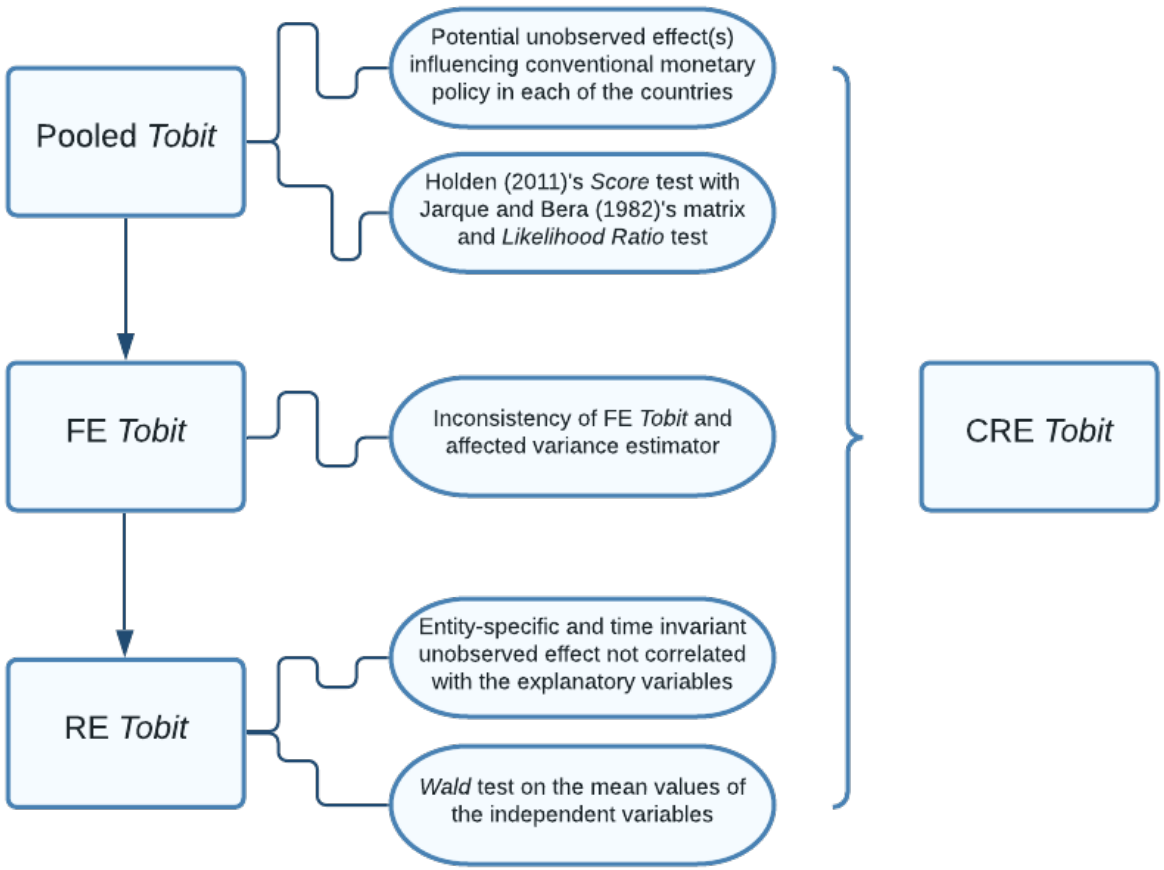
where $Y_{i,t}^{+} = \log\left[\frac{\mathbb{P}(\delta_i^{+}=1|x_i)}{1-\mathbb{P}(\delta_i^{+}=1|x_i)}\right]$. An equivalent regression was ran for the negative policy rate change model.

Why *Tobit*? Corner Solution Problem

With promising results from RE *Logit* (to be presented in later slides), the **second research question was addressed**. Here is why.

