An Economical Business-Cycle Model

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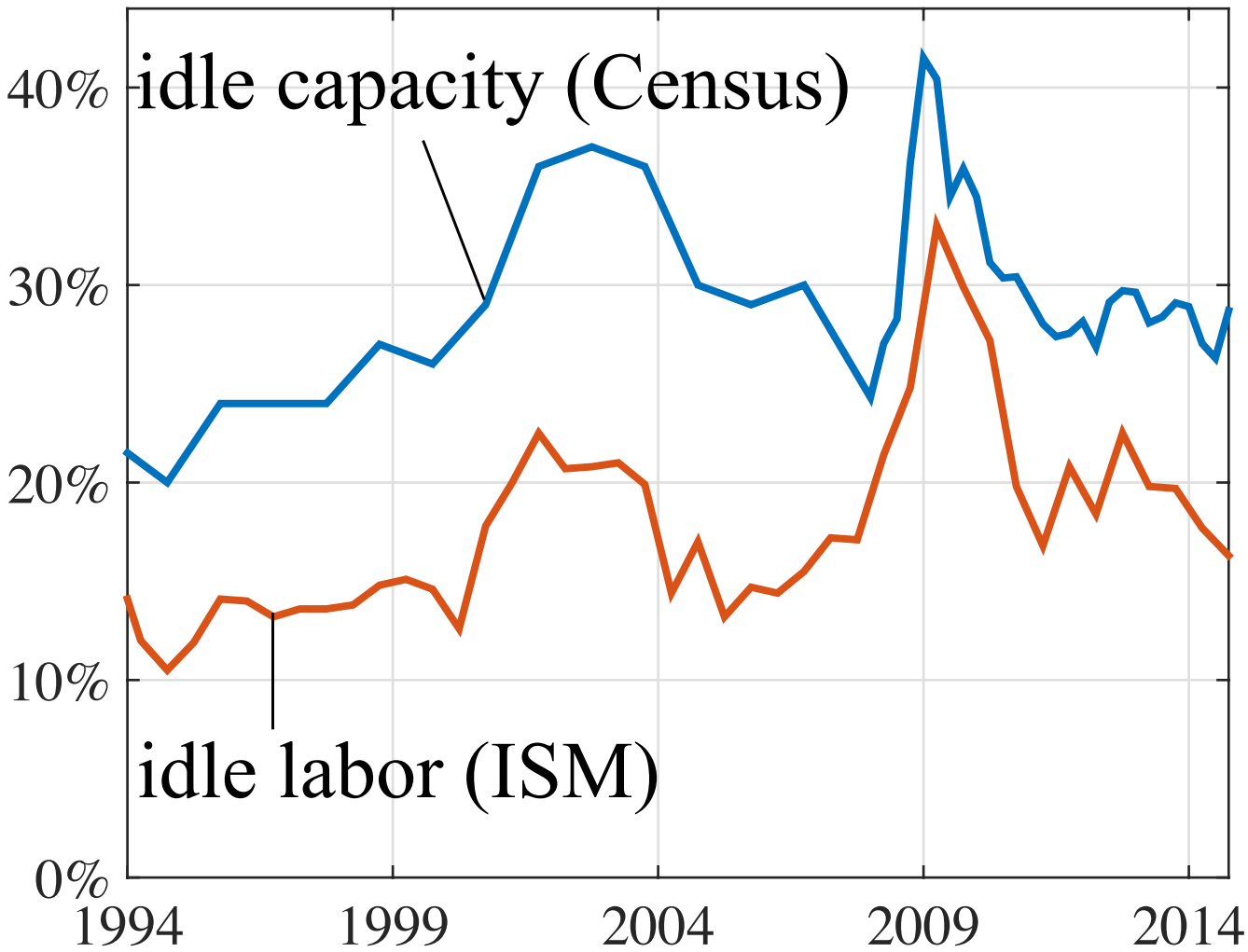
Objective of the paper

develop a tractable business-cycle model to

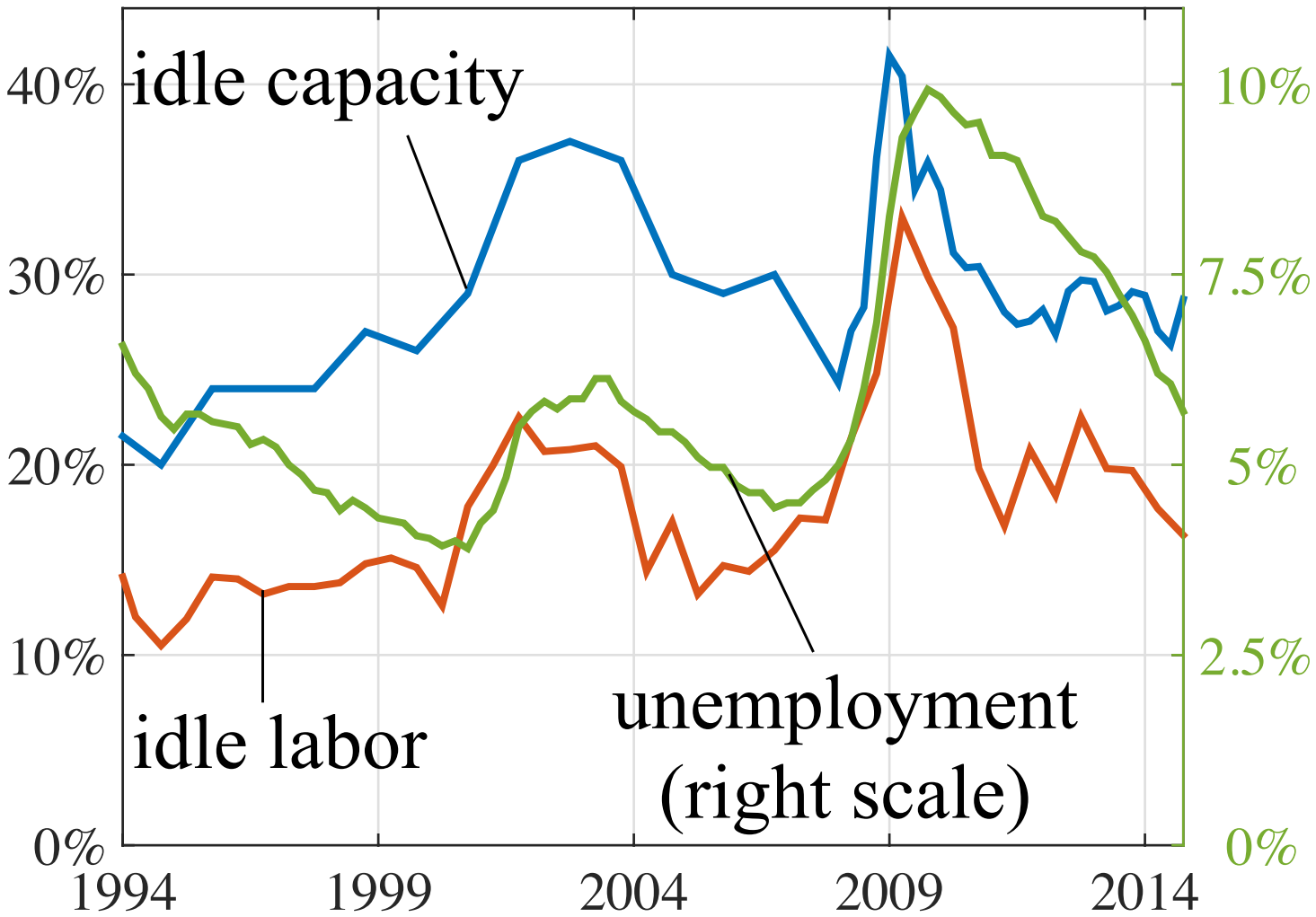
analyze monetary policy with

- variable slack (unemployment + idle labor + idle capacity)
- stable inflation

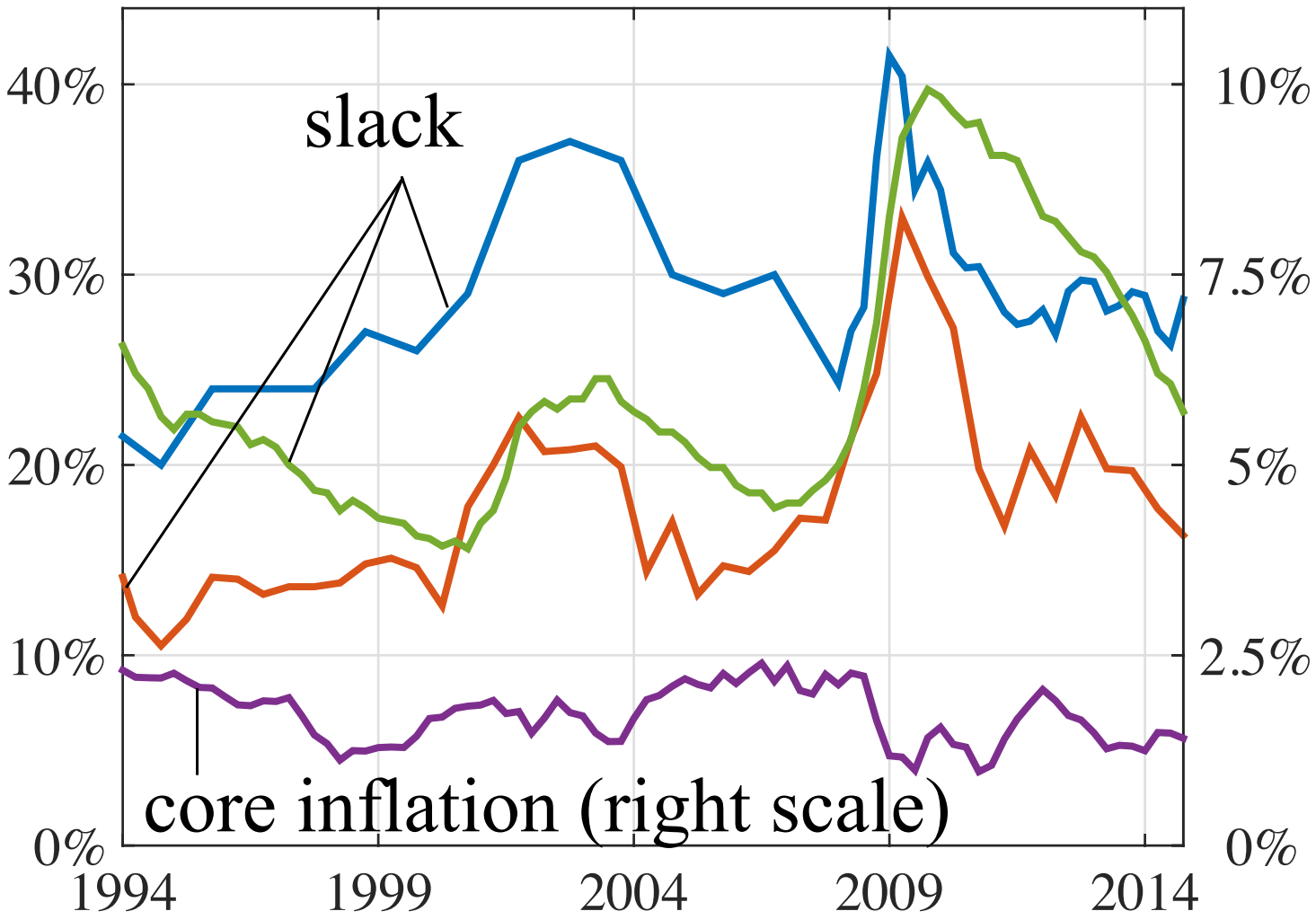
Slack and inflation in the US



Slack and inflation in the US



Slack and inflation in the US



Overview of the model

start from money-in-the-utility-function model of Sidrauski [AER 1967]

