Musings on Macro

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1 What is Economics?

Economics is the study of decisions in the presence of scarcity, prompting the necessity of tradeoffs, and the consequent emergent patterns in society.

Microeconomics concerns itself primarily with the first part of that sentence: the study of decisions by one agent, a few agents, and the interactions between them.

Macroeconomics concerns itself with the latter half of that sentence: those emergent pattens in society.

2 Why is Macroeconomics Useful?

One of the central objectives of economic inquiry to to figure out how we can do better with the stuff we currently have, "efficiency". Since we take as our reference point our current resources, we care less about absolute quantities then about relative quantities.

The central relative quantity in economics is the ratio

$$\frac{\text{output}}{\text{input}}$$

where I mean output and input in an extremely general sense. This quantity may appear in other forms, as $\frac{\text{profits}}{\text{capital}}$ = rate of return, or $\frac{\text{loan}}{\text{collateral}}$.

I am raising this point because often it is tempting for people to question the contribution of macroeconomists to policy. You can ask, why spend time on macroeconomics when we

can be encouraging people to be more hard-working, more patient, more frugal? Why not spend our energies on education? Maybe some states are doomed to poverty due to their geography. Does economics make a difference? You might be astonished at the amount of wealth that nations can gain by simply using their pre-existing resources more effectively. The practical answer to these types of doomsday questions is that there are many extremely smart people who came before us who have produced compelling evidence that nations around the world are not doomed to poverty. Even by holding current resources constant (culture, geography, institutions), a lot of advancements can be made. Or perhaps the reason we become economists comes from the simple tenet that human well-being is worth fighting for, we can probably make large improvements, and we refuse to give up or accept subpar conditions.

2.1 The Limits of Micro-Analysis

The next philosophical question to address is, why don't we run supercomputers to figure out what is best for our economy? What is the point of trying to understand the situation descriptively or write models that seem like a crude approximation of reality? There I refer you to a quote, not by an economist, but by a physicist, that talks about what defines successful scientific inquiry:

"Anyone who wants to analyze the properties of matter in a real problem might want to start by writing down the fundamental equations and then try to solve them mathematically. Although there are people who try to use such an approach, these people are the failures in this field. The real successes come to those who start from a physical point of view, people who have a rough idea where they are going and then begin by making the right kind of approximations."

- Richard Feynman

2.2 The Supertanker

Suppose we are driving a huge ship - a supertanker. We spot an iceberg tip up ahead and we want to change course. Even if we rotate our helm all the way to the right, do we expect our ship to immediately rotate 90 degrees? No, because our ship is large, it has momentum in that direction, and it's going to take a while for the paddles to provide sufficient force to propel the ship in a different direction.

So it is with economists changing the trajectory of the economy: the economy can be pictured as a giant ship. If we want to change the direction the economy is heading, say towards a recession, we can change interest rates. Does that mean it'll work right away? That

people will get their jobs back? No, because the economy is big, it had gained momentum in a negative direction, and it's going to take a while for businesses and households to adjust.

How would a smart helmsman navigate the ship? If we don't turn the wheel until the very last minute, we're probably not going to be able to avoid the danger in time. So we should look far ahead and implement corrections gradually. Similarly, economists try to predict where the economy will be months, if not years from now, before deciding what policies to implement today. That's why in macroeconomics we think about the long run. If we don't think about the long run, it will be too late by the time we actually need to implement our policies: our economy is a supertanker and it will need time to adjust to the current situation. Suppose we are a helmsman departing from New York headed for London. However, the helm is just slightly off course. If it is never corrected, the ship may end up in Spain. It will be too late to correct the helm once we can actually see the borders of Spain, because we'll be thousands of miles away from London.

2.3 Macro Models and Philosophy

Macroeconomics still exists largely in the realm of philosophy and poetry. The aesthetic appreciation of these models is definitely an acquired taste. These models contain neither the profundity of philosophy nor the elegance of poetry, nor do they often reflect the state of humankind quite as accurately.

It may be helpful to see models in macroeconomics not as "true" depictions of the world, but rather as *thought exercises*. When macroeconomists write models, they are not claiming that this is exactly how the world works, but rather engaging in a hypothetical about how an artificial world could possibly work. Why is this useful? Refer back to Section 2.1, the quote by Richard Feynman. Feynman was talking about the study of the natural world, but the human world is just as if not more complex. The art of macroeconomics lies in making the right kinds of approximations that serve a useful purpose; that is, in crafting a model can describe some aspect of the world adequately for the purposes at hand.

Identification

What do we mean by identification in macro?

A central difficulty in all of economics is causality. We need to know if X causes Y to determine what policy to implement. However, because the human world is an equilibrium outcome and there are so many variables involved, X and Y are made of components that themselves depend on each other; in other words, X and Y are endogenous. Thus, in economics we search for the part of X that is not dependent on Y (or something else), a piece

of X that can be used to infer causality. When we find that piece, we say we "identified" X.

Definition. identify: We "identify" X when we find a valid way to isolate the effect of X on a particular outcome, separate from other economic variables. In other words, we've determined a causal relationship, not just a correlation, between X and a particular outcome.

What is an "identified shock"? Suppose we want to understand the effect of a change in monetary policy on output. The problem is that monetary policy shocks are endogenous: monetary policy depends on inflation, and inflation affects output. If you measure the impact of a monetary policy shock on output, you might just end up measuring the effect of inflation on output.

To "identify" the monetary policy shock, we need to figure out the part of the monetary policy change that is a "shock"; that is, a surprise to the markets. For example, we can look at what happens to stocks in the few minutes after the monetary policy announcement and use that movement as an "exogenous shock to markets." From this, we can infer how the response of markets to a monetary policy announcement impacts output. The key idea is that there is a component of the monetary policy that the markets were not expecting, that was unanticipated and "shocked" the markets. One could say – while investors do not like surprises, economists love surprises!

The notion of identification in macroeconomics is closely related to classic econometrics. In econometrics, identification helps us answer the question: if you had ideal data, how would you estimate your parameters in the data and determine the causal effect of X on Y? In macro, we use the same idea for causal inference. Why? In both econometrics and macro, we use components or shocks respectively that are uncorrelated with the error term "exogenous".

Definition. identified shocks: An unexpected/unpredictable event that, under perfect data, can be used to figure out the effect of X on Y. Identified shocks are uncorrelated with the error terms from regressing Y on X; in other words, exogenous proxies for X. Notice that the macro view and the classic econometrics view are two sides of the same coin.

3 References

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