- **Linear specifications**, such as OLS or GMM, allowed for negative predicted *TPR*, ignored non-linearity between rates and covariates around ZLB and forced constant marginal effects.
- **Censored regression specifications**, such as *Type II Tobit* or *Heckman* models, were not appropriate for *TPR*s.
- **Non-linear corner solution models**, such as *Gamma (Exponential)* regression, could not be applied due to the constant variance-mean ratio requirement

Evidence in Favour of Using CRE *Tobit*



Meeting CRE *Tobit* Assumptions

1. Avoiding **heterogeneity**
2. Checking for **heteroskedasticity** of the latent variable model
3. Alleviating **endogeneity**
4. **Initial value problem**

CRE *Tobit* Regression Run

As a result, *Tobit* CRE estimating the impact was $\tilde{r}_{i,t} = \max(0, \tilde{r}^{\star}_{i,t})$, where the latent variable *Taylor* rule model was:

$$\tilde{r}^{\star}_{i,t} = \omega + \underbrace{\sum_{j=1}^{3} \beta_{t-j} MSV_{i,t-j}}_{MSV \text{ Lags}} + \underbrace{\sum_{c \in C} \sum_{j=1}^{3} \phi_{c,t-j} c_{i,t-j}}_{\text{Control Variables}} + \underbrace{\sum_{j=1}^{3} \gamma_{t-j} r_{i,t-j}}_{\text{Policy Rates Lags}} + \underbrace{\xi \overline{MSV}}_{\text{Mean } MSV} + \underbrace{\sum_{\overline{c} \in \overline{C}} \psi_{\overline{c}} \overline{c}}_{\text{Mean Controls}} + \underbrace{\sum_{c \in C} \sum_{t \in T} \eta_{c,t} c_{i,t}}_{\text{Exogenous Covariates at All Times}} + \pi t + \underbrace{\alpha_i + u_{i,t}}_{\text{Unobserved Effect \& Error}} \tag{4}$$

Results & Conclusions

What Results Show

Two conclusions of research:

- **RE Logit** models investigating if the ECB-originating monetary shocks influence monetary policies in the non-Euro EU member states: **promising results reported here & in the article.**
- **CRE Tobit** specifications studying how the ECB-originating monetary shocks influence monetary policies in the non-Euro EU member states: **convoluted results not reported here & in the article.**

RE *Logit*: Overall Results (1 out of 4)

Change of Policy Rate (→)	**Positive**	**AME**	**Negative**	**AME**
Variable (↓)	(1)	(1)	(2)	(2)
Constant	-20.10651***		8.19148**	
	(2.26462)		(3.69546)	
Lags of Monetary Shock Variable				
Monetary Shock Variable (Lag 1)	-9.12972**	-0.34936***	3.97019	0.41029
	(4.06866)	(0.09775)	(4.24633)	(0.48941)
Monetary Shock Variable (Lag 2)	5.52263	0.21133	11.85210**	1.22484
	(16.15627)	(0.58851)	(5.93857)	(0.76502)
Monetary Shock Variable (Lag 3)	19.03690***	0.72846***	-2.04149	-0.21097
	(1.80156)	(0.16473)	(9.66872)	(0.99060)
Import Share of Euro & Its Interaction Terms with MSV				
ΔImport Share of Euro (Lag 1)	-8.60558	-0.32930	12.31493	1.27267
	(15.10156)	(0.49993)	(9.00489)	(0.87312)
ΔImport Share of Euro (Lag 2)	-12.13870	-0.46450	-25.76656	-2.66281
	(23.21088)	(1.02402)	(20.12105)	(1.97840)
ΔImport Share of Euro (Lag 3)	20.09134*	0.76881	11.95594	1.23557
	(11.95302)	(0.66951)	(11.81062)	(1.18105)

Table: Robust standard errors.

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RE *Logit*: Overall Results (2 out of 4)

Change of Policy Rate (→) **Variable (↓)**	**Positive** (1)	**AME** (1)	**Negative** (2)	**AME** (2)
MSV× ΔImport (Lag 1)	-11.40981	-0.43661	8.52817	0.88133
	(25.97185)	(1.05070)	(25.75844)	(2.66841)
MSV× ΔImport (Lag 2)	45.97722*	1.75936*	22.66647	2.34243
	(25.83999)	(1.02346)	(25.36225)	(2.79572)
MSV× ΔImport (Lag 3)	66.88969	2.55959	5.95639	0.61555
	(106.29253)	(3.31553)	(31.98659)	(3.35204)
Export Share of Euro & Its Interaction Terms with MSV				
ΔExport Share of Euro (Lag 1)	19.10807	0.73119*	10.59490*	1.09491
	(16.75707)	(0.42422)	(6.00632)	(0.72981)
ΔExport Share of Euro (Lag 2)	-25.54996	-0.97769	-15.32140	-1.58337
	(33.17397)	(0.98039)	(12.59294)	(1.42303)
ΔExport Share of Euro (Lag 3)	9.82799	0.37608	5.44368	0.56257
	(18.32547)	(0.59309)	(7.28855)	(0.78003)