- add matching frictions on market for labor services as in Michaillat & Saez [QJE 2015]
- add utility for wealth as in Kurz [IER 1968]

Behavior of households

$$\max_{c,m,a} \int_0^{+\infty} e^{-\delta \cdot t} \cdot \left[\frac{\varepsilon}{\varepsilon - 1} \cdot c^{\frac{\varepsilon - 1}{\varepsilon}} + \phi(m) + \omega(a) \right] dt$$

$$\text{s.t. } \frac{da}{dt} = f(x) \cdot k - \left[1 + \tau(x) \right] \cdot c - i \cdot m + r \cdot a + s$$

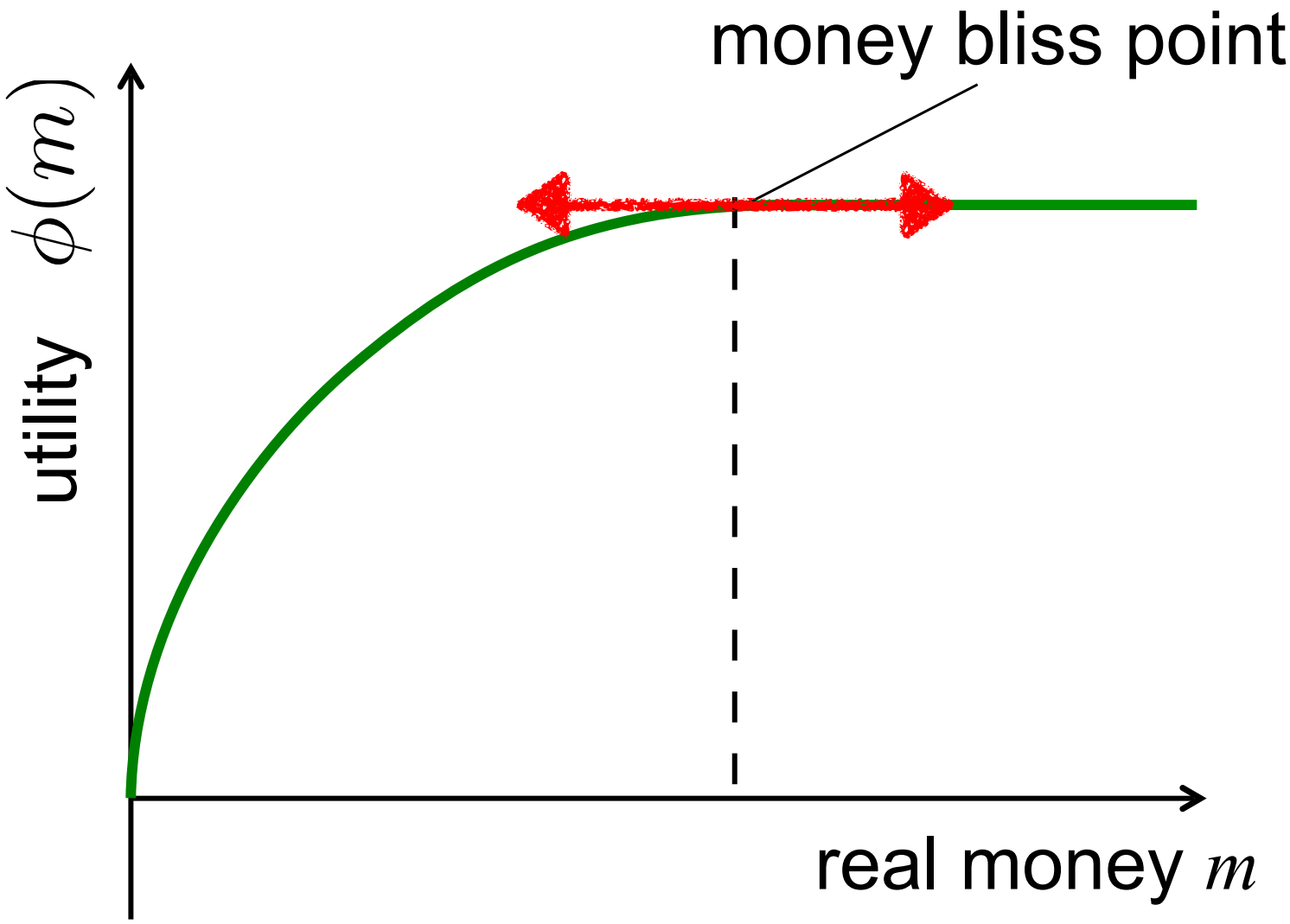
$c =$consumption; $m =$real money; $a =$real wealth;

$x =$market tightness; $1 - f(x) =$unemployment rate;

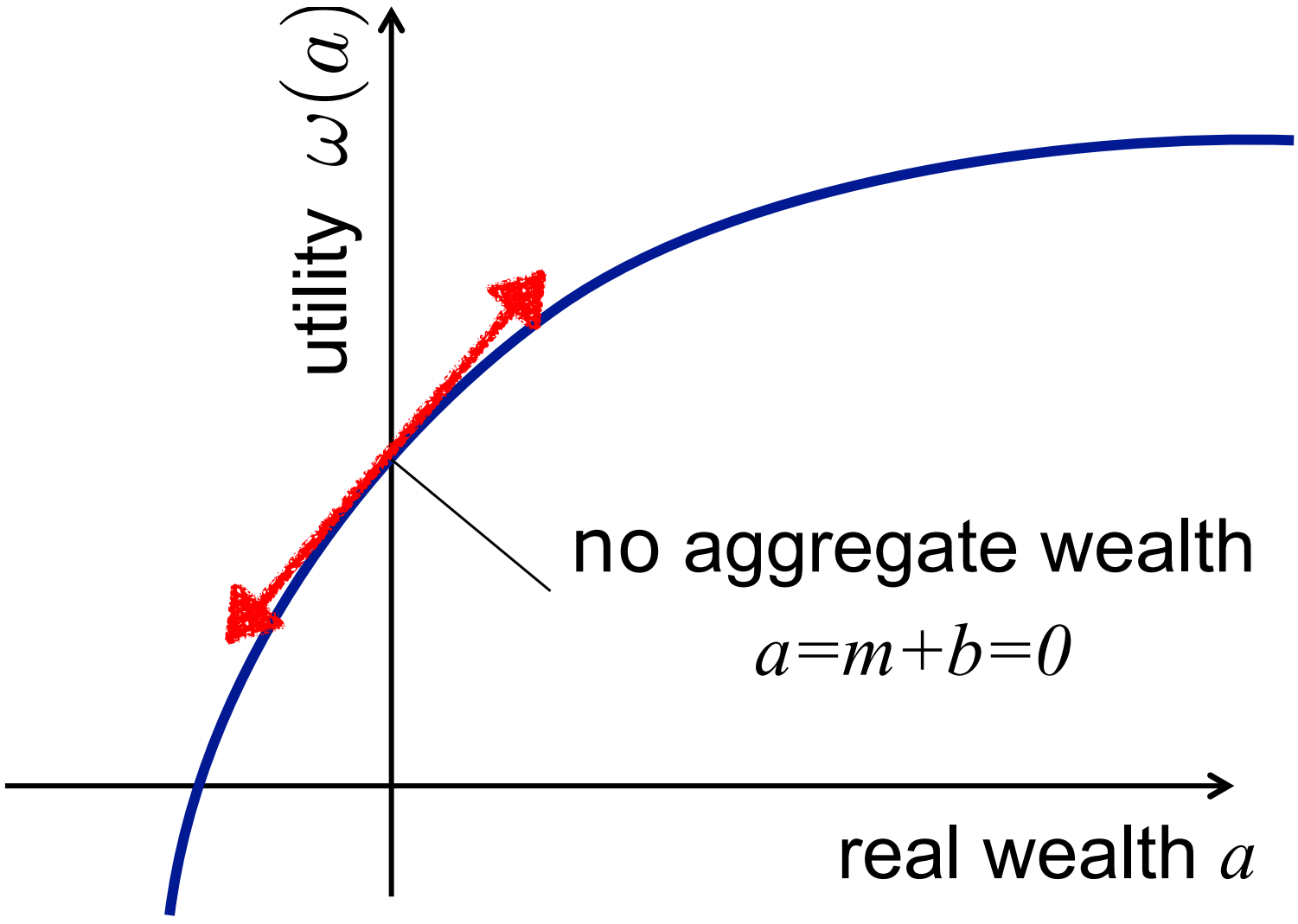
$\tau(x) =$matching cost; $i/r =$nominal/real interest rate;

