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# LAKATOS AND THE ASSUMPTION OF THE NEUTRALITY OF MONEY IN NEOCLASSICAL ECONOMICS

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**Abstract** Using Imre Lakatos' concepts concerning research programmes, it is shown that the assumption of the neutrality of money belongs to the hard core of neoclassical economics. This conclusion is based on the interrelation of the concept of the neutrality of money and that of efficient equilibria, a key notion of neoclassical economics. By showing that utility-maximizing equilibria determined by the private market do not necessarily exist if money is not assumed to be neutral, I prove that the neutrality of money is a necessary assumption for the existence of efficient equilibria. Furthermore, it will be shown that unscientific ad hoc modifications are utilized to protect this assumption, and that the research programme of neoclassical economics is hence degenerating.

## 1 Introduction

In response to the financial crisis of 2008, ignorance towards the role of money in the economy has been pointed out as a major deficit of neoclassical economics (Keen, 2013). Neoclassical theory disregards not only the effects of monetary

expansion on aggregate demand as described, for example, by Keynes (1936), but also the consequences of indebtedness on financial stability (Minsky, 1992) and the various ways of money creation (Keen, 2013; Wray, 2015). In this paper I will prove that precisely this ignorance – manifested in the assumption of the neutrality of money – is indispensable for neoclassical economics to maintain the validity of one of the major concepts the theory is built upon: efficient equilibria. I will employ Lakatos' theory on the structure and rules of research programmes to prove this point. Within this theoretical framework it will become evident that the assumption of the neutrality of money must be considered part of the hard core of neoclassical economics – meaning that refusing the assumption of the neutrality of money is equivalent to opting out of the research programme of neoclassical economics (Chalmers, 2013).

In the second part of this paper I will argue that, to protect the assumption of the neutrality of money from falsification, a differentiation between the short-run and long-run effects of a change of the quantity of money was introduced. Once again using the theoretical framework provided by Lakatos, I will show that these amendments must be considered unscientific, indicating that the neoclassical research paradigm is degenerating.

Before I develop my argument, I would like to clarify the concept of the neutrality of money as it is used in this paper. "Neutrality" in the context of money refers to the effects of a change in the quantity of money within an economy. If one assumes the neutrality of money, one expects that a change in the quantity of money in the long run only affects the price level (inflation) and has no impact on 'real' economic variables, such as (un-)employment, the wage level, growth, the real GDP, or investment (De Vroey, 1975).

## 2 Research programmes and neoclassical economics

Imre Lakatos provides a conception of the development of science in terms of research programmes, which are composed of a hard core and a protective belt. According to Lakatos' negative heuristic, scientists who work within a specific research programme should not put into question the hard core of their programme in the case of the falsification of one of their hypotheses. Instead, they are required to modify and adapt the protective belt, constituted of auxiliary theories and assumptions, to eliminate problems. Therefore, science usually develops based on the main implications given by the hard core while, according to Lakatos' positive heuristic, the main work of the scientists will consist of modifying theories within the protective belt of the research programme (Chalmers, 2013).

For the following argument I assume that neoclassical economics constitutes a research programme. Within the neoclassical research programme, the notion of equilibria is a defining feature (Arnsperger & Varoufakis, 2006). Equilibria, usually between supply and demand in various contexts, result from the autonomous decisions of individuals. The emphasis on those equilibria in neoclassical economics is rooted in the characteristics they are ascribed: Equilibria are understood as utility-maximizing and, in regard to this criteria, efficient (Dequech, 2007). I classify the notion of efficient equilibria as part of the hard core of neoclassical economics in Lakatos' model. A full justification for this classification would go beyond the scope of this paper. However, similar arguments have been made by the following authors: Arnsperger & Varoufakis, 2006; Colander, 2000; and Colander et al., 2004.

## 3 The neutrality of money and the hard core of neoclassical economics

In the following section, I demonstrate that the assumption of the neutrality of money belongs to the hard core of neoclassical economics. This becomes evident through the *incompatibility* of the absence of the assumption of the neutrality of money – which implies that money is at least potentially non-neutral – with the notion of efficient equilibria. This conclusion of incompatibility is derived from the observation that a sustainable adjustment of the quantity of money can only be achieved by the entity that issues the currency. It is usually the nation-state that performs this role.

Both the private sector and the currency-issuing entity can increase the quantity of money. The private sector, which is constituted of companies and individuals, can increase the quantity of money by taking loans (McLeay et al., 2014). However, loans are usually paid back. As soon as they are paid back, the newly created money is destroyed again and the total quantity of money returns to its old level. Therefore, the only way in which the private sector can lastingly increase the quantity of money is through a steady increase in indebtedness. Such a development is more feasible during an economic expansion than during a recession, as the ability to repay loans depends on incomes and profits. However, the level of indebtedness that does not lead to collective default is always limited. Conclusively, the private sector is not unrestrictedly able to increase the quantity of money, as debt crises confine this ability (Keen, 2017; Wray, 2015).

