

Keynesian AS-AD

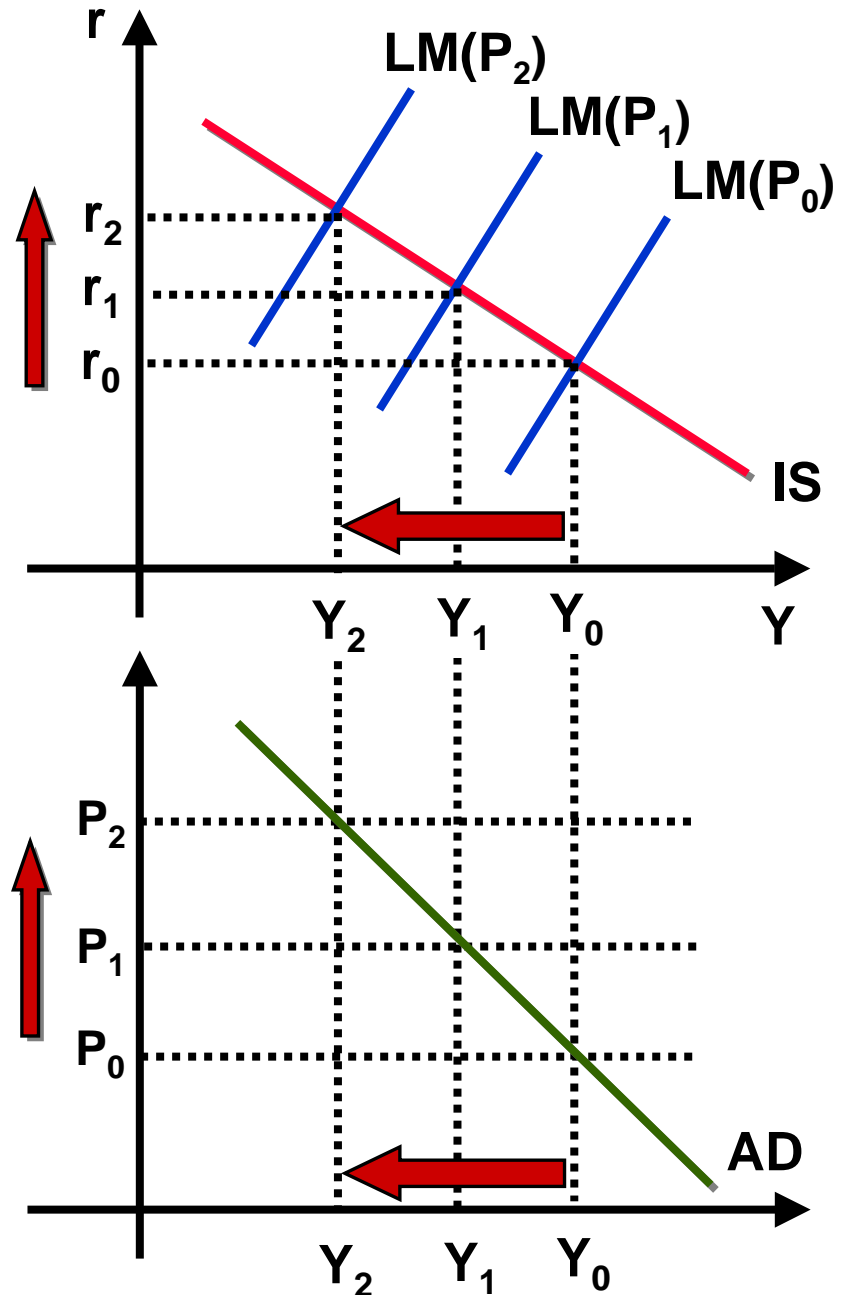
The Keynesian System (IV):
Aggregate Supply and Demand

Constructing AD

- **The AD curve can be constructed from the IS-LM apparatus.**
- **Recall that the price level is established outside the IS-LM model.**
- **We construct AD by observing the how changes in the price level affect the IS-LM model.**

AD from IS-LM

1. Price levels are increased, with $P_0 < P_1 < P_2$.
2. LM shifts to the left with increasing P because real money balances decline.
3. Interest rates rise.
4. Investment and durable goods expenditures fall as interest rates rise.
5. Plot price levels against the resulting output (Y) levels.
6. This is aggregate demand.
7. Thus AD is embedded in the logic of IS-LM.