$k =$ supply of services; $\delta =$discount rate; $s =$seignorage

Utility for real money



Utility for real wealth

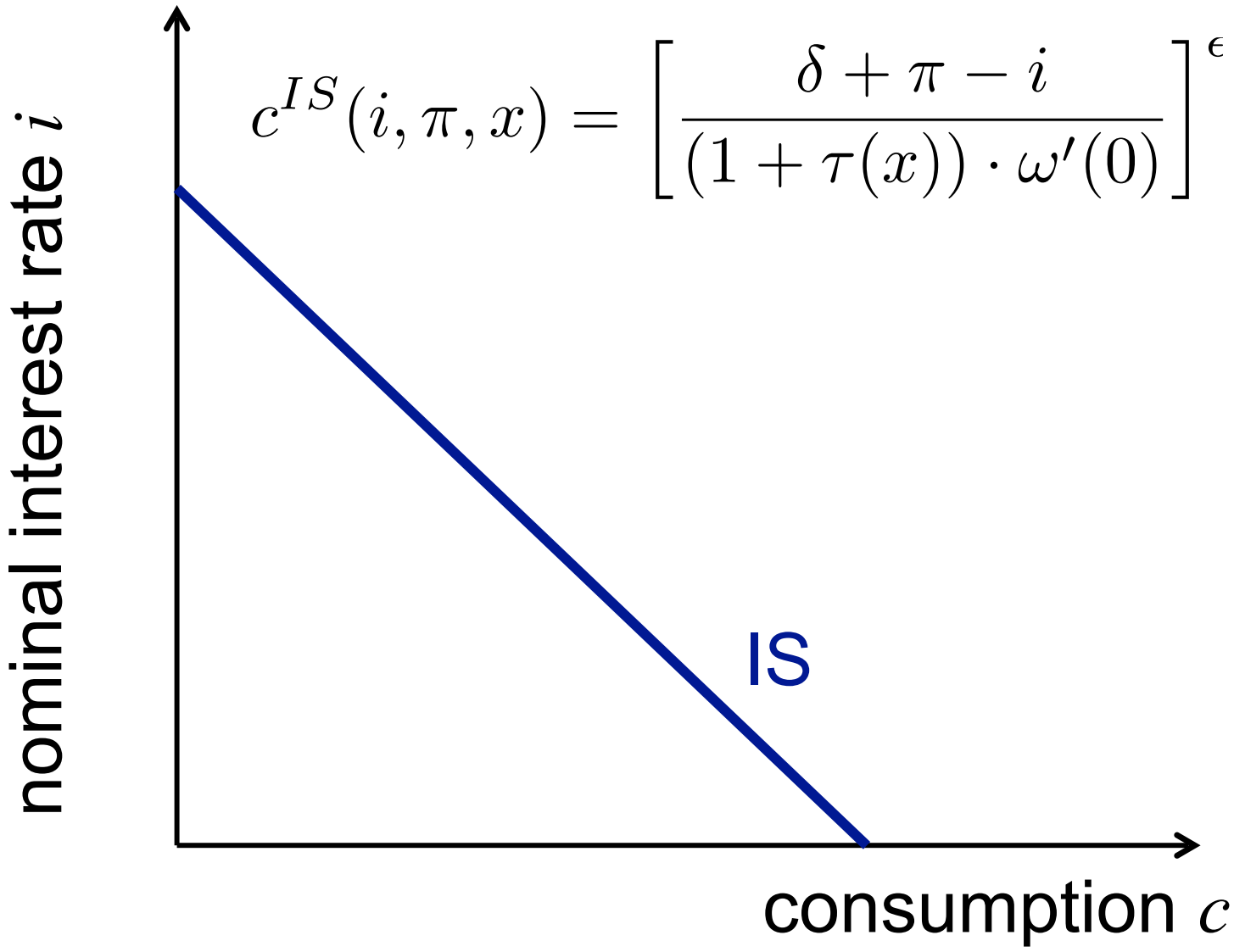


Steady state $\{a, m, i, c, x, \pi\}$

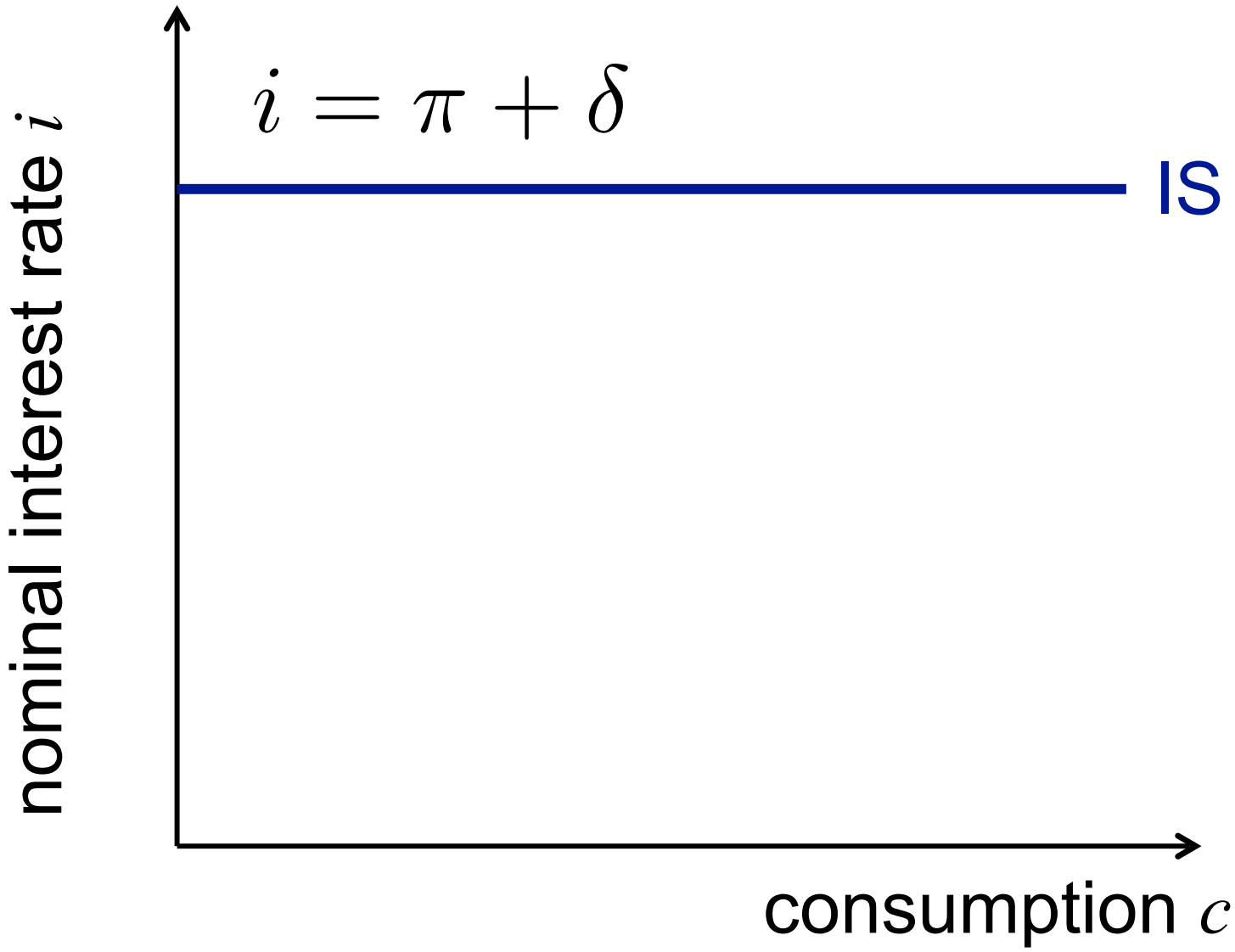
- no real wealth in aggregate: $a = 0$
- monetary policy sets real money m
- IS curve (consumption Euler equation)
- LM curve (demand for money)
- AS curve (supply and matching process)
- **inflation π is a fixed parameter**

IS curve with utility of wealth

$$c^{IS}(i,\pi,x) = \left[\frac{\delta + \pi - i}{(1+\tau(x)) \cdot \omega'(0)}\right]^{\epsilon}$$

