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Teaching macroeconomics through flowcharts

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ABSTRACT

Flowcharts are an invaluable tool for explaining complex mechanisms. They are used in Biology, Chemistry and many other disciplines as a teaching tool, as well as in research. However, flowcharts are hardly used in economics. This paper suggests that flowcharts could supplement graphs and algebra in the teaching of economics, especially in undergraduate courses. In order to demonstrate their effectiveness the paper presents a series of flowcharts that describe the IS-LM/AD-AS model. These flowcharts could be used in various undergraduate courses in macroeconomics, as a supplement to the standard IS-LM and AD-AS graphs.

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1. Introduction

One of the major challenges in the teaching of economics is explaining complex models in a clear and comprehensible manner. For example, even the simplest macroeconomic models, such as the IS-LM model, might be too complex for undergraduates (Romer, 2000). This paper suggests that flowcharts could help with this task.

The literature on economic education suggests many methods to improve the learning process. In particular, the use of computers is highly emphasized (Cox, 1974). Millerd and Robertson (1987) and Khandker and Wehrs (1990) suggest computer simulations, and Agarwal and Day (1998) suggest using the internet. Other tools include games (Fels, 1993), video games (Lawson and Lawson, 2010) and experiments (Wells, 1991). However, to the best of my knowledge the use of flowcharts was never explicitly suggested.

Flowcharts are a very useful tool for conveying ideas. They are used to describe different mechanisms of action in many academic disciplines, such as biology, chemistry and computer science. For example, the Krebs cycle, which describes the way food is converted to energy within the human body, is usually presented in the form of a flowchart (Berg et al., 2002). Several studies show that

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flowcharts help in the learning process (Kammann, 1975; Brooke and Duncan, 1980). Flowcharts help in visualizing mechanisms, since they outlay the steps which constitute the mechanism. Macroeconomic processes could also be explained through flowcharts. However, the use of flowcharts in the teaching of economics is very rare, with the exception of the circular flow of income (Mankiw, 2012a,b) and occasional flowcharts in macroeconomics textbooks. For example, Dornbusch et al. (2010) present only one flowchart in their book (Fig. 4.2, p. 89).

I suggest a series of flowcharts that describe the IS-LM/AD-AS model that is commonly taught in macroeconomics courses. The flowcharts are used to analyze short term dynamics in a closed economy.¹ These flowcharts could be used in various undergraduate courses in macroeconomics, as a supplement to the IS-LM and the AD-AS graphs.

Currently, macroeconomic textbooks, such as Barro (1997), Blanchard (2010), Dornbusch et al. (2010), Romer (2011) and Mankiw (2012a,b) mainly use graphs in order to explain macroeconomic models. Another tool for describing the models is algebra, which is presented mainly in graduate courses. Graphs are an invaluable tool for explaining the material. However, relying solely on graphs is problematic because of at least three reasons. Firstly, some undergraduate students might not understand graphs very well (Cohn et al., 2001). This is especially true for students lacking the necessary mathematical or analytical ability. Secondly, a graph can only present a relation between two variables. However, macroeconomics entails many complex interactions and transmission mechanisms between more than two variables. Using a series of graphs is one solution, which might be confusing. Therefore, the use of graphs might withhold information from the students and make the learning process more demanding. Finally, graphs focus on the equilibrium in the different markets, and can be very implicit regarding the dynamics which bring the equilibrium into place.

Flowcharts resolve the three issues discussed above. Firstly, contrary to graphs, flowcharts enable the presentation of many variables, hence many macroeconomic relations. Secondly, flowcharts might be more easily understood than graphs, at least at the undergraduate's level. Lastly, flowcharts are better in describing dynamic processes and the convergence toward equilibrium.

Flowcharts also have shortcomings. Firstly, like any other model, flowcharts are also a partial representation of reality. This means that the less important economic interactions are not presented within the flowchart. Secondly, flowcharts do not explicitly describe the equilibrium point, only the convergence to it.

2. A macroeconomic flowchart

This paper describes how flowcharts could be used in the teaching of economics. The paper presents a series of flowcharts describing the IS-LM/AD-AS model. We will first construct a flowchart for the IS-LM model, and then move to the IS-LM/AD-AS model in a closed economy. In order to manifest the usefulness of flowcharts under different modeling assumptions we will also present a flowchart without the LM curve, a-la Romer (2000).

The macroeconomics flowcharts are constructed in the following way. They consist of a series of boxes, connected with arrows. Every box represents a different macroeconomic variable. Boxes containing economic variables which are part of the same market have the same color.² The arrows that connect between the boxes mark the direction of the causal link between the variables. These arrows can point to each direction, as well as to two directions simultaneously. Arrows take one of two colors – green, indicating a positive correlation between the variables, or red indicating a negative correlation.³ For example, since an increase in output (Y) would cause an increase in private consumption (C), there would be a green arrow pointing from Y to C . The flowchart is built in a hierarchical manner, starting with Y and ending with Y (which is the same). This is done in order to facilitate the order of the mechanisms. In addition, the exposition of the flowchart could be done in steps, one box at a time, until the entire flowchart is being presented. Note that in reality there is no

¹ The flowcharts could also be modified to describe open economies.

² These colors are not essential to the explanation and could be omitted in a class presentation.

³ In addition, a plus or a minus sign accompanies each arrow.

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