Contrary to the constraints of the private sector, the currency-issuing entity is able to advise its central bank to finance any of its spending if there are no

self-imposed political constraints (e.g., laws limiting the governmental authority over the central bank). Money created by the governmental sector, similarly to loans, is created in the moment an account is credited by the central bank. However, as the government has the authority over the central bank (if it does not self-impose constraints), the government is able to make use of the tool of money creation unrestrictedly. The government has no need to repay any of the money its central bank creates, and hence there is no risk of a debt crisis. Money creation by the government is neither dependent on the broader state of the economy (incomes, profits) nor is it confined by debt crises. The government is able to lastingly and unrestrictedly increase the quantity of money within an economy (Wray, 1998).

What does this insight imply for the role of the assumption of the neutrality of money in the notion of efficient equilibria? As indicated before, I would like to answer that question by analysing the implications of not assuming the neutrality of money. To develop the following argument, the assumption of the neutrality of money is not substituted by any other assumption on the role of money in the economy or society. Rather, the assumption is simply dropped. If it is not assumed that money is neutral, money is potentially non-neutral. It follows that the possibility of changes in the quantity of money influencing variables such as employment, real growth and investment is not excluded. If these variables influence total utility, which I will take as self-evident in this argumentation, it follows that a change in the quantity of money can potentially increase and decrease utility. As illustrated before, only the government can influence the quantity of money in an economy in an unrestricted way. The creation of money by the private sector is limited by the relevant economic situation. If loans systematically default, financial crises are triggered. Hence, income and profit limit the amount of money creation by the private sector that is feasible without the occurrence of financial crisis (L. R. Wray, 2015).

The acceptance of the potential non-neutrality of money therefore implies that equilibria found in the private market do not necessarily maximize utility and are therefore potentially inefficient – provided that only the government can unrestrictedly use the tool of monetary adjustment to increase utility in all economic situations. This condition is given due to the private sector's limitations on influencing the quantity of money, which do not apply to the currency-issuing entity.

As such, challenging the neutrality of money simultaneously challenges the idea of efficient equilibria. However, as the notion of efficient equilibria is assumed to belong to the hard core of neoclassical economics, Lakatos' negative heuristic postulates that scientists should refrain from challenging it. It follows that refraining from criticising efficient equilibria comprises refraining from crit-

icising the assumption of the neutrality of money, as the notion of efficient equilibria cannot be accepted without assuming the neutrality of money. Therefore, it is necessary for the idea of the neutrality of money to belong to the hard core of neoclassical economics, as it must be irrefutable. Questioning the neutrality of money would violate Lakatos' negative heuristic, and a person doing so could no longer belong to the research programme of neoclassical economics.

I therefore consciously conclude that the assumption of the neutrality of money belongs to the hard core of neoclassical economics and not to its protective belt. The task of a research programme's protective belt is to protect its hard core from falsification. This is what the assumption of the neutrality of money does for the notion of efficient equilibria. However, the assumption of the neutrality of money not only protects the idea of efficient equilibria from falsification; the assumption (even if implicitly) is necessary in order to arrive at the conclusion of efficient equilibria. The notion of efficient equilibria cannot exist without the assumption of the neutrality of money. The assumption of the neutrality of money is therefore an integral part of the hard core of neoclassical economics itself.

In the following section I will show that amendments located in the protective belt of neoclassical economics protect the assumption of the neutrality of money from falsification. However, I will argue that the modifications that were made in order to achieve this outcome are not in line with Lakatos' positive heuristic.

## 4 The neutrality of money and the protective belt of neoclassical economics

According to Lakatos' positive heuristic, scientists should modify theories and assumptions in the protective belt of their research programme in reaction to falsifications. Lakatos justifies this suggestion by pointing to scientists' inability to precisely locate the flaw responsible for the falsification, thereby reacting to criticism of Popper's falsificationism. (Chalmers, 2013). Lakatos believes that scientific progress requires some dogmatic belief in the hard core of a theory, as early refutations could hinder scientists in finding the true strength of a theory. To give theories the opportunity to present their strength, Lakatos defines a negative heuristic, which asks scientists to refrain from criticism of the hard core of their research programme. Instead, they should react by modifying the research programme's protective belt. However, these modifications should lead to testable implications that did not exist prior to the modification. For this reason, ad hoc modifications, which do not lead to new testable implications, are not desirable (Lakatos & Musgrave, 1970).