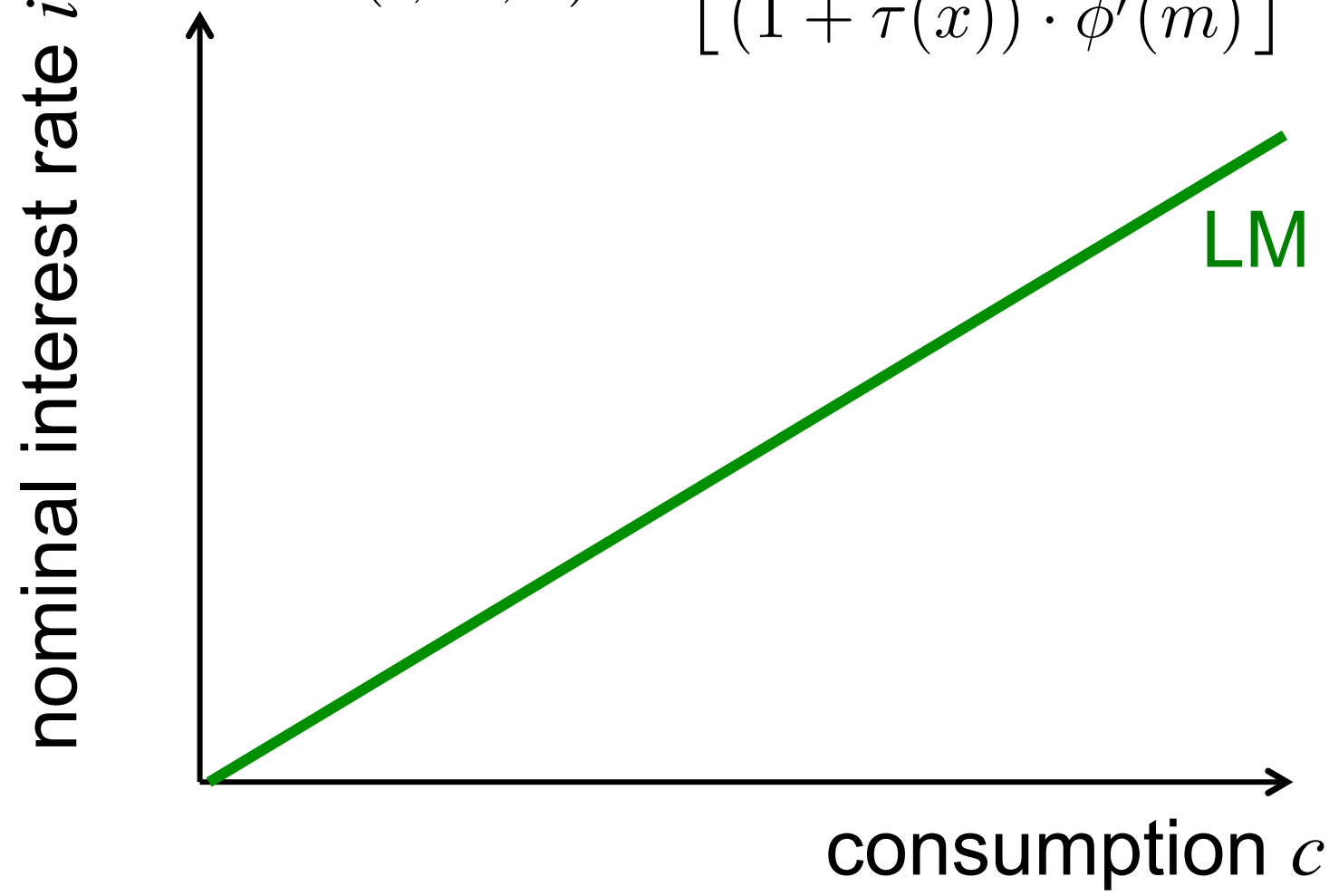


IS curve without utility of wealth

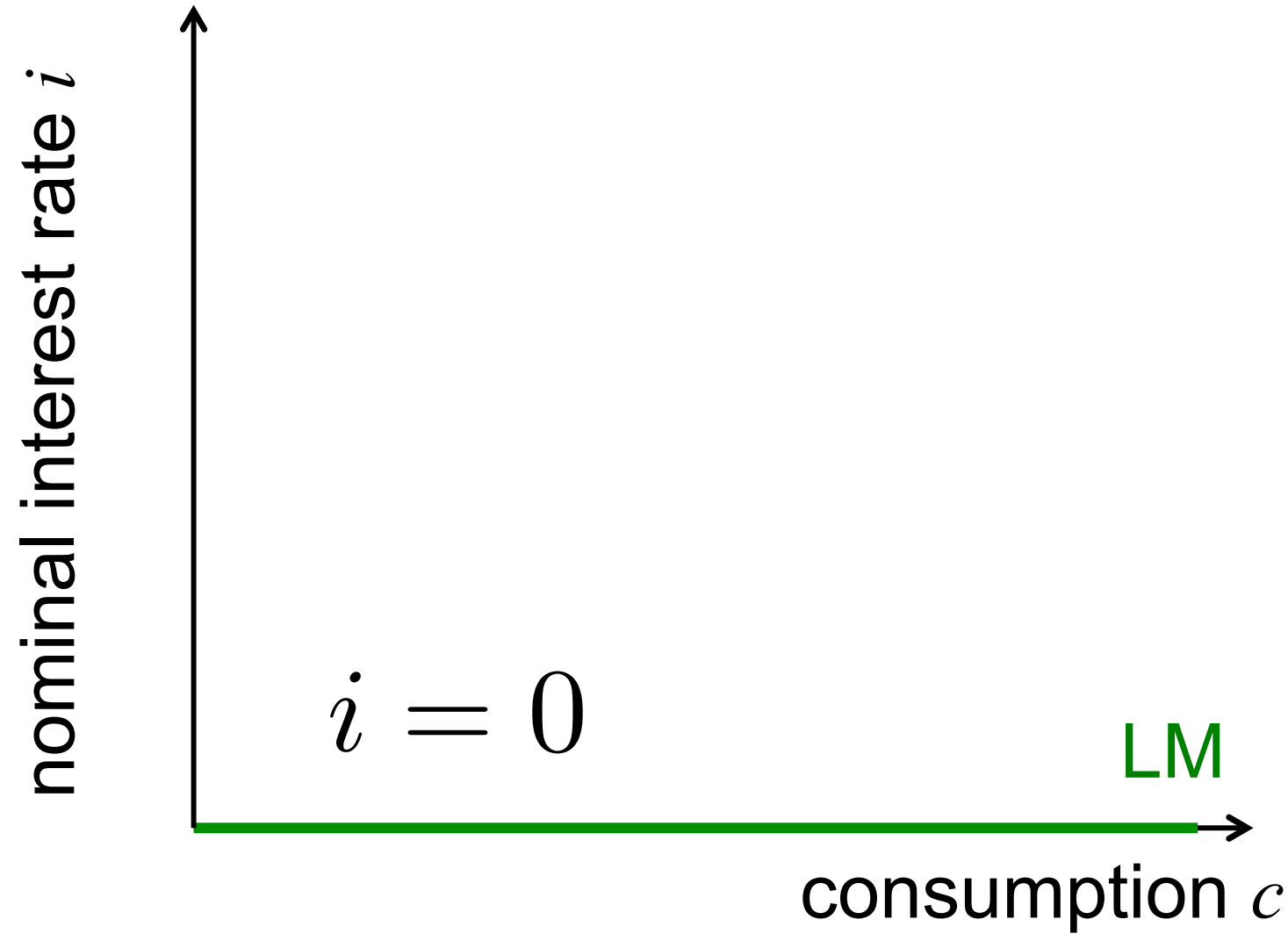


LM curve away from liquidity trap

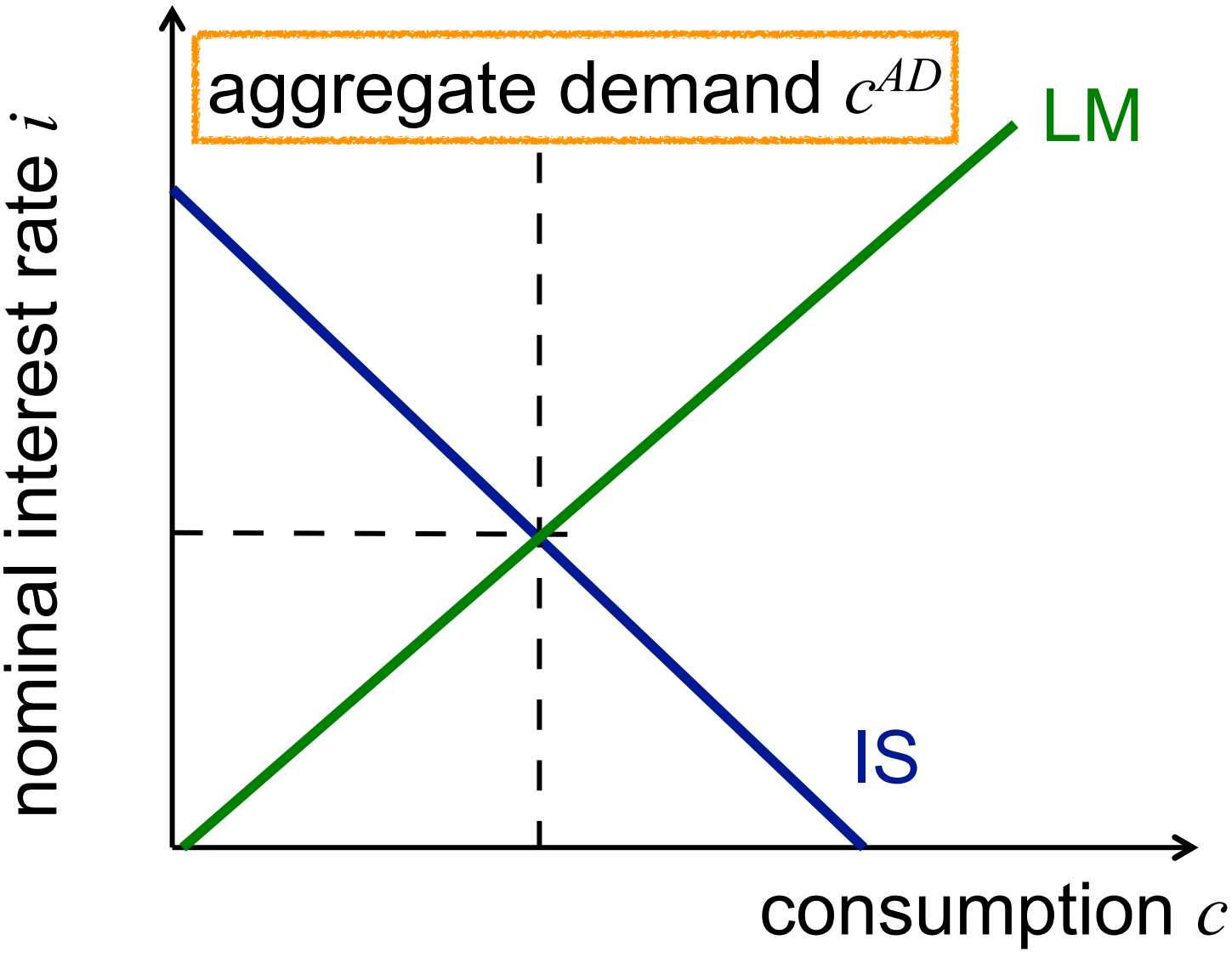
$$c^{LM}(i, m, x) = \left[\frac{i}{(1 + \tau(x)) \cdot \phi'(m)}\right]^{\epsilon}$$