Constructing AS

- **To do this we go back to our classical model and observe the effects of having a fixed nominal wage.**
- **A less extreme view is to consider nominal wages as being “sticky”—meaning they adjust relatively slowly.**

Sources of Wage Rigidity (1)

- **General wage changes vs. relative wage changes**
- **General wage changes**
 - If real wages (w/P) decline because of inflation ($P \uparrow$), then everyone suffers the same. This is a general real wage decline, and all workers are equally affected.
 - Thus workers do not react as strongly to this. Even if they did, there is little that they could do about it.

Sources of Wage Rigidity (2)

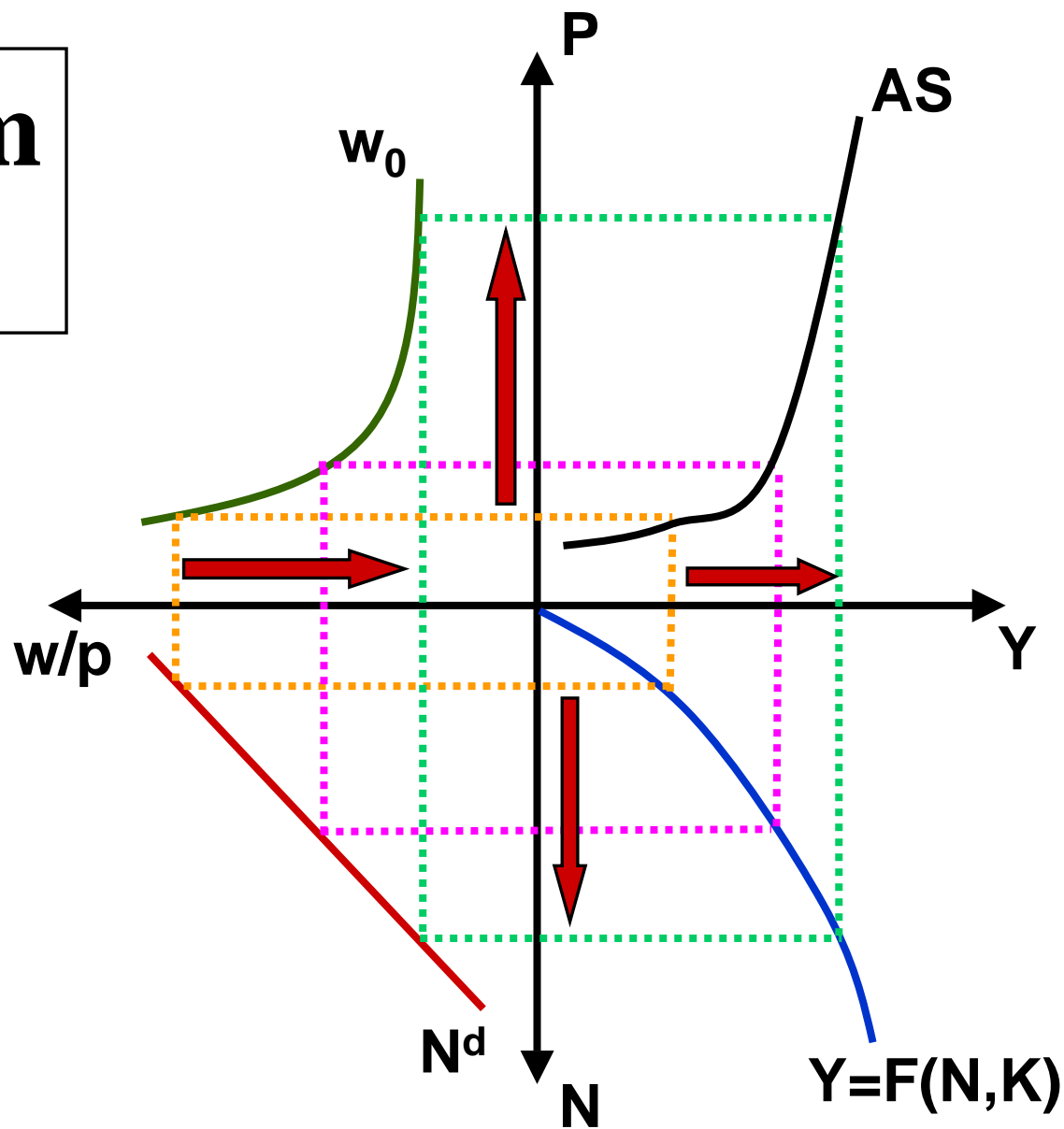
- **Relative wage change**

- If an employer reduces the wages of an individual worker, the worker's relative wage and buying power are affected.
- The worker may permanently have to live decreased relative buying power.
- The worker may become disgruntled, and labor supply may become reduced.

