

Transmission Lags of Monetary Policy: A Meta-Analysis

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Motivation

Milton Friedman:

“Monetary policy acts with long and variable lags.”

Transmission Lags Differ Across Countries

Table: Transmission to prices

Large developed economies		New EU members	
Economy	Lag (months)	Economy	Lag (months)
United States	42.2	Poland	18.7
Euro area	48.4	Czech Republic	14.8
Japan	51.3	Hungary	17.9
Germany	33.4	Slovakia	10.7
United Kingdom	40.4	Slovenia	17.6
France	51.3		
Italy	26.6		

Results

Main Findings

- 1 The average transmission lag is 29 months, but differs across countries.
- 2 The differences in lags are best explained by differences in financial development.
- 3 Researchers who use monthly data report faster transmission.

Project Website

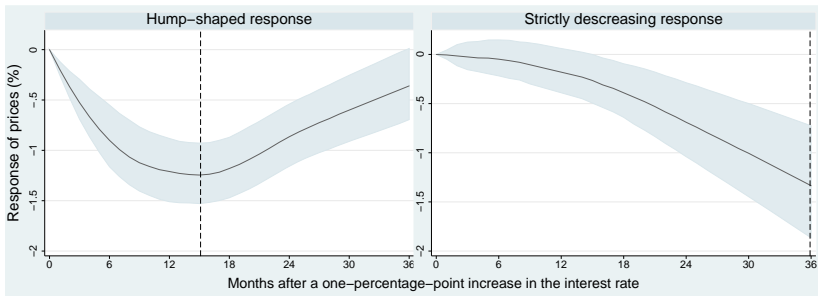
www.meta-analysis.cz/lags

Why Meta-Analysis?

- The main argument for meta-analysis is **robustness**.
- Developed in medicine to aggregate costly clinical trials.
- Meta-analysis allows for a structured discussion of the effects of study design on results.
- Interprets the results of empirical economics for policy makers – so what does the literature say?

Estimating the Lag of Monetary Policy

Results of vector autoregressions reported graphically
→ impulse response functions.



Data Properties

- We collected **published** papers using VARs to estimate the effects of a shock to the **interest rate** on the **price level**.
- 67 articles contained all necessary information.
- 198 transmission lags for 30 countries.
- 33 potential explanatory variables considered.

Explanatory Variables

Why do the reported transmission lags differ?

- ① Different characteristics of countries
 - Average growth and inflation
 - Financial development
 - Trade openness
 - Central bank independence
- ② Data and estimation characteristics
 - Variables included
 - Frequency of the data
 - Identification
- ③ Other controls (e.g. publication quality)

What Explains Differences in Transmission Lags?

Meta-regression analysis

Regress the collected lags (\widehat{lag}_{ij}) on 33 different country, method, and publication characteristics (X_{kij}):

$$\widehat{lag}_{ij} = \beta_0 + \sum_k \beta_k X_{kij} + \epsilon_{ij}.$$

Model Uncertainty

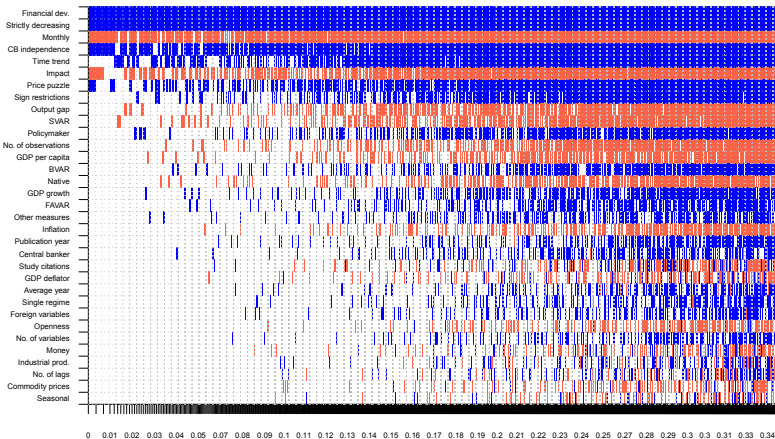
- Theory does not say which variables should be included. (There are many transmission channels.)
 - Study design may or may not systematically affect the estimated lags.
- To account for the resulting model uncertainty we use **Bayesian Model Averaging**.

Bayesian Model Averaging

- If there are m potential explanatory variables, then there are 2^m potential models.
- BMA estimates all the models and weights them according to the model fit.
- If the number of variables is very large, focus is on the important parts of the model space (MC³ algorithm).
- **Posterior Inclusion Probability** measures the importance of a potential explanatory variable in explaining the variation of the dependent variable.

Bayesian Model Averaging: Results

Model Inclusion, 5000 best models



Bayesian Model Averaging: Results

Effective variables

Masanjala & Papageorgion (2008): variables are effective if their posterior mean is larger than 1.3 posterior standard deviations.

Variable	PIP	Post Mean	Post SD	Stand. coef.
Financial Development	1.00	12.50	3.17	0.26
Strictly decreasing	1.00	26.12	1.80	0.68
Monthly	0.73	-4.18	3.04	-0.10

Robustness checks (alternatives to BMA): Tobit regression, OLS with clustered standard errors.

Interested in Meta-Analysis?

-  Stanley, T. D. & C. Doucouliagos (2012): *Meta-Regression Analysis in Economics and Business*.
Routledge, 1st. edition.
-  Havranek, T. & Z. Irsova (2011): Estimating Vertical Spillovers from FDI: Why Results Vary and What the True Effect Is.
Journal of International Economics **85(2)**: pp. 234–44.
-  Rusnak, M., T. Havranek, & R. Horvath (2012): How to Solve the Price Puzzle? A Meta-Analysis.
Journal of Money, Credit and Banking, forthcoming.

Reading list on RePEc: Google “meta-analysis in economics”