LM curve in liquidity trap

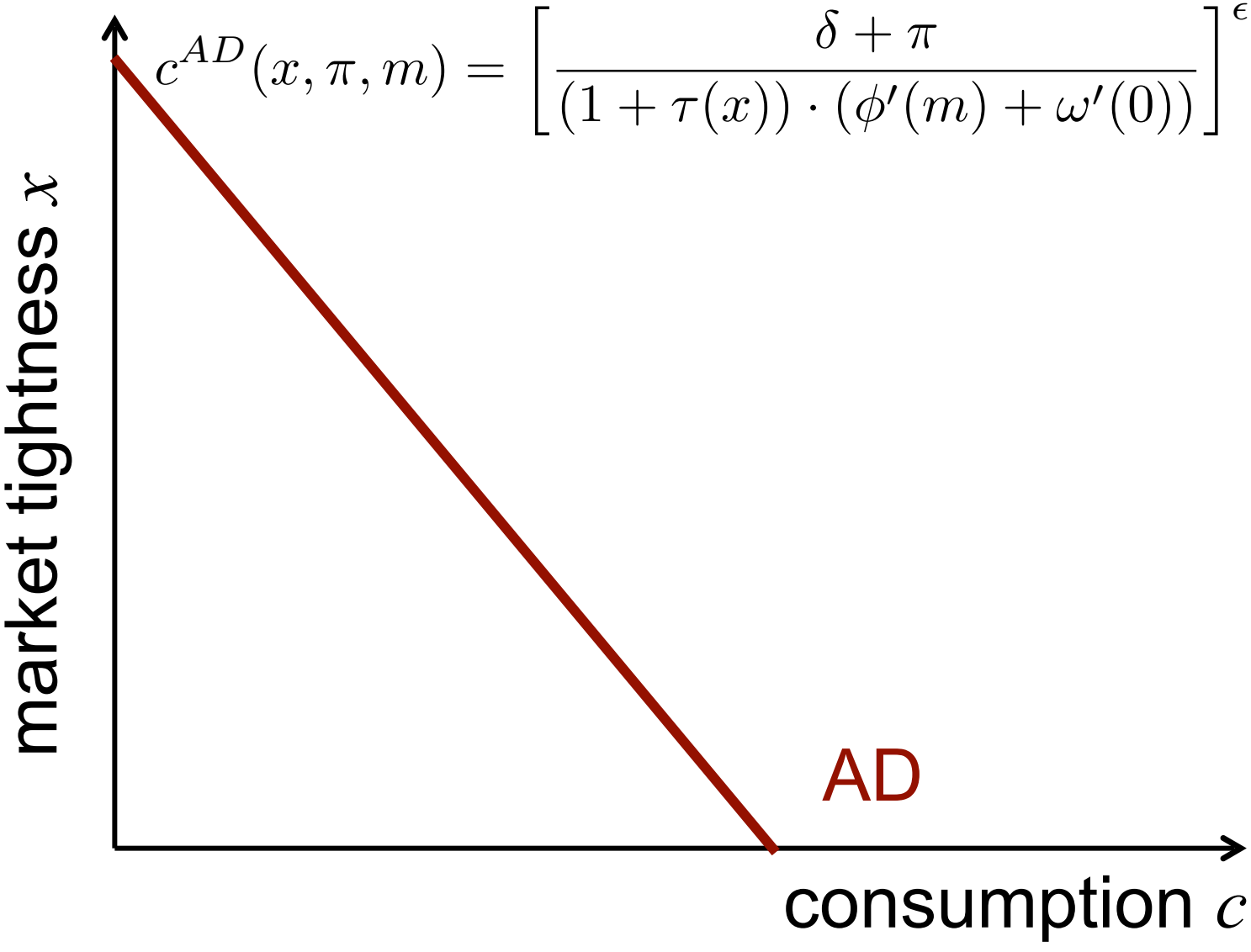


IS & LM determine AD and i



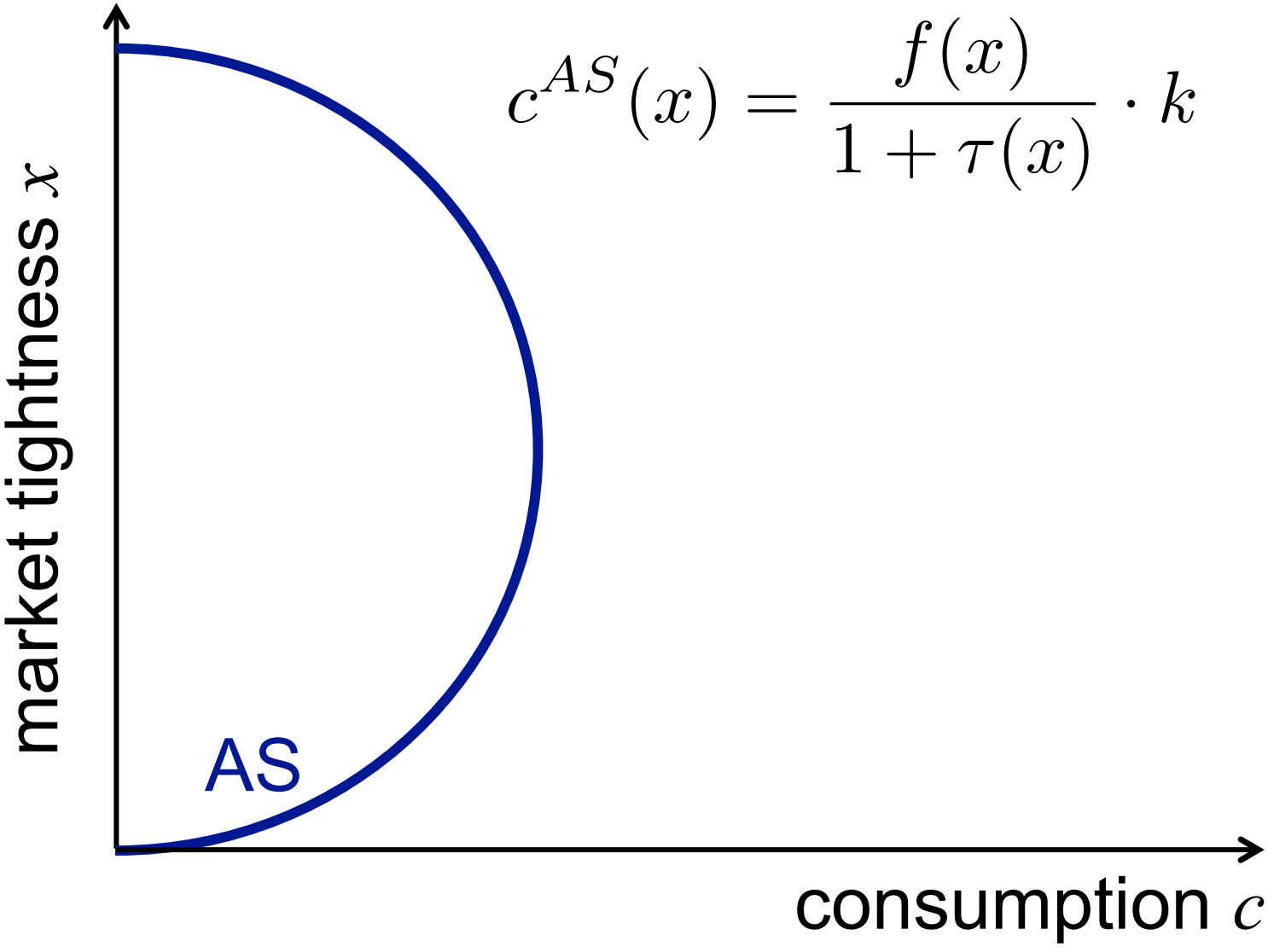
AD curve

$$c^{AD}(x, \pi, m) = \left[\frac{\delta + \pi}{(1 + \tau(x)) \cdot (\phi'(m) + \omega'(0))} \right]^{\epsilon}$$

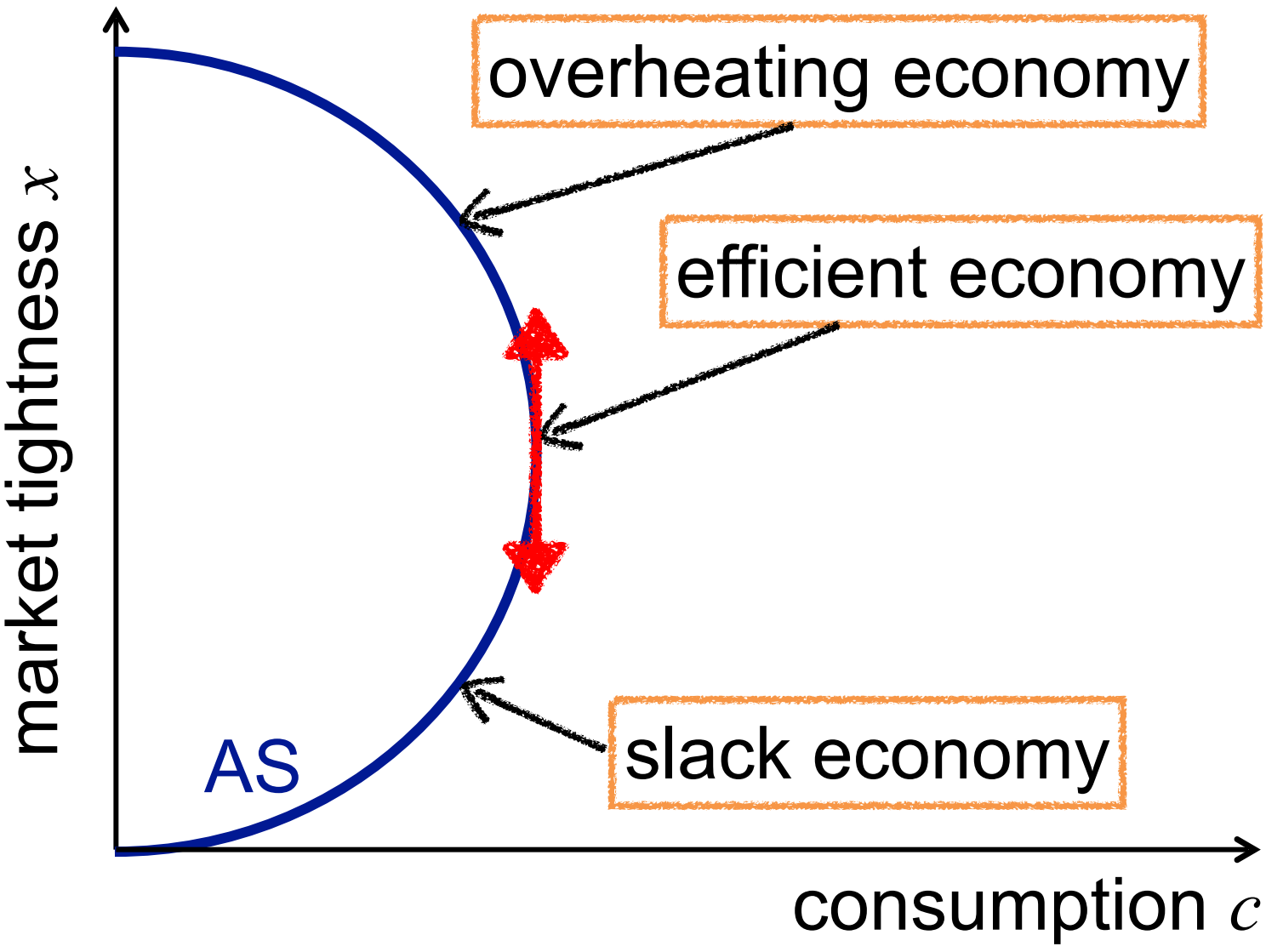


AS curve

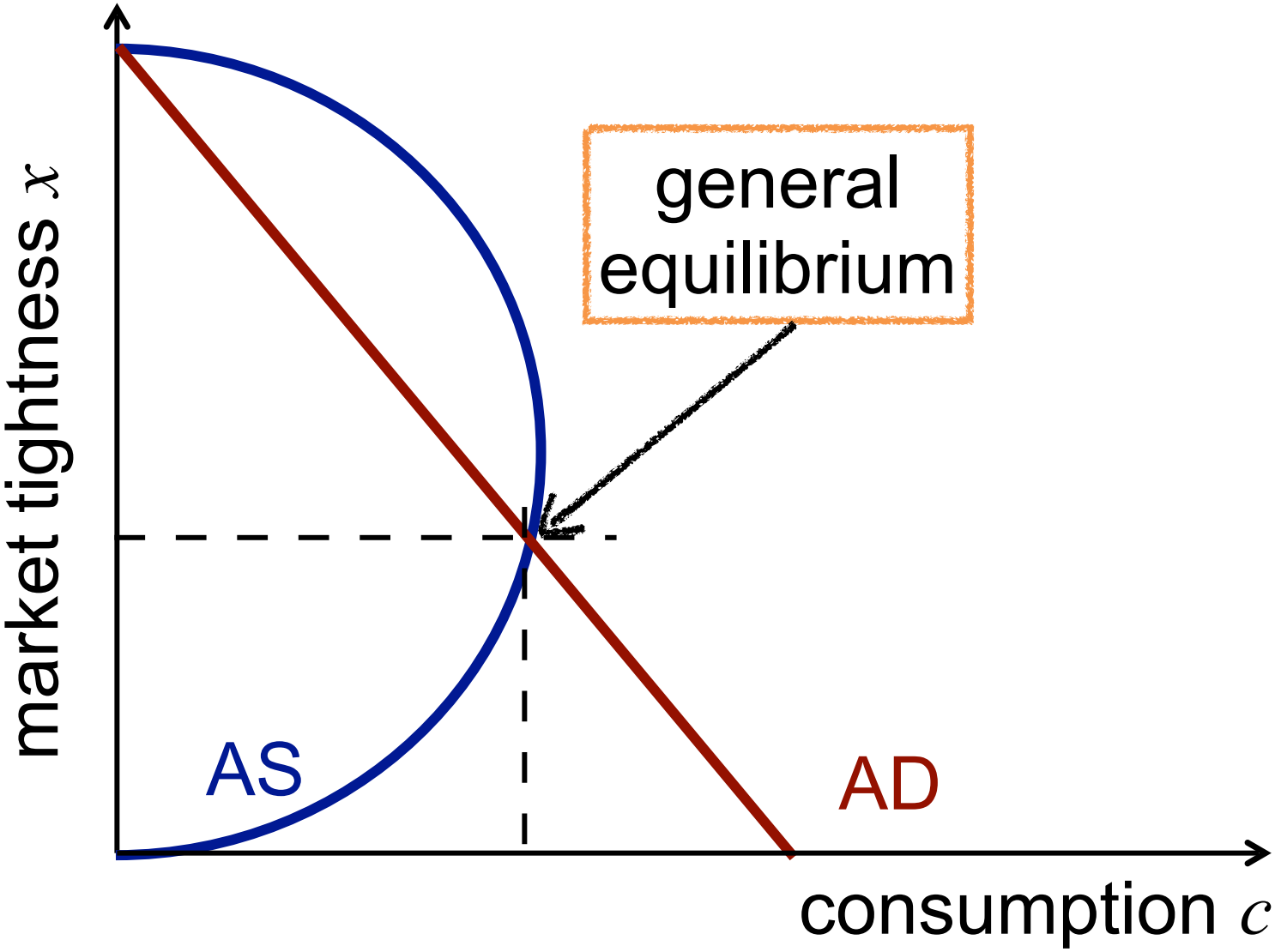
$$c^{AS}(x) = \frac{f(x)}{1+\tau(x)} \cdot k$$