RE *Logit*: Overall Results (3 out of 4)

Change of Policy Rate (→)	**Positive**	**AME**	**Negative**	**AME**
Variable (↓)	(1)	(1)	(2)	(2)
MSV× ΔExport (Lag 1)	-11.67272	-0.44667	-14.30653	-1.47849
	(35.38683)	(1.39652)	(10.74879)	(1.25703)
MSV× ΔExport (Lag 2)	-100.45741**	-3.84409***	9.17181	0.94785
	(45.88326)	(1.24919)	(19.71684)	(1.99409)
MSV× ΔExport (Lag 3)	-160.19634***	-6.13006***	-36.26418***	-3.74767**
	(5.36076)	(2.03659)	(13.86044)	(1.67321)
LIBOR & Its Interaction Terms with MSV				
ΔLIBOR (Lag 1)	2.90995**	0.11135***	0.17562	0.01815
	(1.34608)	(0.03844)	(0.28192)	(0.03051)
ΔLIBOR (Lag 2)	2.27291*	0.08697	1.69937*	0.17562*
	(1.26567)	(0.05836)	(0.88493)	(0.09350)
ΔLIBOR (Lag 3)	-2.21533	-0.08477	1.56443**	0.16167***
	(1.53911)	(0.08403)	(0.61023)	(0.05854)

RE *Logit*: Overall Results (4 out of 4)

Change of Policy Rate (→) **Variable (↓)**	**Positive** (1)	**AME** (1)	**Negative** (2)	**AME** (2)
MSV× ΔLIBOR (Lag 1)	67.74893	2.59247*	-17.31760***	-1.78966***
	(54.18833)	(1.48403)	(5.55126)	(0.43766)
MSV× ΔLIBOR (Lag 2)	3.20025	0.12246	0.45112	0.04662
	(104.58876)	(4.03058)	(15.16865)	(1.56941)
MSV× ΔLIBOR (Lag 3)	14.81596	0.56695	-20.49926	-2.11846
	(82.22148)	(3.01429)	(12.81624)	(1.31059)
Summary Information				
Observations	846	846	846	846
Number of Countries	4		4	
Random Effects	YES		YES	
Robust Standard Errors	YES		YES	
Number of Hidden Regressors	72		72	
Pseudo Log-Likelihood	-122.28319		-279.97338	
$\ln(\sigma_u^2)$	0.5498352		-0.4007733	
	(0.5946776)		(0.301566)	
σ_u	1.316422		0.8184142	
	(0.3914234)		(0.1234029)	
ρ	0.3450177		0.169156	
	(0.1343855)		(0.0423828)	
Joint Wald test p-value	0.6779		0.6464	
Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1				

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RE *Logit*: A Closer Look At Monetary Shocks

Change of Policy Rate (→) **Variable (↓)**	**Positive** (1)	**AME** (1)	**Negative** (2)	**AME** (2)
Constant	-20.10651***		8.19148**	
	(2.26462)		(3.69546)	
Lags of Monetary Shock Variable				
Monetary Shock Variable (Lag 1)	-9.12972**	-0.34936***	3.97019	0.41029
	(4.06866)	(0.09775)	(4.24633)	(0.48941)
Monetary Shock Variable (Lag 2)	5.52263	0.21133	11.85210**	1.22484
	(16.15627)	(0.58851)	(5.93857)	(0.76502)
Monetary Shock Variable (Lag 3)	19.03690***	0.72846***	-2.04149	-0.21097
	(1.80156)	(0.16473)	(9.66872)	(0.99060)

- With the positive change of policy rate, notice the signs of the first and third lags.
- For the negative change in policy rate, the sign of the second *MSV* lag was in line with the predictions.

The Coefficients of MSV: A Concise Story

All else constant, **a positive monetary shock**, associated with a loss of market's confidence in the Euro, translated into:

- growing chances of positive rate shift in time (coefficients of -9.13, 5.52 and 19.04 respectively for subsequent lags), and
- eventually declining odds of the rates drop (coefficients of 3.97, 11.85 and -2.04).

In Miranda-Agrippino and Rey (2015, 2020), changes to *VIX*, a financial index, had a similar estimated impact on the key financial statistics.

