Question: Taking as given the role of expectations $\pi^e$ in AS (Lecture 6), what difference does it make if expectations are rational: $Expected (\pi) = \pi^e$?

Answer: It may mean that monetary policy cannot have a systematic effect on GDP or other real variables.
An example of predictable inflation:

The Mexican sexenio

From 1976 through 1994, inflation shot up every 6th year (presidential election years) and the peso would devalue.
The Mexican sexenio, continued

Example of rational expectations: investors came to anticipate inflation & devaluation after elections, and so would pull out ahead of time.

Figure 10: Mexico: Ratio of cumulated net capital inflows over the last four quarters to cumulated GDP over the last four quarters. Shaded areas describe periods of sudden stops.

OVERVIEW OF AGGREGATE SUPPLY (continued)

- Wage contract: \( \bar{W} = \omega P^e \).

- Lucas supply relationship:
  \[
  \frac{Y}{\bar{Y}} = (\frac{P}{P^e})^\sigma
  \]

  or in logs,
  \[
  y - \bar{y} = \sigma (\pi - \pi^e) = \sigma \varepsilon,
  \]
  where \( \pi \equiv p - p_{-1} \)
  and \( \pi^e \equiv p^e - p_{-1} \).

Rational expectations says \( \varepsilon \) is unforecastable: \( \text{Expectation}_t(\varepsilon_{t+1}) = 0 \).

\[
\Rightarrow \text{Monetary policy cannot have a systematic effect on } y - \bar{y}.
\]
If the public rationally expects stimulus each election year, the government then has to deliver the inflation just to keep \( Y \) from falling below \( \bar{Y} \).

\[
\pi = \sigma (\pi - \pi^e)
\]

\[
y - \bar{y} = \sigma (\pi - \pi^e)
\]

When \( \pi^e = 0 \):

\[
y - \bar{y} = \sigma \pi
\]
Intellectual History of the Increasing Ineffectiveness of Monetary Policy at Stabilizing Output

\[ y - \bar{y} = \sigma (\pi - \pi^e), \]

Monetary expansion can raise \( Y \)?

A.S. --

Phillips curve (1958) --

Friedman & Phelps (1968)

Natural Rate Hypothesis. --

Lucas, Sargent, Barro (1972-78)

Rational Expectations --

Kydland-Prescott (1977) & Barro-


E.g., Bruno-Easterly (1998) &

Dornbusch-Fischer (1993) --

at the cost of higher \( P \).

at the cost of higher inflation, \( \pi \).

at the cost of ever-accelerating \( \pi \) (because \( \pi^e \) adjusts over time to \( \pi \)).

only randomly (because \( \pi - \pi^e \) must be random).

and, worse yet: monetary discretion => inflationary bias.

High \( \pi (> 40\%) \) hurts growth in the LR. (Table 2)
Inflation above a threshold ≈ 40% tends to have a negative effect on growth.

Table 2
Growth before and after inflation crises of 40% and above, 1961–1994a (t-statistics in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>No. of annual observations</th>
<th>Inflation rate (%)(^b)</th>
<th>Per capita growth(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before first inflation crises</td>
<td>518</td>
<td>11% (24.46)</td>
<td>1.3% (4.91)</td>
</tr>
<tr>
<td>During inflation crises</td>
<td>269</td>
<td>151% (17.22)</td>
<td>−1.1% (−3.23)</td>
</tr>
<tr>
<td>After inflation crises</td>
<td>176</td>
<td>17% (24.11)</td>
<td>2.2% (8.18)</td>
</tr>
<tr>
<td>t-stat for (H_0): equality of means during−before</td>
<td></td>
<td>15.17</td>
<td>−5.57</td>
</tr>
<tr>
<td>t-stat for (H_0): equality of means after−during</td>
<td></td>
<td>−14.12</td>
<td>7.64</td>
</tr>
<tr>
<td>t-stat for (H_0): equality of means after−before</td>
<td></td>
<td>6.70</td>
<td>2.42</td>
</tr>
</tbody>
</table>

\(^a\)There were 41 high inflation crises in 31 countries, with a median crisis length of 6 years

\(^b\)GDP per capita growth from World Bank Economic and Social Database (BESD), inflation from International Financial Statistics (CPI December over December); averages are geometric averages.

Inflation is usually > 0 and was a chronic problem during 1950-2000.

Source: Carmen Reinhart & Ken Rogoff, 2011, *This Time is Different: A Panoramic View of Eight Centuries of Financial Crises.*
The highest inflation rates are now in Venezuela & Argentina.


¹ For Argentina, projected annual inflation is computed using cumulative inflation through July and assuming monthly inflation for the rest of the year will equal the average of the last three months.
If monetary expansion can’t reduce unemployment in the long run, why is inflation so common?

Four possible explanations:

- Governments *think* expansion can reduce unemployment even in the long run.

- They give low weight to price stability, or have high discount rates (e.g., political business cycle).

- Plans to set non-inflationary monetary policy are perceived by the public to be *time-inconsistent* (Lecture 8).

- Governments want *seigniorage*, to pay for spending that is not financed by taxes or borrowing (Lecture 9).
### Appendix: Targets & Instruments of Policymaking

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>Inflation</th>
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<tbody>
<tr>
<td></td>
<td>Growth &amp; Unemployment</td>
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<tr>
<td></td>
<td>TB, Balance of payments</td>
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</table>

<table>
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<tr>
<th>INSTRUMENTS</th>
<th>Overnight interest rate</th>
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<td>Open market operations</td>
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<td></td>
<td>Reserve requirements</td>
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<td>Foreign exchange intervention</td>
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<th>INTERMEDIATE TARGETS</th>
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<tbody>
<tr>
<td></td>
<td>Exchange rate</td>
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<tr>
<td></td>
<td>Core CPI</td>
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<tr>
<td></td>
<td>Nominal GDP</td>
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</table>

<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>Stock market, Commodity prices,</th>
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<tbody>
<tr>
<td></td>
<td>Consumer confidence, PMI ...</td>
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