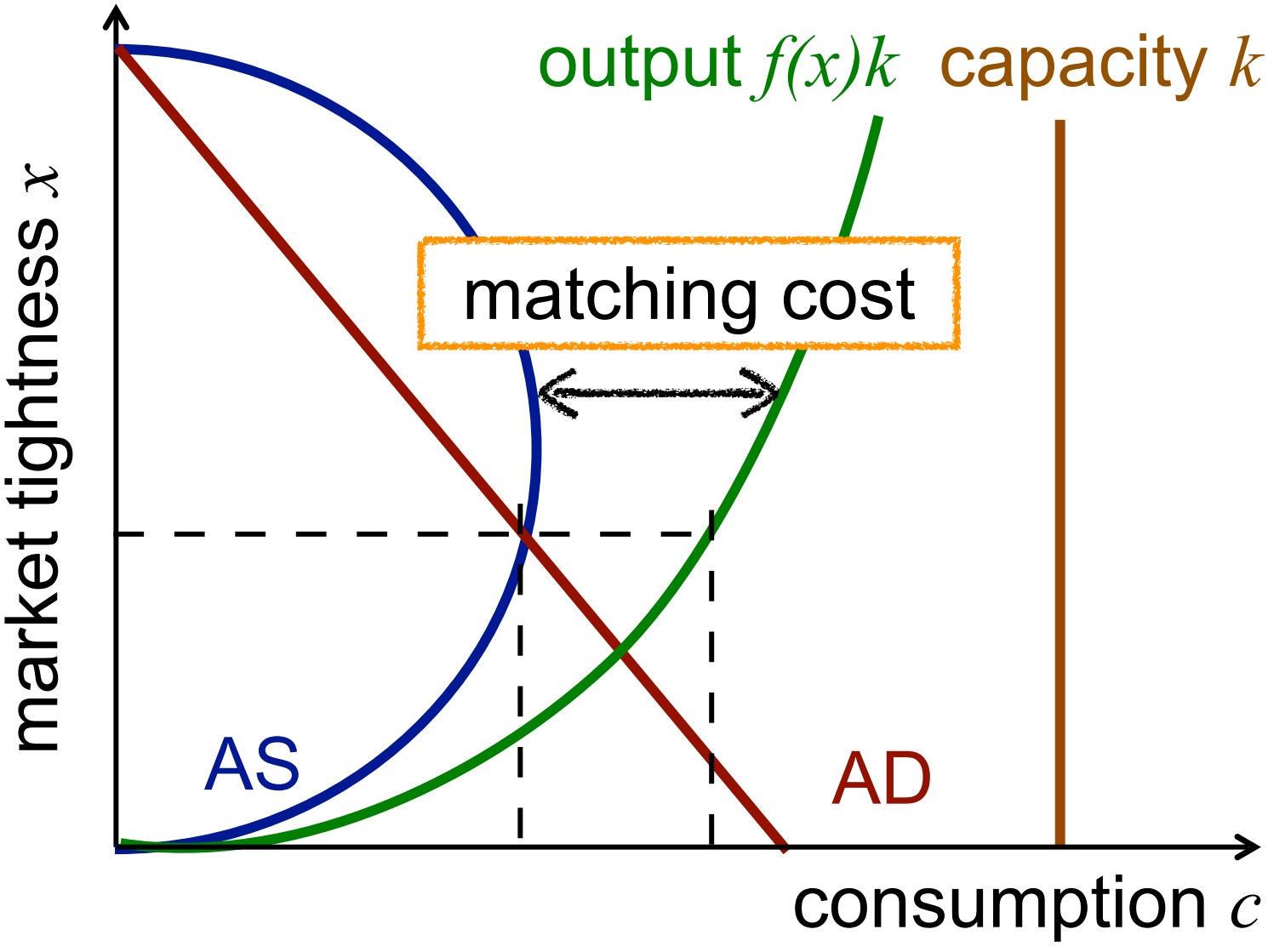
AS curve


overheating economy
efficient economy
slack economy
AS
market tightness x
consumption c

