Business Cycles

- Exercise 8 -

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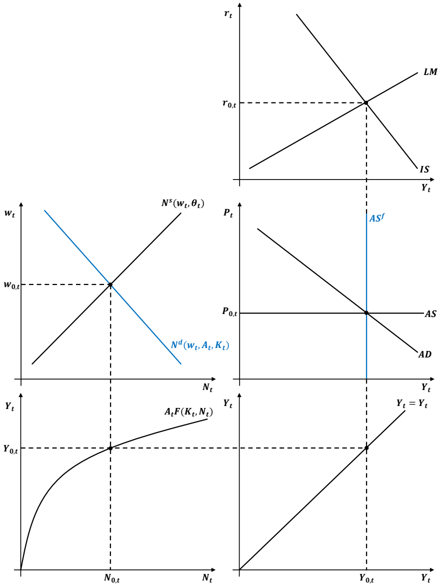
Question:
Graphically analyze the effects of an increase in θ_t in the Neoclassical and sticky price model. When possible, compare the magnitudes of the changes of each endogenous variable.

Neoclassical model

1. Increase in θ



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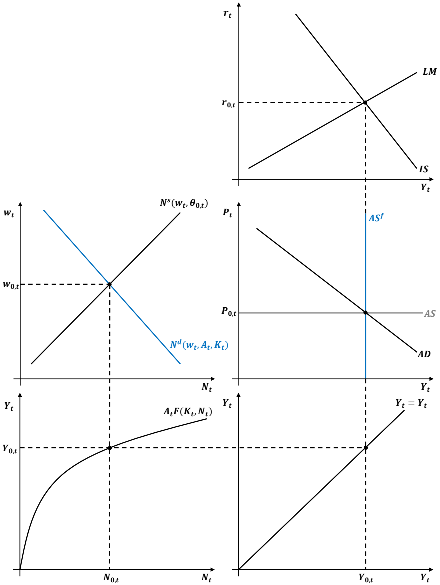
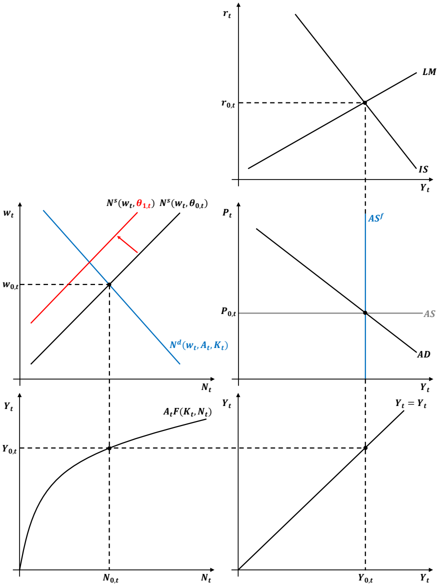


Neoclassical model



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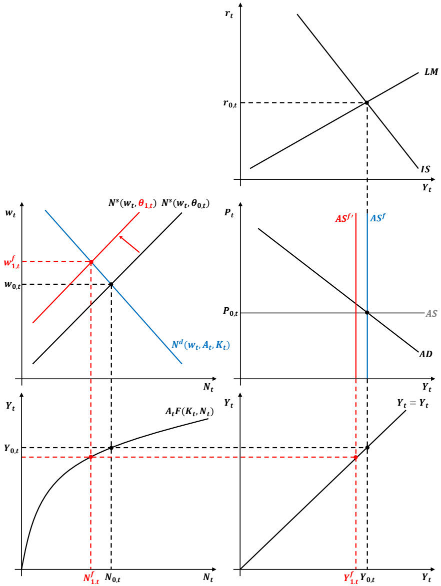