In Takats and Vela (2014), the dynamics of *US Synthetic Rate* was estimated to similarly impact the Czech & Polish policy rates.

RE *Logit*: Analysing Import Share of the Euro

Change of Policy Rate (→) **Variable (↓)**	**Positive** (1)	**AME** (1)	**Negative** (2)	**AME** (2)
Import Share of Euro & Its Interaction Terms with MSV				
ΔImport Share of Euro (Lag 1)	-8.60558	-0.32930	12.31493	1.27267
	(15.10156)	(0.49993)	(9.00489)	(0.87312)
ΔImport Share of Euro (Lag 2)	-12.13870	-0.46450	-25.76656	-2.66281
	(23.21088)	(1.02402)	(20.12105)	(1.97840)
ΔImport Share of Euro (Lag 3)	20.09134*	0.76881	11.95594	1.23557
	(11.95302)	(0.66951)	(11.81062)	(1.18105)
MSV× ΔImport (Lag 1)	-11.40981	-0.43661	8.52817	0.88133
	(25.97185)	(1.05070)	(25.75844)	(2.66841)
MSV× ΔImport (Lag 2)	45.97722*	1.75936*	22.66647	2.34243
	(25.83999)	(1.02346)	(25.36225)	(2.79572)
MSV× ΔImport (Lag 3)	66.88969	2.55959	5.95639	0.61555
	(106.29253)	(3.31553)	(31.98659)	(3.35204)

RE *Logit*: Analysing Export Share of the Euro

Change of Policy Rate (→)	**Positive**	**AME**	**Negative**	**AME**
Variable (↓)	(1)	(1)	(2)	(2)
Export Share of Euro & Its Interaction Terms with MSV				
ΔExport Share of Euro (Lag 1)	19.10807	0.73119*	10.59490*	1.09491
	(16.75707)	(0.42422)	(6.00632)	(0.72981)
ΔExport Share of Euro (Lag 2)	-25.54996	-0.97769	-15.32140	-1.58337
	(33.17397)	(0.98039)	(12.59294)	(1.42303)
ΔExport Share of Euro (Lag 3)	9.82799	0.37608	5.44368	0.56257
	(18.32547)	(0.59309)	(7.28855)	(0.78003)
MSV× ΔExport (Lag 1)	-11.67272	-0.44667	-14.30653	-1.47849
	(35.38683)	(1.39652)	(10.74879)	(1.25703)
MSV× ΔExport (Lag 2)	-100.45741**	-3.84409***	9.17181	0.94785
	(45.88326)	(1.24919)	(19.71684)	(1.99409)
MSV× ΔExport (Lag 3)	-160.19634***	-6.13006***	-36.26418***	-3.74767**
	(5.36076)	(2.03659)	(13.86044)	(1.67321)

Import & Export Shares of the Euro: A Clear, Yet Imperfect Story (1 out of 3)

Consider **unit changes of MSV and either import or export share of the Euro**, *ceteris paribus*. First, consider the import-related dynamics.

- The combined change translates into an **initial drop** in estimated probability of **monetary tightening**, succeeded by **gain in odds** of such an event for next two months (all relevant coefficients add up to -29.13, 43.35 and 106.03 for lags 1 through 3)
- For the **negative policy rate change model**, analysing relevant coefficients for unit-change duo for *MSV* and import share of the Euro, one sees they total 24.81, 8.75 and 15.87 for lags 1 through 3.

With the weakness of the regression estimating the impact of ECB-originating monetary shocks on plausibility of rate dips in non-Euro EU member states, **both models are not complementary**.

Import & Export Shares of the Euro: A Clear, Yet Imperfect Story (2 out of 3)

Now, consider the export-related dynamics.

- When it comes to **policy rate hikes**, a unit increase of MSV and export fraction of the Euro in tandem leads to **negative sums of relevant coefficients**.
- There is weak (numerical) **domination of export-related coefficients** over their shock-based counterparts.
- The same shock coupled with an increasing export share of Euro invoicing decreases the likelihood of an interest rate jump.

Import & Export Shares of the Euro: A Clear, Yet Imperfect Story (3 out of 3)

- Combined dynamics of MSV with export and import shares of the Euro invoicing followed a **clear pattern for** the policy rate hikes model.
- They, however, were **convoluted** and **enjoy little statistical significance** for the specification investigating **dips in policy rates**.
- The model studying the negative changes of policy rate was characterised with **weaker results**, which echoed the discrepancy between contagion for negative and positive rates in Han and Wei (2018).

