The Optimal Rate of Inflation

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## Inflation Targets Around the Industrial World

<table>
<thead>
<tr>
<th>Country</th>
<th>Inflation Target (percent per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand</td>
<td>1-3</td>
</tr>
<tr>
<td>Canada</td>
<td>1-3</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2</td>
</tr>
<tr>
<td>Australia</td>
<td>2-3</td>
</tr>
<tr>
<td>Sweden</td>
<td>2 ±1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>Iceland</td>
<td>2.5</td>
</tr>
<tr>
<td>Norway</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Motivating Question

Are observed magnitudes of inflation targets (2 percent or higher) consistent with the optimal rate of inflation predicted by leading theories of monetary non-neutrality?
Two Key Sources of Monetary Nonneutrality

<table>
<thead>
<tr>
<th>Source</th>
<th>Optimal Inflation Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand for Money</td>
<td>$-r$</td>
</tr>
<tr>
<td>Sticky Prices</td>
<td>0</td>
</tr>
</tbody>
</table>
Deviations from the Friedman Rule within the Money-Demand Model

- **Distortionary Taxation:** Friedman rule still optimal (contrary to Phelps’ 1973 conjecture)

- **Untaxed Income:** Small deviations from Friedman rule.
  - Untaxed Profits
  - Tax Evasion
A Foreign Demand for Domestic Money

- **Motivating Fact:** More than 50% of US currency circulates abroad

- **Ramsey Optimal Inflation Target with a Foreign Demand for Domestic Currency**

<table>
<thead>
<tr>
<th></th>
<th>$\frac{M_f}{M_f + M_d}$</th>
<th>$\frac{M_f + M_d}{P_c}$</th>
<th>Optimal Inflation Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Foreign Demand</td>
<td>0</td>
<td>0.27</td>
<td>-3.9%</td>
</tr>
<tr>
<td>Foreign Demand</td>
<td>0.22</td>
<td>0.26</td>
<td>+2.1%</td>
</tr>
</tbody>
</table>

- **Caveat** This argument does not apply to countries lacking a foreign demand for their currency.
Friedman-Rule Versus Price-Stability Tradeoff
(or Money Demand Meets Sticky Prices)
Friedman-Rule Versus Price-Stability Tradeoff with Optimal Distortionary Taxation

Phelps’ conjecture resurrected

![Graph showing the relationship between the degree of price stickiness and the optimal inflation target.](image-url)
Does the Zero Bound Provide a Rationale for Positive Inflation Targets?

- Strategy: Build medium-scale macroeconomic model estimated on U.S. data.

- Compute Ramsey optimal monetary policy.

- Finding: $\text{mean}(\pi) = -0.4\%$; $\text{mean}(R) = 4.4\%$; $\text{std}(R) = 0.9$. 
  $\Rightarrow R$ must fall 4 stds to hit zero bound

- Under optimal policy hitting zero bound is unlikely.
Downward Nominal Rigidity

The Issue: If nominal prices are downwardly rigid, then any change in relative prices requires an increase in the nominal price level. (Structural inflationary pressure. Olivera, OEP, 1964.)

The Question: What is the optimal structural rate of inflation?

The model:— Neo-Keynesian framework with price and wage rigidity, no capital and no demand for money. Wage adjustment costs are asymmetric. (Kim and Ruge Murcia, 2009).

Answer: The optimal structural rate of inflation is 0.35 percent per year. Not large enough to explain observed inflation targets of 2 percent.
Quality Bias

Firms produce $c_{it} = z_tF(h_{it})$ and sell it for $P_{it}$ dollars.

Households care about $a_t \equiv \left[ \int_0^1 (x_{it} c_{it})^{1-1/\eta} di \right]^{1/(1-1/\eta)}$ and demand $c_{it} = \left( \frac{\bar{P}_{it}}{\bar{P}_t} \right)^{1-\eta} \frac{a_t}{x_{it}}$.

The exogenous variable $x_{it} = (1+\kappa)x_{it-1}$ captures quality improvement.

$\bar{P}_{it} \equiv \frac{P_{it}}{x_{it}}$ is the quality-adjusted (or hedonic) price of $c_{it}$.

$\bar{P}_t$ is an index of quality-adjusted (or hedonic) prices.
The parameter $\kappa > 0$ denotes the rate of quality improvement.
Conclusions

The theories reviewed in this chapter suggest that

- there is little theoretical support for inflation targets as high as 2% per year.

- the optimal inflation target is around zero.