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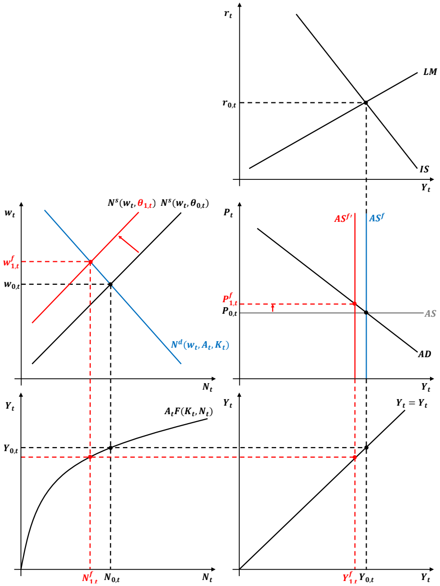

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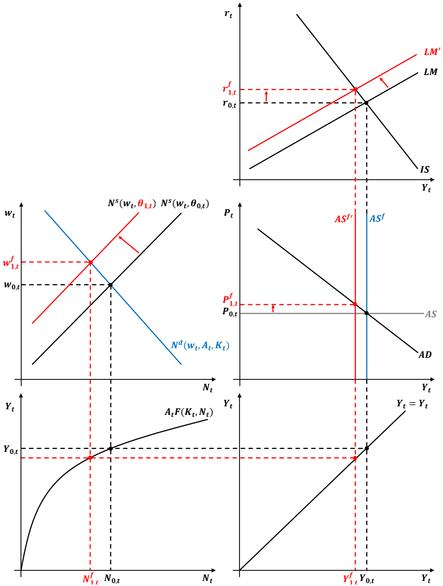
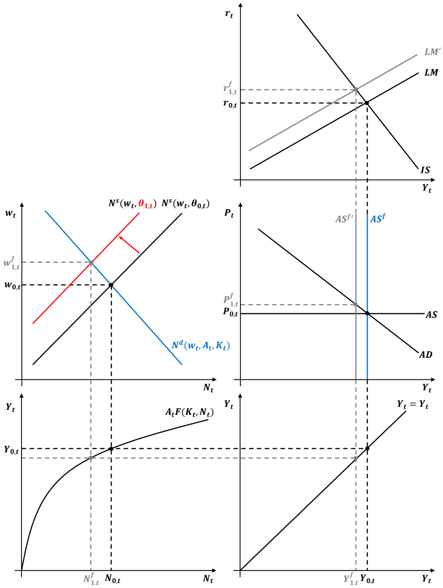


Sticky price model

1. Increase in θ



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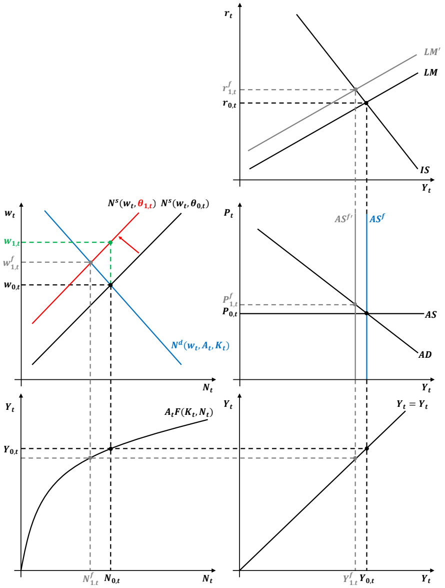
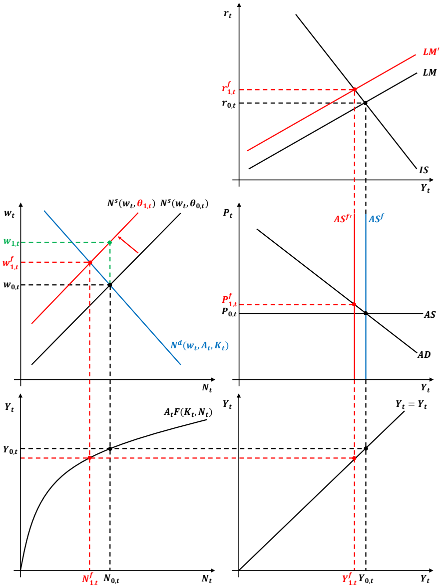


