Government Debt and Capital Accumulation in an Era of Low Interest Rates

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The Incredible Shrinking Interest Rate
Steady-state interest rate in the Solow Model

\[ r = \alpha \left( \frac{n + g + \delta}{s} \right) - \delta \]
Higher saving reduces the interest rate

\[
\frac{\partial r}{\partial s} = - \alpha \left( \frac{n + g + \delta}{s^2} \right) \approx -\frac{1}{3} \left( \frac{0.01 + 0.02 + 0.05}{0.24^2} \right) = 0.46
\]
The Rising World Saving Rate
Lower growth reduces the interest rate

\[
\frac{\partial r}{\partial (n + g)} = \frac{\alpha}{s} \approx \frac{1/3}{0.24} = 1.39
\]
The Declining World Growth Rate
The Diamond Model

• \( r < n + g \) is possible.

• It implies that we have too much capital.

• Government debt can solve the problem.
Back to the Interest Rate

\[ r = \alpha \left( \frac{n + g + \delta}{s} \right) - \delta \approx \left( \frac{1}{3} \right) \left( \frac{.01 + .02 + .05}{.24} \right) - .05 = .061 \]
Adding risk

• Don’t compare the safe rate on bonds with the risky growth rate.

• ASMZ: We have not overaccumulated capital.

• Rolling over debt is a gamble.

• Intergenerational risk sharing.
Adding market power

\[ P = \mu MC \]

\[ MC = \frac{(r + \delta)P}{f'(k)} \]

\[ r = \frac{f'(k)}{\mu} - \delta \]
The Solow model with market power

\[ r = \alpha \left( \frac{n + g + \delta}{\mu s} \right) - \delta \]
Markups may be rising

A higher markup lowers the interest rate

\[
\frac{\partial r}{\partial \mu} = -\alpha \left( \frac{n + g + \delta}{\mu^2 s} \right) \approx -\left( \frac{1}{3} \right) \left( \frac{.01 + .02 + .05}{1.2^2(.24)} \right) = .08
\]
Four Takeaways

• The decline in real interest rates seems explicable.

• The government can *probably* grow out of its debts.

• The possible (but unlikely) Ponzi failure is a dire outcome.

• Even when greater government debt is a budgetary free lunch, crowding out capital can still reduce welfare.