MACROECONOMICS II (ECO00002I)

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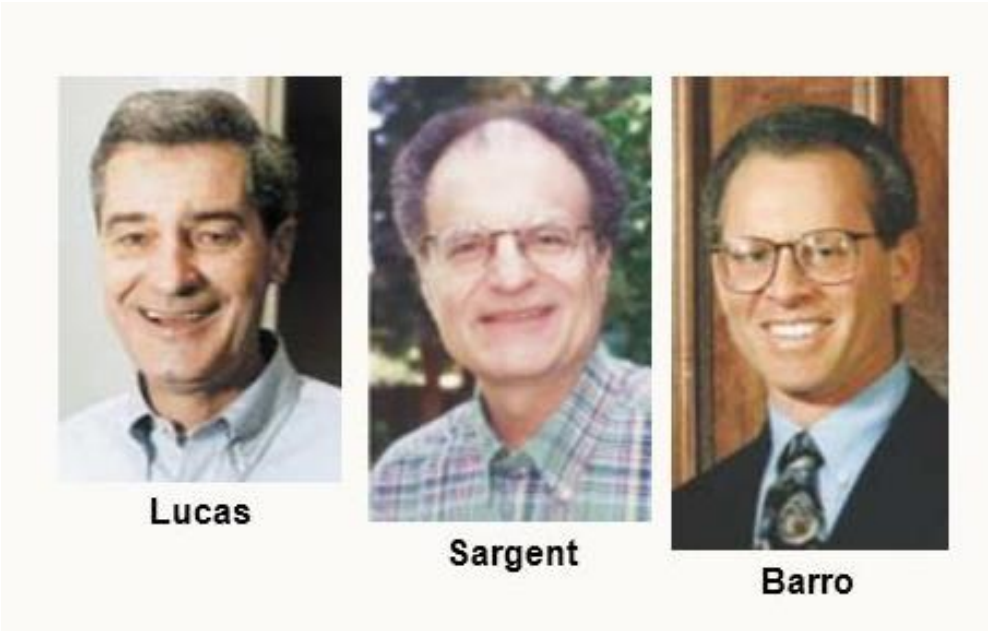
NEW CLASSICAL SCHOOL

Introduction: the New Classical School

- Main Proponents:



- Main contribution: The Rational Expectations Hypothesis
- Another contribution: The Policy Ineffectiveness Proposition

Learning Objectives

Under this topic, we will learn about:

- The Rational Expectations Hypothesis (REH) as a critique to the adaptive expectations hypothesis
- The properties and the plausibility of the REH
- The Policy Ineffectiveness Proposition (PIP) and its implications

A critique to the Adaptative Expectations Hypothesis (AEH)

- Previously, under Friedman's natural rate hypothesis, we accepted that the economy would return to the natural level/rate in the long-run, when there are adaptive expectations.

- **Critiques of AEH**:
  - Depending on the formula of adaptive expectations that the public use, and on the policy adopted by the policy-maker, the economy might deviate permanently from the natural level.

A critique to the Adaptative Expectations Hypothesis (AEH)

- Suppose the public apply the standard AEH formula from the previous lecture

  $\pi_t^e = (1 - \lambda)(\pi_{t-1} + \lambda\pi_{t-2} + \lambda^2\, \pi_{t-3} + \ldots)$

  not to the inflation rate, but instead to the price-level:

  $p_t^e = (1 - \lambda)(p_{t-1} + \lambda p_{t-2} + \lambda^2\, p_{t-3} + \ldots)$

- Then, notice that the PC equation can be expressed as

  $$y_t - y_n = \theta(\pi_t - \pi_t^e)$$
  $$= y_n + \theta[(p_t - p_{t-1}) - (p_t^e - p_{t-1})]$$
  $$= y_n + \theta(p_t - p_t^e)$$

- Thus, to have an economy where $y_t > y_n$ permanently, the government needs to have $p_t > p_t^e$.

A critique to the Adaptative Expectations Hypothesis (AEH)

- Suppose then the policy-maker uses monetary policy to create a constant positive rate of inflation.
- In this case, since prices are always rising, we know $p_t > p_{t-1} > p_{t-2} > \ldots$
- In addition, as the formula for p_t^e demonstrates, p_t^e is a weighted average of all past price levels ($p_{t-1}, p_{t-2}, \ldots$).
- As a result, we know that $p_t > p_t^e$.
- It follows that $y_t > y_n$ permanently, using the PC: $y_t - y_n = \theta(p_t - p_t^e)$.

A critique to the Adaptative Expectations Hypothesis (AEH)

- This implies the policy-maker is exploiting the way in which the public form their expectations.
- However, it doesn't make sense for the public to keep forecasting p_t^e this way in a climate of permanently positive inflation.
- In such a climate, it would be more logical for the public to apply the AEH formula to past inflation rates.
- In this case, the policy-maker could achieve $y_t > y_n$ by choosing permanently accelerating inflation rates.
- This demonstrates the main critique of AEH: it is too mechanical and treats the public as being gullible.