Sticky price model

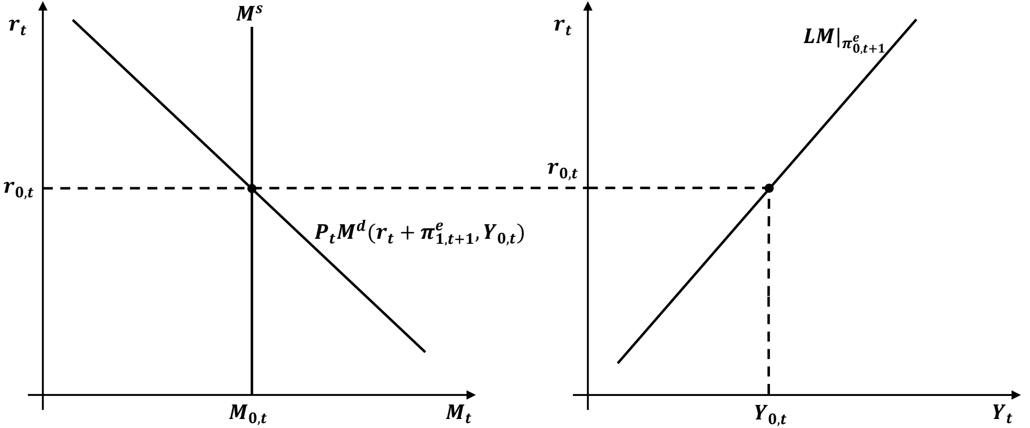


	Neoclassical	Sticky prices
$\mathbf{Y_t}$:	$Y_t^f \downarrow$	Y_t fixed
$\mathbf{N_t}$:	$N_t^f \downarrow$	N_t fixed
$\mathbf{w_t}$:	$w_t^f \uparrow$	$w_t \uparrow$ even more
$\mathbf{r_t}$:	$r_t^f \uparrow$	r_t fixed
$\mathbf{P_t}$:	$P_t^f \uparrow$	P_t fixed

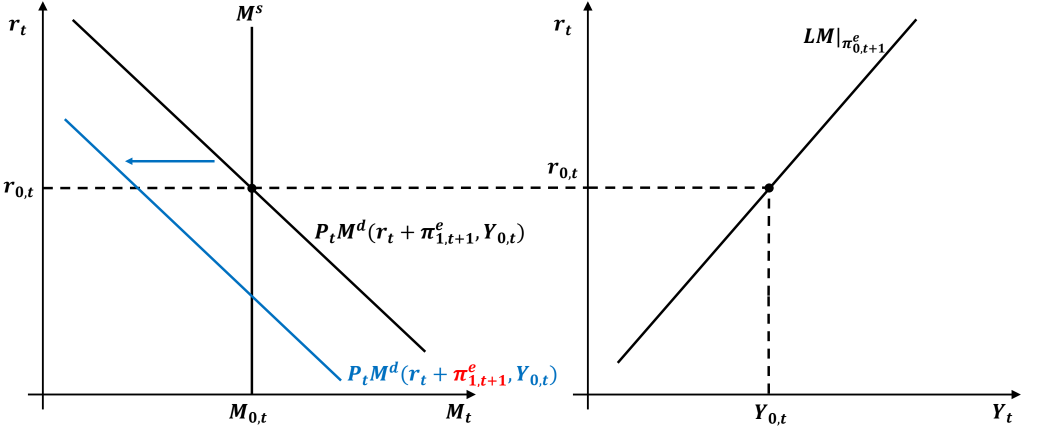
Question:
Suppose that agents come to expect a higher inflation rate which in the model is represented by an increase in the exogenous variable π^e_{t+1}.

a) Graphically show how this affects the endogenous variables of the in the Neoclassical model. Discuss how consumption, investment, the real wage, and the labor input change.