According to this definition, the following amendment to the neutrality of money in the protective belt of neoclassical economics is an ad hoc modification: *the differentiation between the effects of a change in the quantity of money in the short and in the long run*. This modification is derived by assuming that prices and wages are sticky in the short run, which leads to the implication of the non-neutrality of money in the short run. It is then assumed that prices and wages adapt over time, and in the long run reach a level that reflects the change in the quantity of money, while all "real" factors (growth, employment, investments) return to their original level. This idea is illustrated below through the example of an increase in the quantity of money and its effect on output (Duménil & Lévy, 1999) .

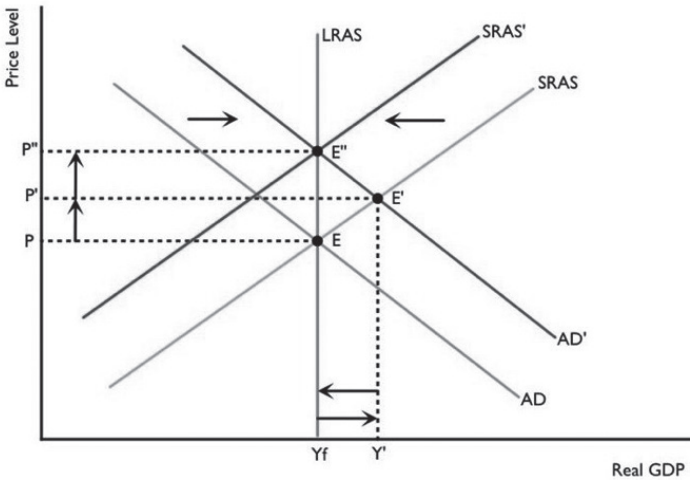


Figure 1: Effects of an increase in money supply in the short and long run on price level, aggregate demand, aggregate supply, and output in the context of the ad hoc modification of sticky prices (Peters, 2016, p. 8)

Short-run:

1. Aggregate demand increases due to increase in money supply (AD'),
2. Price level increases from P to P'
3. Output increases from Yf to Y'

Long-run:

4. Short-run aggregate supply (SRAS) returns to the level of the long run aggregate supply (LRAS)
5. Price level increases even more from P' to P''
6. Output falls back to original level Yf

The key reason for classifying this distinction as an ad hoc modification is that the concepts of short and long run are not clearly defined. Without a concrete definition of those concepts, the differentiation between the effects of a change in the quantity of money does not lead to any new testable hypotheses. Indeed, without a definition for short and long run in the context of the effects of a change of the quantity of money, the assumption of the neutrality of money becomes untestable. Regardless of whether or not changes in output, unemployment, investments, and other real variables are observed after monetary adjustments, those changes – or their absence – can be explained by pointing at the different expectations for the short and long run. Either the prediction of the neutrality of money will be observed, or one will be able to point to the variable of time, claiming that the adjustment of prices and wages is not completed yet.

In conclusion, the differentiation between the short- and long-run effects of monetary adjustments is an ad hoc modification that protects the assumption of the neutrality of money from falsification. It does not add any testable implications and, even more critically, makes the assumption of the neutrality of money unfalsifiable (Lakatos & Musgrave, 1970).

Lakatos' theory differentiates between progressive and degenerating research programmes, which allows them to be ranked – a characteristic that was missing from Kuhn's notion on paradigms and was criticised for being too relativistic. Lakatos defines progressive research programmes as internally coherent and able to make novel predictions. By contrast, degenerating research programmes fail in at least one of those tasks. As mentioned before, the assumption of the neutrality of money is modified by differentiating between short- and long-run effects. However, as those terms are not defined, the modification does not allow for any novel predictions. Leaving aside any individual assumptions regarding the time span encompassed by the "short run", this ad hoc modification even destroys the prediction of facts made possible by the unmodified assumption of the neutrality of money. The modified assumption of the neutrality of money is unable to make clear predictions concerning the effects of monetary adjustments after a specified period, and the neoclassical research paradigm is, at least in this regard, degenerating.

## 5 Conclusion

In this paper I have argued that the assumption of the neutrality of money must belong to the hard core of neoclassical economics if it is assumed that efficient equilibria do as well. This is because the absence of the assumption of the neutrality of money – the possibility that money is non-neutral – implies that monetary adjustments can influence total utility. As those adjustments can only unrestrictedly happen through currency-issuing entities, equilibria occurring through the actions of individuals are not necessarily efficient – in the sense of utility maximization – in the absence of the assumption of the neutrality of money. According to Lakatos' negative heuristic, researchers within a paradigm should refrain from criticising the hard core of their programme. Because neoclassical economists must therefore refrain from questioning the existence of efficient equilibria, the assumption of the neutrality of money must belong to the hard core of the research programme of neoclassical economics as well.

Beyond this, I have argued that the assumption of the neutrality of money is unfalsifiable due to the ad hoc modification which distinguishes between the short- and long-run effects of monetary adjustments. In accordance with Lakatos' definitions, this is an indication that the research programme of neoclassical economics is degenerating.

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