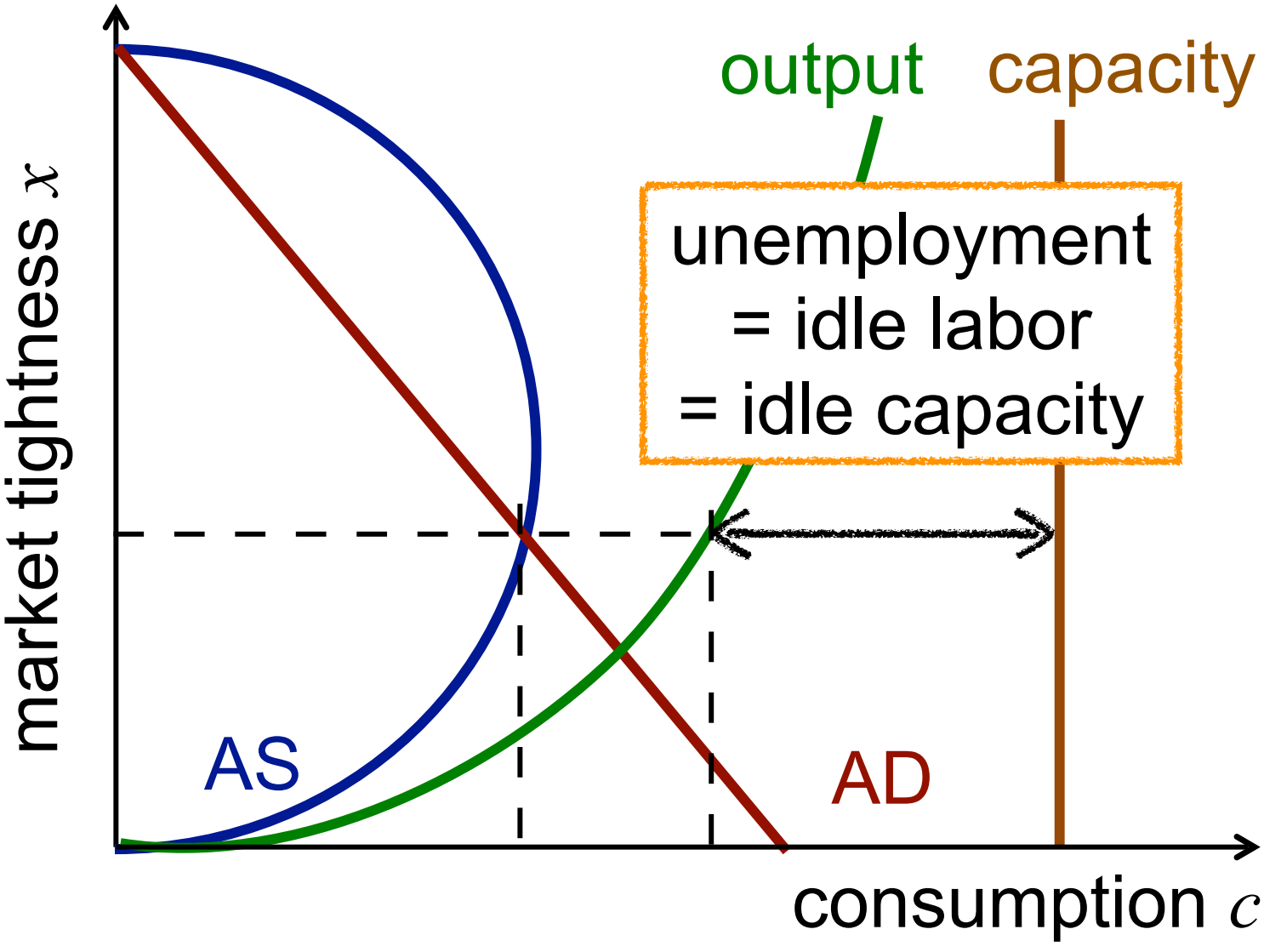
AS & AD determine c and x



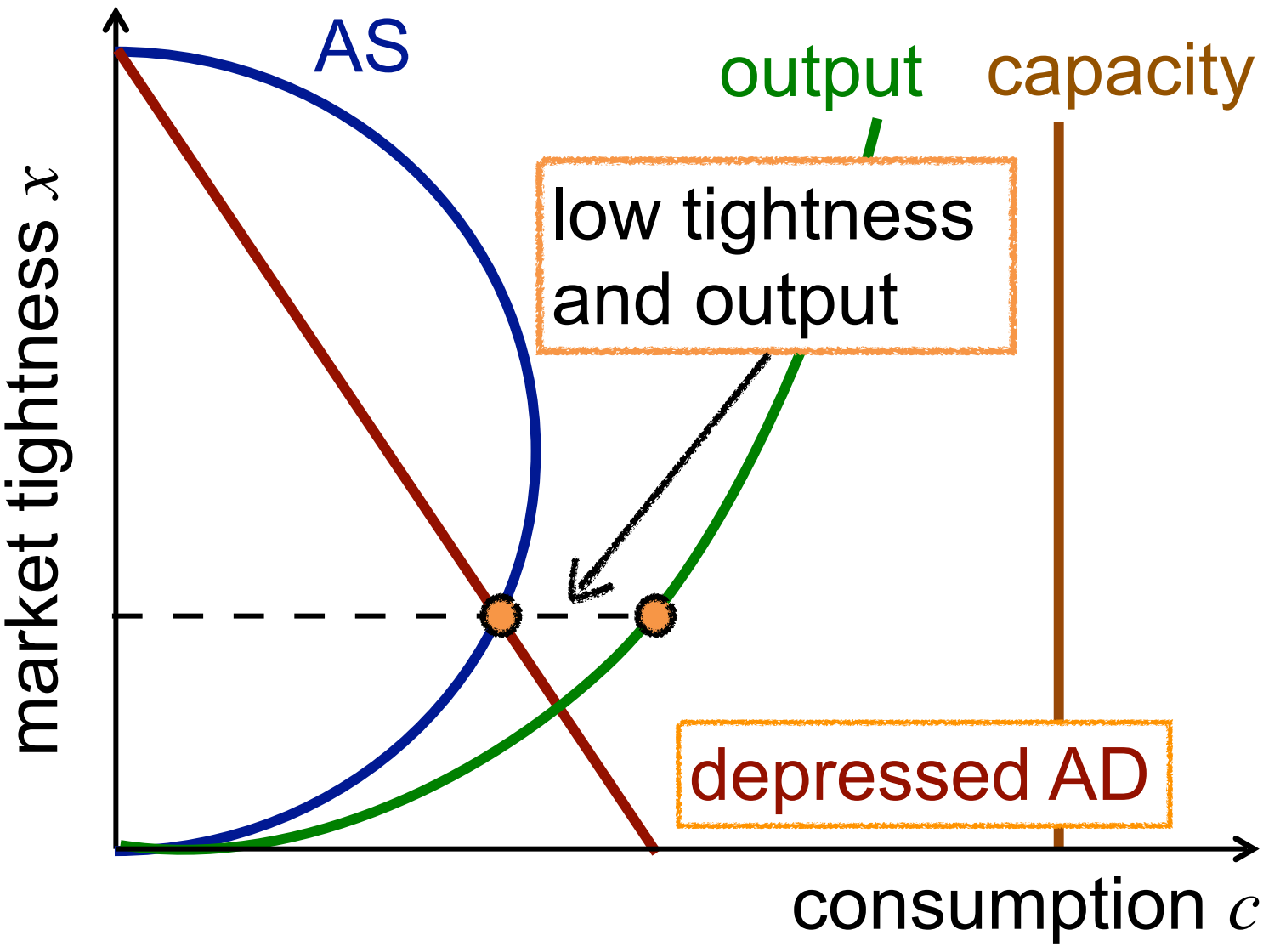
AS & AD determine output



AS & AD determine unemployment



Increase in money supply



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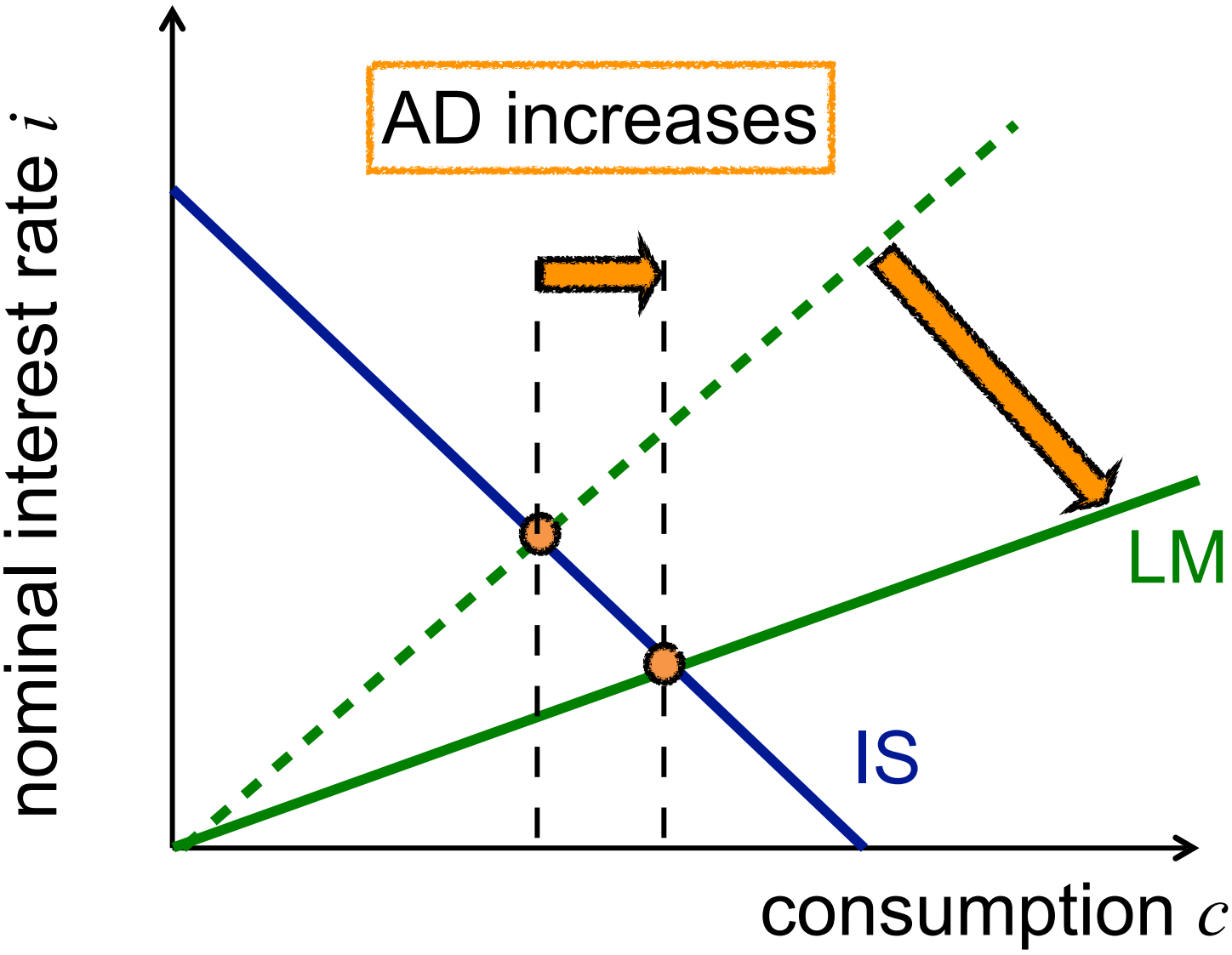

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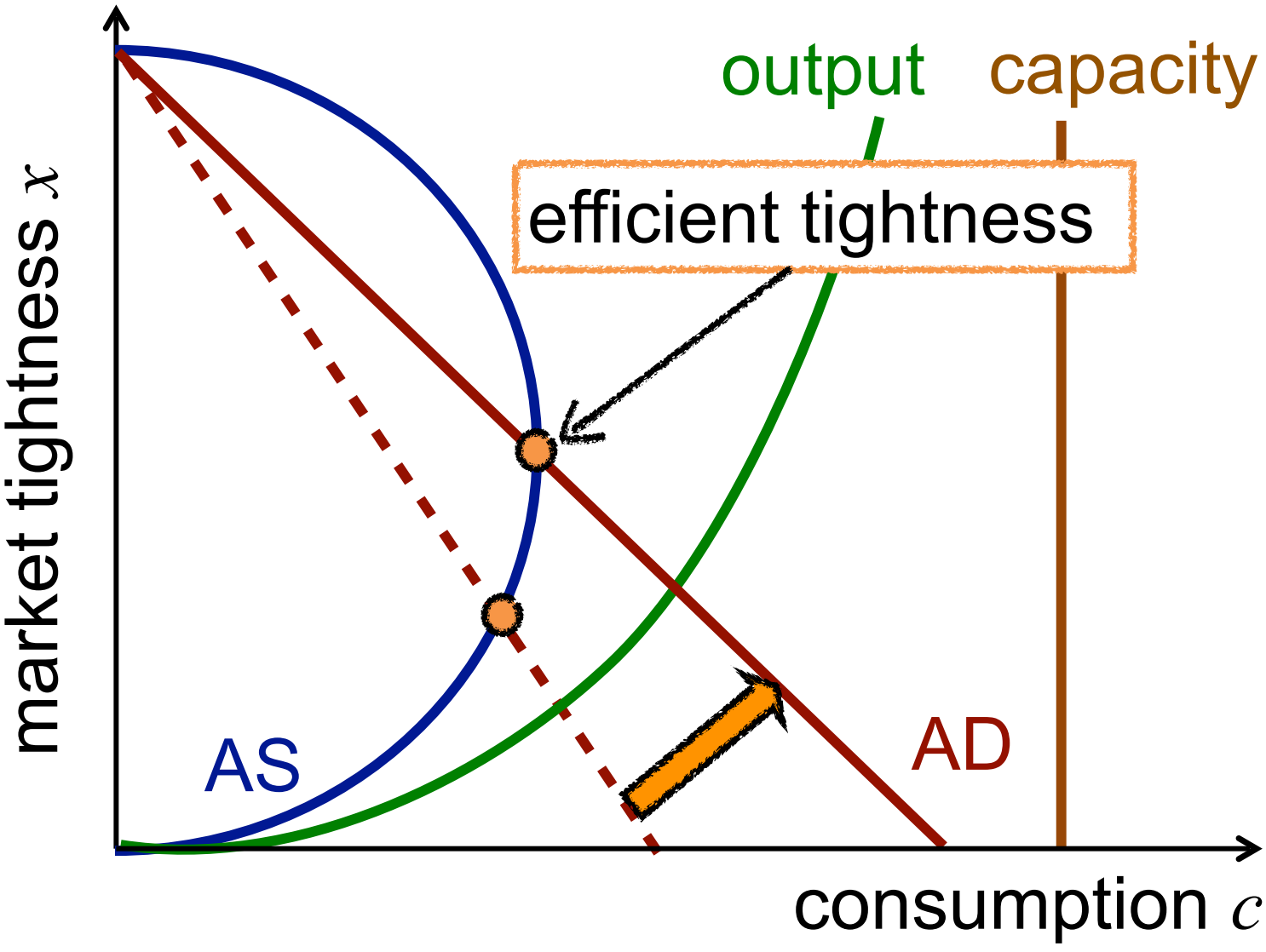
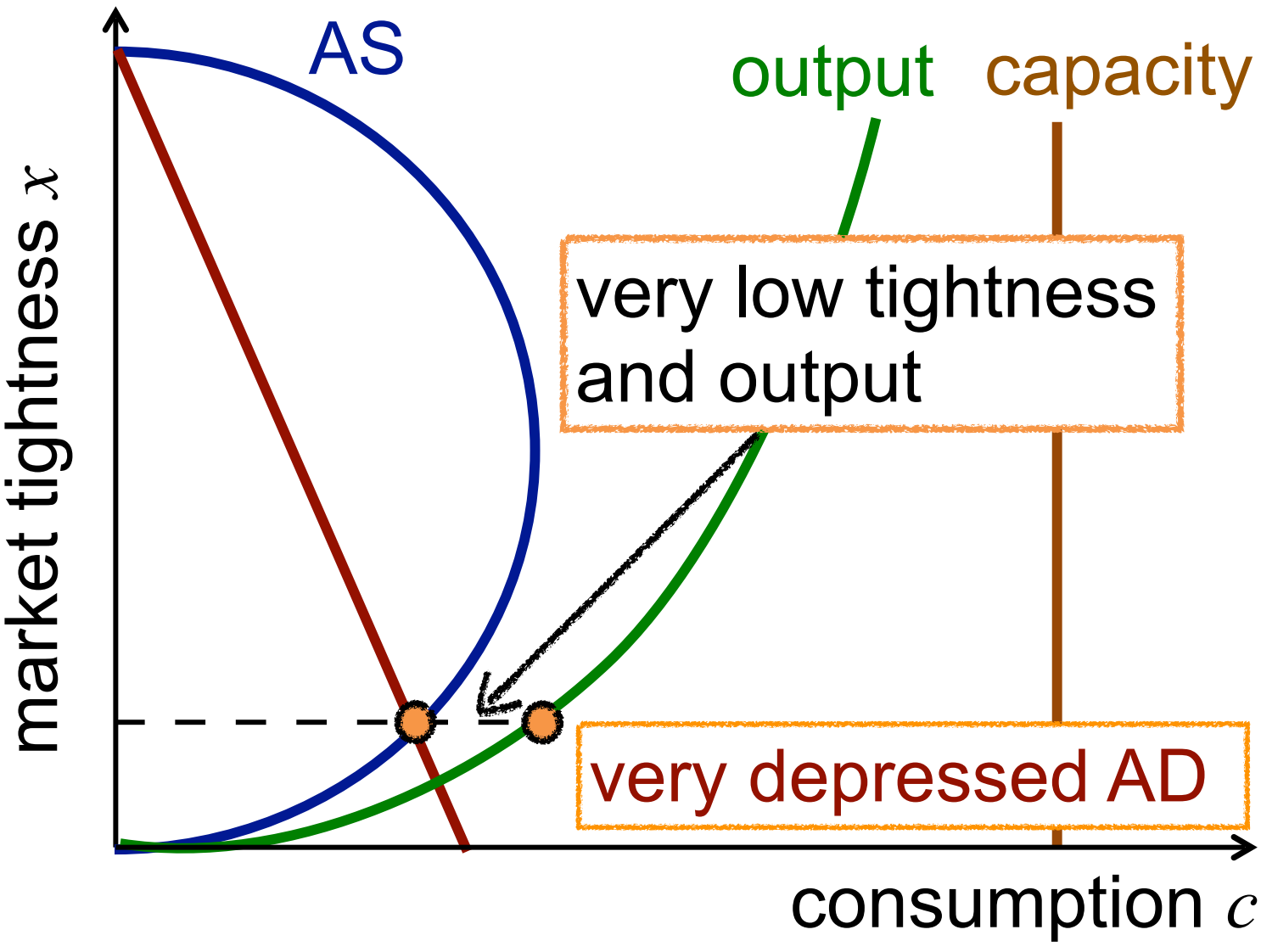