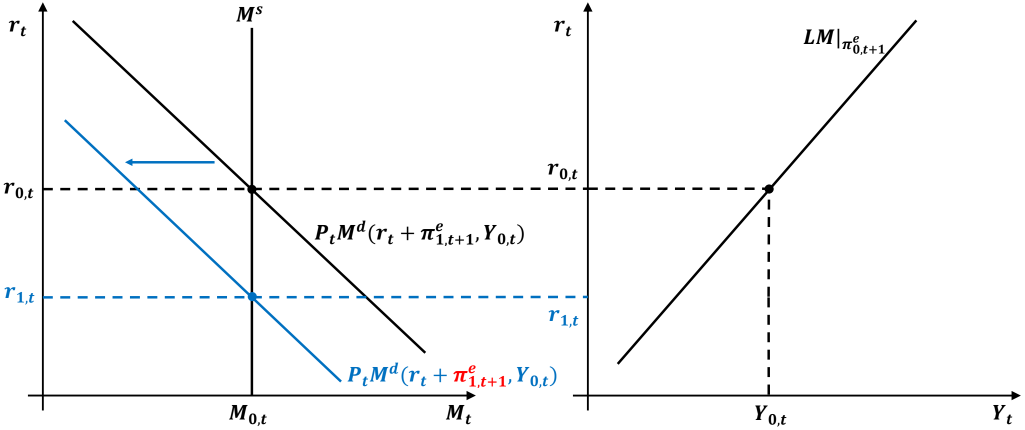
Money market $\pi^e_{t+1} \uparrow$



Money market $\pi^{\mathbf{e}}_{\mathbf{t+1}} \uparrow$

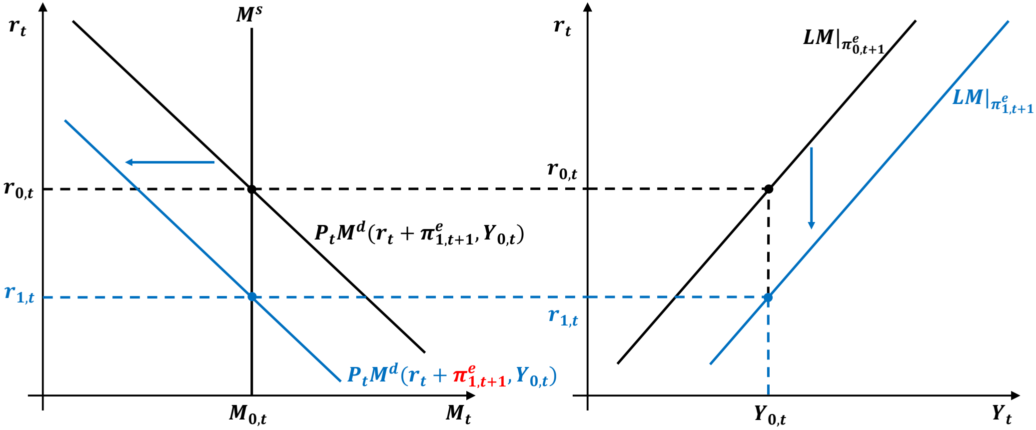


Money market $\pi^e_{t+1} \uparrow$

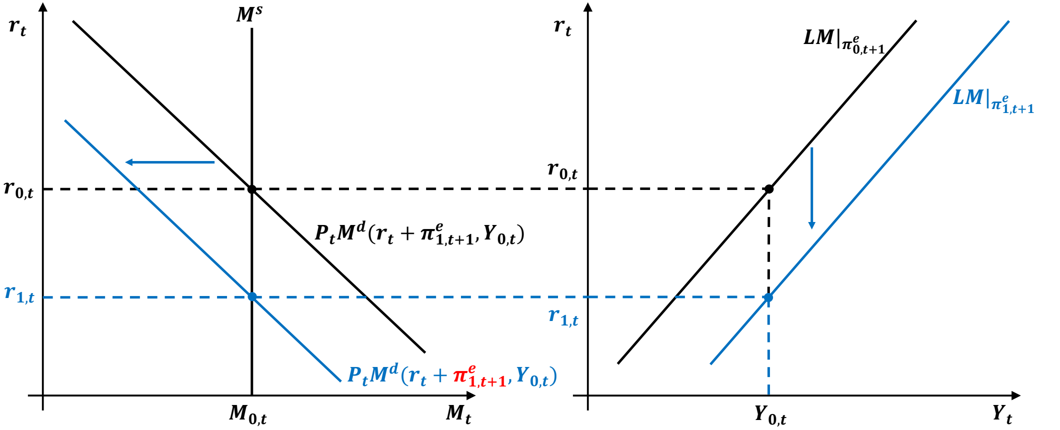


Money market $\pi^{e}_{t+1} \uparrow$

2. Increase in π^{e}_{t+1}



Money market $\pi^{e}_{t+1} \uparrow$



- Self-fulfillment: expecting higher future inflation results in higher inflation in the medium run ($\Rightarrow$ neoclassical model)