The Rational Expectations Hypothesis (REH)

- Rational expectations hypothesis (REH) assumes that individuals make decisions based on all the information available to them and learn from past trends.
- It suggests that economic agents can be wrong sometimes, but on average, they will be correct.

Source: Rational Expectations - Definition, Theory, and Practice

The Rational Expectations Hypothesis (REH)

- In other words, REH treats the public as rational in the way their form their expectations.
- One way to do this:
  - Assume the agents in a macroeconomic model make the same forecasts about the future as the economists who are constructing the model.
  - I.e., when forming their expectations, the agents in a model are not worse than the economists constructing the model.

The Rational Expectations Hypothesis (REH)

- Keep in mind that we assume that the economy is hit by random shocks, making it generally impossible to have perfectly accurate predictions.

- The best prediction we can make is to calculate “the mathematical expectation” of the variable we are trying to forecast using the model we have.

- The REH assumption is then that agents’ subjective expectations is equal to the true mathematical expectation given by the model:

$$\pi_t^e = E_{t-1}(\pi_t)$$

where $E_{t-1}(\dots)$ denotes the mathematical expectation conditional on the information available at t-1

Properties of Rational Expectations

- Even though the public makes errors, they do not make "systematic errors", i.e. π_t - $E_{t-1}(\pi_t)$ is serially uncorrelated.
- π_t - $E_{t-1}(\pi_t)$ is also serially uncorrelated with the lagged values of any other variables.
- If this was not true, the public could improve on their forecasts by using publicly available information.

How plausible is the assumption of RE?

- Can the public be expected to be as good at forecasting as economists who have much more technical knowledge?
- Alternatively, the public doesn't need to do the forecasting themselves, but can read the predictions of the professionals.
- Neither the AEH nor the REH are fully satisfactory.
- Economists mostly use REH, especially when they are trying to make policy recommendations.
- However, when we are trying to understand the effects of past historical events, which are not part of a regularly repeated pattern, it is implausible to assume agents had RE.

Alternatives to AE and RE

- Alternatives to the assumptions of the AEH or REH involve modelling the public as learning about their environment.
- Such models are technically difficult to work with.
- In addition, they do not have a commonly accepted, standard version.
- Hence, they have not so far found wide acceptance within macroeconomics.

The Policy Ineffectiveness Proposition (PIP)

- The policy-ineffectiveness proposition (PIP) is a theory proposed in 1975 by the New Classical School based upon the theory of rational expectations.

- It advocates that monetary policy cannot systematically change the levels of output and employment in an economy.

The Policy Ineffectiveness Proposition (PIP)

To demonstrate if PIP holds, let's consider the following macroeconomic model (following Hoover, The New Classical Macroeconomics, Ch. 4 pp. 65-73):

$$y_t = y_n + \alpha[p_t - E_{t-1}(p_t)] + \varepsilon_t \quad \text{AS function}$$
$$p_t = m_t - y_t + u_t \quad \text{AD function}$$
$$m_t = \lambda + m_{t-1} + e_t \quad \text{monetary policy rule}$$

where $E_{t-1}(\varepsilon_t) = E_{t-1}(u_t) = E_{t-1}(e_t) = 0$ and $(\varepsilon_t, u_t, e_t)$ are "white noise".

The question: Can monetary policy be used to affect the mean or the variance of output?

The Policy Ineffectiveness Proposition (PIP)

1. Solving for the mean of output, $E_{t-1}(y_t)$:

- Take expectations as of period *t*-1 through the AS function, $y_t = y_n + \alpha[p_t - E_{t-1}(p_t)] + \varepsilon_t$:

$$E_{t-1}(y_t) = y_n + \alpha\left[E_{t-1}(p_t) - E_{t-1}\left(E_{t-1}(p_t)\right)\right] + E_{t-1}(\varepsilon_t)$$
$$= y_n$$

- As $E_{t-1}(y_t) = y_n$, this implies monetary policy cannot affect the mean of output under REs.