LIBOR: A Similar Picture

Change of Policy Rate (→) **Variable (↓)**	**Positive** (1)	**AME** (1)	**Negative** (2)	**AME** (2)
***LIBOR* & Its Interaction Terms with MSV**				
ΔLIBOR (Lag 1)	2.90995**	0.11135***	0.17562	0.01815
	(1.34608)	(0.03844)	(0.28192)	(0.03051)
ΔLIBOR (Lag 2)	2.27291*	0.08697	1.69937*	0.17562*
	(1.26567)	(0.05836)	(0.88493)	(0.09350)
ΔLIBOR (Lag 3)	-2.21533	-0.08477	1.56443**	0.16167***
	(1.53911)	(0.08403)	(0.61023)	(0.05854)
MSV× ΔLIBOR (Lag 1)	67.74893	2.59247*	-17.31760***	-1.78966***
	(54.18833)	(1.48403)	(5.55126)	(0.43766)
MSV× ΔLIBOR (Lag 2)	3.20025	0.12246	0.45112	0.04662
	(104.58876)	(4.03058)	(15.16865)	(1.56941)
MSV× ΔLIBOR (Lag 3)	14.81596	0.56695	-20.49926	-2.11846
	(82.22148)	(3.01429)	(12.81624)	(1.31059)

LIBOR: Repeating Pattern

Take a combination of **unit increases of both LIBOR and MSV**, all else constant.

- Policy rate hikes model was characterised with **positive sums of relevant coefficients** (61.53, 10.99 and 31.64 for lags 1 through 3).
- The negative policy rate change specification was less clear, with related coefficients accumulating to -13.17, 13.99, and -20.98 for lags 1 through 3.

This corroborated the outcomes of Hofmann and Takats (2015), who'd showed that **VIX**, another measure of global uncertainty, **was positively correlated with short-term interest rates**.

Interpreting Power of the Results: A Crisis Case Study

Who & Where → Jean-Claude Trichet & ECB Governing Council
When → November 6th 2008
What → Committing to slashing all interest rates by 50 basis points, signalling growing financial instability in the EU → MSV standing at 0.166, compared to −0.052 in previous month.

Take *Banca Națională a României* (BNR), Romania's monetary authority. According to the model:

- $\Delta P(\delta^{+}_{i,t} = 1) = -38.45$ percentage points; and
- $\Delta P(\delta^{-}_{i,t} = 1) = -9.54$ percentage points.

This resembled conflicting incentives of the EMEs central banks facing large QE programmes in the core central banks in Kuttner (2018).

Conclusions & Comparisons to Literature

1. **The impact of ECB-originating monetary shocks on estimated probabilities of the policy rate changes could not be confidently ruled out** (Takats and Vela, 2014; Miranda-Agrippino and Rey, 2015, 2020; Edwards, 2015; Rey, 2016).
2. In showing **MSV was more likely to be correlated with higher odds of a rate boost**, my study complemented inferences of Han and Wei (2018).
3. While **unable to clearly account for the relative significance of the transmission media**, one could not confidently reject the conjecture of Rey (2016) and Edwards (2015) based on *RE Logit* estimation alone.

Constructive Policy Results

Key Conclusions: More research into significance & validity of the *Mundellian* trilamma needed.

- An naive interpretation of my results, as well as those of Rey (2016) and Edwards (2015), prompts one to consider the *Mundellian* trilemma obsolete. If this is the case, Czechia, Hungary, Poland, and Romania could fix their exchange rates or **adopt the Euro**.
- **More nuanced reality**: macroprudential policies, policies between flexible & fixed exchange rates, foreign exchange interventions.
- Findings **potentially applicable** for *Mercosur*, *the West African Monetary and Economic Union* or *Gulf Cooperation Council* countries too.

Furthering & Bettering the Research

Theory	Combining different sides of macroeconomic theory: **economic unions** (Gancia et al., 2020; Broner et al., 2021), *HANK* (Kaplan et al., 2018; Alves et al., 2021)
Empirical improvements	Dataset choice & data availability (Aizenman et al., 2016; Zhang, 2018), microeconometric vs. macroeconometric methods.

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