Question:
An observer looking at data generated from this model will observe a particular correlation between inflation and output conditional on a **negative** shock to A_t. Is that correlation consistent with the idea of the Phillips Curve as presented in class? What is missing from looking at a simple correlation between inflation and output when comparing it to the predictions of the Phillips Curve?

Model:

- Short run: $Y_{1,t} > Y_{1,t}^f$ and $P_{0,t} = P_{1,t} = \bar{P}_t$
- Medium run: $Y_{2,t} = Y_{1,t}^f$ and $P_{2,t} > P_{1,t}$
- Output gap $(Y_t - Y_t^f)$ decreases (closes from above), but price level increases $\Rightarrow$ inflation increases
- Positive output gaps put upward pressure on prices

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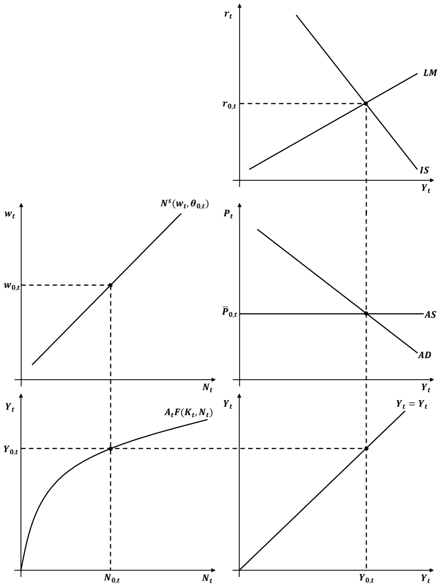
Phillips curve:

- Positive relation between inflation and the output gap
- Omitted variable: inflation expectations
- Changes in π_t^e may trigger changes in $\bar{P}_t$, which would shift the AS curve and result in higher prices for a given output gap

Question:
Use the graphical tools introduced in class to analyze the effects of an exogenous increase in the price level P in the short run run. Explain what is meant by "stagflation" and why it is especially challenging for policymaking.

4. Exogenous Shock to the Price Level



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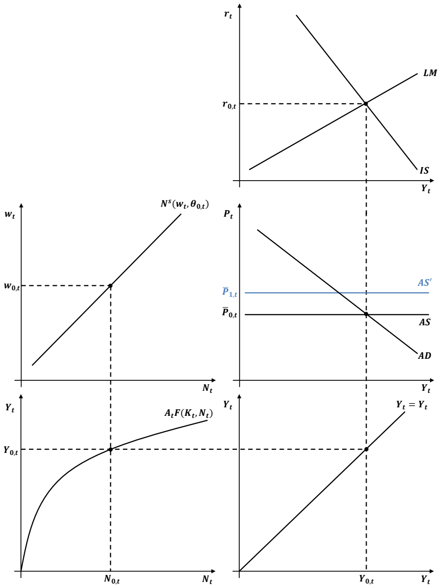

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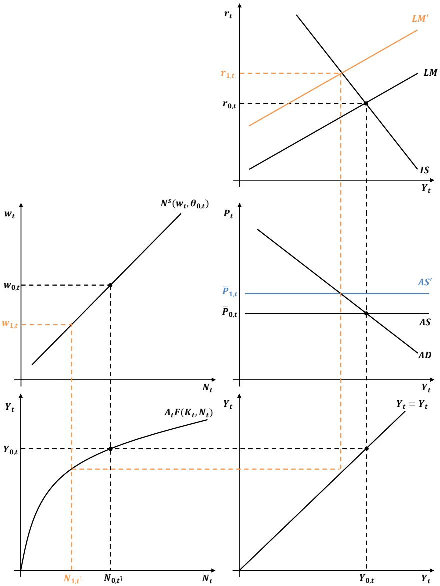