Money supply in a liquidity trap



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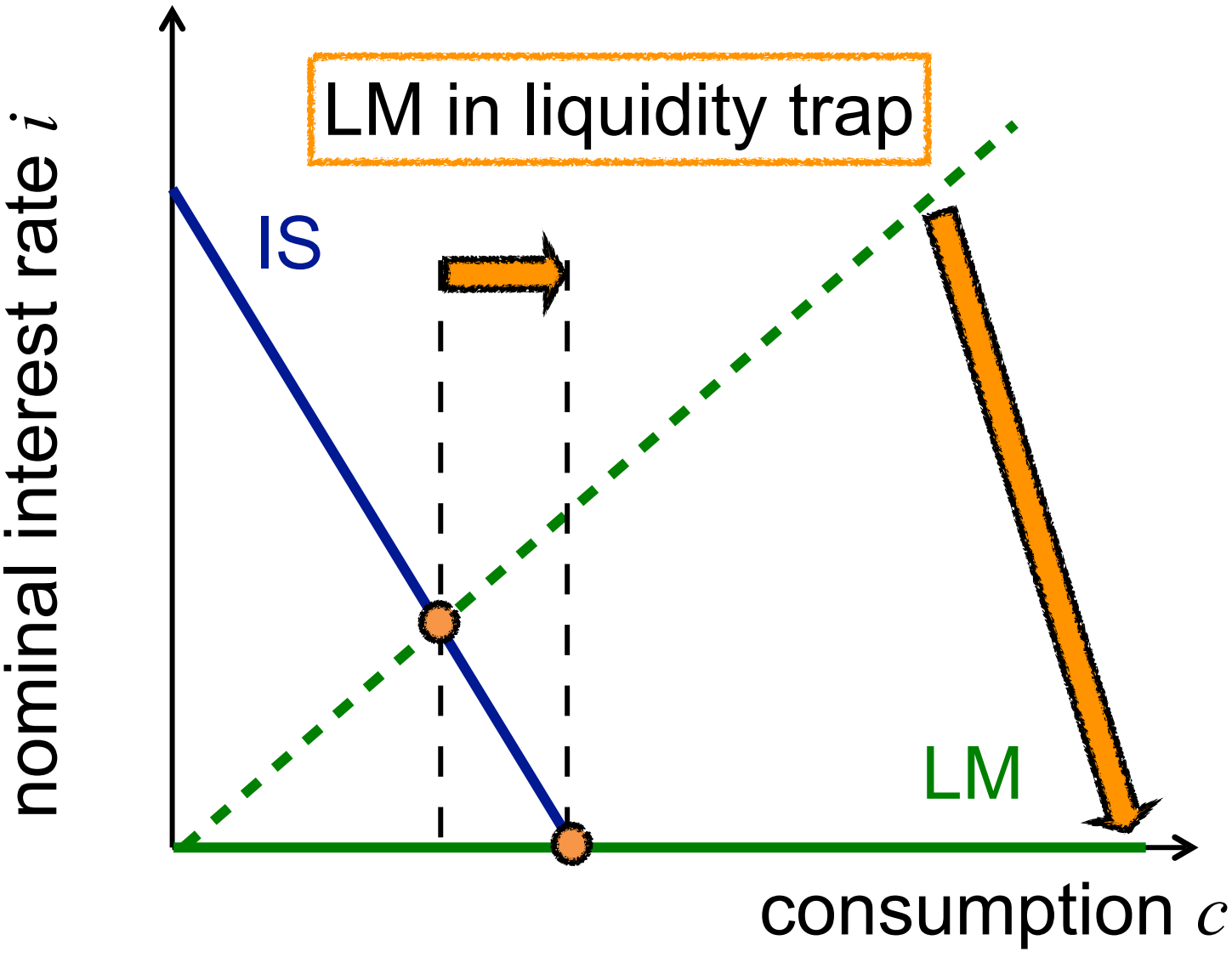

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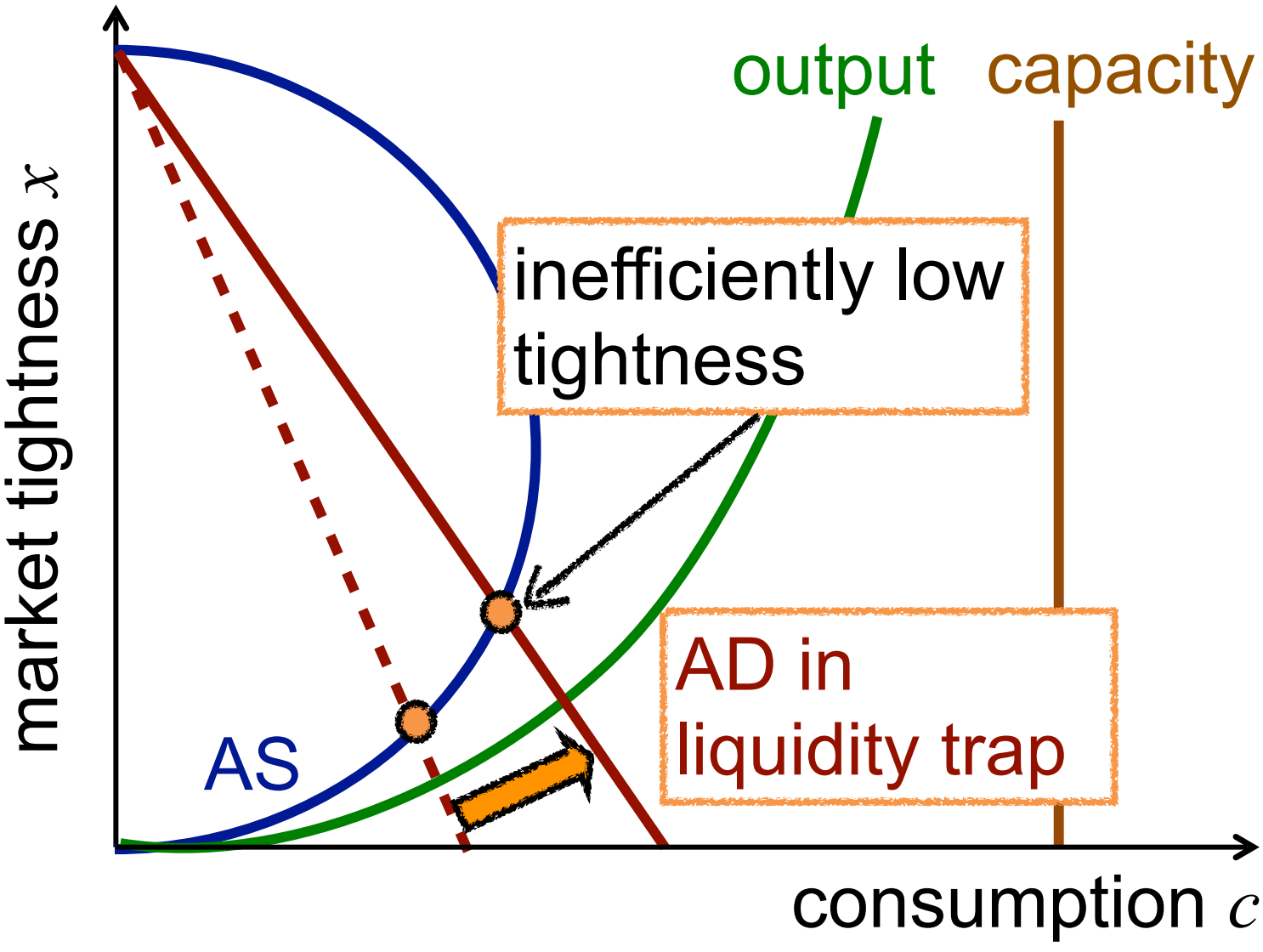

Extensions in the paper

- policies to stimulate IS curve: tax on wealth

  + helicopter drop of money

- inflation and tightness dynamics from

  directed search and price-adjustment cost