The Policy Ineffectiveness Proposition (PIP)

2. Solving for the complete distribution of output, y_t:

- Substitute the monetary policy rule, $m_t = \lambda + m_{t-1} + e_t$ into the AD function, $p_t = m_t - y_t + u_t$:

  $$p_t = [\lambda + m_{t-1} + e_t] - y_t + u_t$$

- Take expectations as of period *t*-1 through this:

  $$E_{t-1}(p_t) = \lambda + m_{t-1} - y_n$$

- Subtract $E_{t-1}(p_t)$ from the previous equation for p_t :

  $$p_t - E_{t-1}(p_t) \quad = \quad y_n - y_t + e_t + u_t$$

- Now substitute the equation for $p_t - E_{t-1}(p_t)$ back into the AS function, $y_t = y_n + \alpha[p_t - E_{t-1}(p_t)] + \varepsilon_t$:

  $$y_t = y_n + \alpha[y_n - y_t + e_t + u_t] + \varepsilon_t$$

The Policy Ineffectiveness Proposition (PIP)

- Gathering terms in y_t and re-arranging then gives:

$$y_t = y_n + \frac{1}{(1+\alpha)}\left[\alpha(e_t + u_t) + \varepsilon_t\right]$$

- The second right hand side of the term gives us the random component of output.
- We can observe that the policy parameter, λ from $m_t = \lambda + m_{t-1} + e_t$ does not affect this random component.
- This implies λ does not affect the variance of output and hence, monetary policy cannot be used to stabilise output.

The Policy Ineffectiveness Proposition (PIP)

- What is the intuition behind this algebraic result?
  - Remember, deviations of output from its natural level occur because of expectational errors: when actual prices are higher or lower than expected prices.
  - If people have REs, they use their knowledge of the monetary policy rule to form their expectations of future prices.
  - Hence, no matter what rate of growth of the money supply the policy-maker chooses, they cannot trick economic agents into systematically misforecasting prices, unlike the case with AEs.
  - I.e., since there are no systematic expectational errors, there is no systematic effect on output.

The Policy Ineffectiveness Proposition (PIP)

- The New Classical School's policy ineffectiveness proposition can be considered to be an extreme version of Monetarism.
- Friedman believed monetary policy couldn't affect real variables in the long-run but accepted that it could affect them in the short-run.
- The New Classicals argue that monetary policy is ineffective even in the short-run.

The Policy Ineffectiveness Proposition (PIP)

- The only way for monetary policy to affect real variables in the short run would be if policy-makers deliberately randomised policy, so that the error term, e_t in the monetary policy rule would have a larger variance.

- Using the solution $y_t = y_n + \frac{1}{(1+\alpha)}\,[\alpha(e_t + u_t) + \varepsilon_t]$, we can see that this would imply a larger variance of output too.

- However, this is not of much use to policy-makers, since policy-makers would not want to deliberately use monetary policy randomly.

The Policy Ineffectiveness Proposition (PIP)

- Implications:
  - Theoretically, PIP represents a significant challenge to the prevailing Keynesianism of the 1970s, as Keynesians argued aggregate demand management can be effective in stabilising the economy.
  - Practically, if the New Classical view was correct, it implies that inflation can be reduced without even a temporary cost of higher unemployment and recession.
  - This view influenced the disinflationary policies associated with Ronald Reagan in the US and Margaret Thatcher in the UK in 1980s.

Source: Thatcher, Reagan relationship altered history

Escapes from the PIP

- Two main ways of “escaping” the PIP have been proposed by macroeconomists:
  - The policy-maker may have an informational advantage, i.e. they may be able to observe shocks before the public does.
  - Prices and wages may not be flexible as assumed in the AS function.

Escapes from the PIP

Modelling the informational advantage of the policy-maker:

- In this case, we can assume that the monetary policy rule is now given by
  $m_t = \lambda + m_{t-1} + e_t - \boldsymbol{u_t}$
- Recall, u_t represents the shock to AD ($p_t = m_t - y_t + u_t$).
- Hence, the updated monetary policy rule above implies the policy-maker would reduce the money supply whenever there is a positive shock to AD and vice versa.

Escapes from the PIP

- Solving for the complete distribution of output, y_t as we did before, using the updated monetary policy rule, we obtain:

  $$y_t = y_n + \frac{1}{(1+\alpha)}\,[\alpha e_t + \varepsilon_t]$$

- Let's compare this with the previous equation for y_t: $y_t = y_n + \frac{1}{(1+\alpha)}\,[\alpha(e_t + u_t) + \varepsilon_t]$

- The mean of output is still **not** affected by monetary policy.

- However, as the random shock term u_t is now eliminated from the equation for y_t, this shows that monetary policy can stabilise output by lowering its variance around y_n.

References

- Hoover, K., *The New Classical Economics: A Sceptical Inquiry* (1988, Blackwell), Ch. 4 “The Limits of Monetary Policy: Macroeconomic Models” [Reading advice: **Essential**].

- Froyen, R., *Macroeconomics: Theories and Policies* (2013, 10th edition, Pearson), Ch. 11 “New Classical Economics” [Reading advice: **Recommended**].

- Snowdon, B. and Vane, H., *Modern Macroeconomics: Its Origins, Development and Current State* (2005, Edward Elgar), Ch. 5 “The New Classical School” [Reading advice: **Recommended**].