4. Exogenous Shock to the Price Level

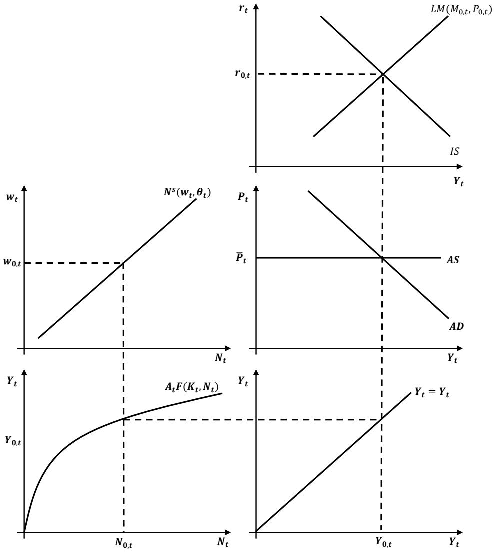
- Exogenous price increase shifts AS curve up
- AD curve remains unchanged
- $P \uparrow$ shifts LM curve to the left and r increases
- $P \uparrow$ needs to be met by contractionary monetary policy $(M^S \downarrow) \rightarrow$ 'passive' adaption
- If central bank does not react, inflation will not be stabilized
- $Y \downarrow$
- Firm will adjust to decreased aggregate output by using less labor input
- In consequence, real wage decreases

Stagflation

- "stagnant" and "inflation"
- Real world interpretation: increase in prices of intermediate inputs (e.g. price of oil)
- Y_t falling and P_t rising $\rightarrow$ high inflation rising and low output / growth / employment)

4. Contrast with stabilization policy after negative IS Shock

A decrease in G_t



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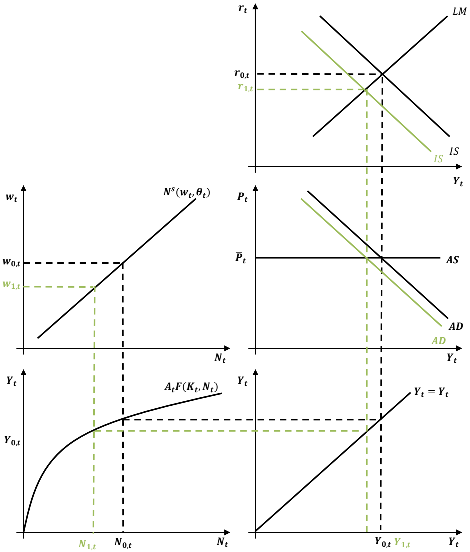

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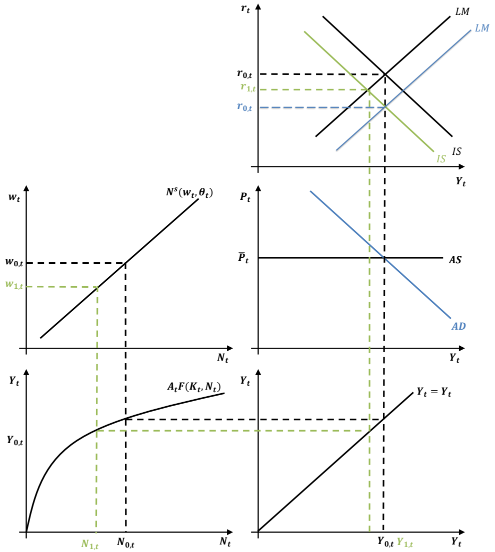

Transmission (NKM):

- $G_t \downarrow \rightarrow C \downarrow$ for a given $r_t \rightarrow$ IS shifts to the left
- AD shifts to the left
- NKM: due to sticky prices $(P_t = \bar{P}_t)$, $Y_t \downarrow$ and r_t and $w_t \downarrow$

Monetary Policy Reaction:

- Central bank can stabilize output and downward pressure on prices with expeditionary monetary policy