

# Report on Bachelor Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University

Student:	Daniela Žigová
Advisor:	PhDr. Jaromír Baxa, Ph.D.
Title of the thesis:	Testing long-run neutrality of money in Slovakia

## OVERALL ASSESSMENT

### Short summary

The bachelor thesis by Daniel Žigová is focused on (non-)neutrality of money in the long-run. The core of the thesis consists of an empirical analysis of this topic for Slovakia from 1996 to 2023. The thesis examines relationship between monetary aggregates M1, M2, and M3 on one side and real GDP on the other. Overall conclusion is that money is not neutral in Slovakia. Furthermore, given results of unit root test, examination of money superneutrality (which concerns growth rate of the money supply rather than its level) is possible for M1, and in this case money superneutrality is not rejected.

### Contribution

Role of money supply in the economy, which has been a bit neglected in past decades, has again gained more attention in monetary economics and central banking during recent inflation wave. In this sense, analysis of the role of money supply (especially with respect to inflation) is a relevant topic in today's discussions. Similarly, long-term impact of monetary policy on economic growth (which is traditionally thought to be non-existent) is definitely both interesting and practically relevant issue.

Nevertheless, the topic has been approached in my view from a bit unfortunate angle. My key reservation to the thesis stems from a bit outdated approach towards money creation and monetary policy, which is the most pronounced in general description of monetary policy on p. 16, but which also appears throughout whole thesis. In modern economies, **central banks neither directly control nor target money**. The amount of money in the economy is determined endogeneously by decisions of economic agents, not by central bank. At least in advanced countries (and many developing as well), central banks usually set interest rates in order to control inflation and meet their inflation targets. There is an indirect influence of the central bank on the amount of money in the economy, as those decisions of economic agents are influenced by level of interest rates, macroprudential policy and other conditions. But central bank does not target money.

Furthermore, there is only a weak relationship between money and inflation (although its actual magnitude is currently subject of renewed discussions, given mentioned recent inflationary wave), at least in low-inflation environment. And even in recent inflation wave, differences in money growth cannot satisfactorily explain inflation differentials among different countries.

Therefore, while the thesis interprets changes in money supply as changes in monetary policy itself, I consider this approach as inconsistent with actual monetary policy practice. As a result, I find it rather difficult to actually interpret results of the thesis. It still may be relevant to gain insight about relationship between money supply and economic output in the long-run, but the implications for monetary policy practice are much less straightforward than the thesis suggests and would require more discussion. On a related manner, given that the amount of money in the economy is determined endogeneously by the decisions of economic agents, I would also wander about causality between money and output – this might deserve at least some discussion as well.

### Methods

Overall, I find applied empirical methods (Fisher and Seater methodology within ARIMA framework) as correctly applied and as satisfactorily advanced for bachelor level. Some limitations of the methodology are openly discussed by the author.

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Given that the result of ADF test for differenced M1 is a bit ambiguous (p-value is 0.06, which exceeds threshold of 0.05, but it is quite close to it), it might be useful to conduct also an alternative version of unit root test at least for this variable to gain more insight. Without it, it is quite difficult to interpret the results of the analysis for M1 aggregate (as the author herself discusses).

## Literature

The thesis contains both overview of literature describing approaches of various economic schools towards relationship of money and real output, as well as overview of several empirical studies examining money neutrality for various countries. The literature review might be a bit more detailed in my opinion, but it generally covers the main areas relevant for the examined topic.

## Manuscript form

The thesis is clearly structured, well typed and easy to read.

## Overall evaluation and suggested questions for the discussion during the defense

The thesis is in general solid work, well written and with empirical methods sufficient for bachelor level. However, as described in more detail above, the thesis unfortunately suffers from a bit outdated approach towards monetary policy, which does not correspond to the way monetary policy is actually conducted in most modern economies (including Slovakia/euroarea in the examined period). On one hand, I would be a bit tolerant to this problem in the context of bachelor thesis, as even some bachelor level textbooks contain similar misconceptions, on the other hand this issue makes it quite difficult to interpret results of the analysis.

Some other minor comments:

- I am missing more detailed description of potential mechanisms, by which either money supply shock or monetary policy shock might influence output even in the long-term (i.e. what could be the mechanisms causing money non-neutrality – contrary to the conventional wisdom).
- Reserve requirements do not serve as monetary policy instrument at least in developed countries, while the thesis claims so on several places. This point is related to the outdated description of monetary policy.
- The thesis reaches the conclusion that money is not neutral in the long-term, which means that it can influence potential output. But the author then on several places claims that based on the results, monetary policy can be effective tool for economic stability. But economic stabilization is a different topic, usually thought of as stabilization of the economy close to (in this sense exogenous) potential output and related to short-term – but this has not been subject of the analysis.

Suggested questions for the defense:

- 1) What could be some theoretical explanations of either money supply or monetary policy long-term non-neutrality? I.e. by which mechanisms could one of these factors influence (potential) output in the long-run?
- 2) Given the results about relationship between money and real GDP, can the author think of some practical implications for central bank operating in inflation targeting framework with interest rate as a key monetary policy tool and with no money target or direct control of money supply?

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In my view, the thesis fulfills the requirements for a bachelor thesis at IES, Faculty of Social Sciences, Charles University. I recommend it for the defense and suggest a grade C.

The results of the Turnitin analysis do not indicate significant text similarity with other available sources.

## **SUMMARY OF POINTS AWARDED** (for details, see below):

CATEGORY	POINTS
Contribution (max. 30 points)	17
Methods (max. 30 points)	25
Literature (max. 20 points)	16
Manuscript Form (max. 20 points)	20
<b>TOTAL POINTS</b> (max. 100 points)	<b>78</b>
<b>GRADE</b> (A – B – C – D – E – F)	<b>C</b>

**NAME OF THE REFEREE:** Vojtěch Molnár

**DATE OF EVALUATION:** 27. 8. 2024

Digitally signed (27. 8. 2024):  
Vojtěch Molnár

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**Referee Signature**