Sources of Wage Rigidity (3)

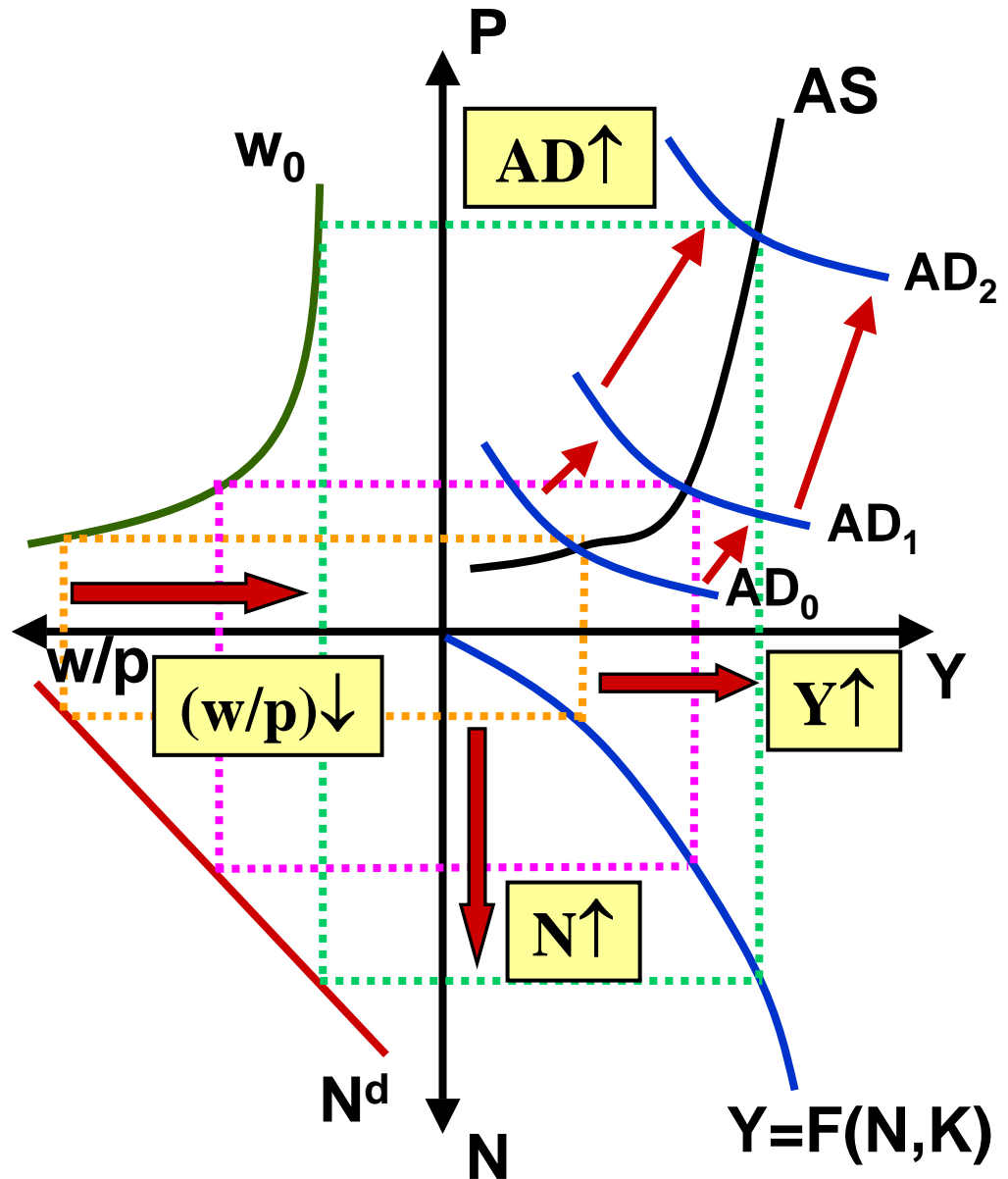
- **Institutional factors:**
 - Workers often accept **explicit or implicit contracts** for employment, accepting that they will not be re-evaluated for nominal wage changes for an extended period.
 - This leads to a **contractual view** of the labor market.

AS from IS-LM



NOTES:

1. Employment and output result from AD increases.
2. That is, labor demand is *derived demand*. Firms employ labor based upon conditions in the aggregate goods and services market.
3. As prices rise, the real wages fall, making labor more attractive.
4. As more workers are employed, output increases.



The Keynesian Model: *Summary*

$$LM: M_0 = L(Y, r)$$

$$IS: I(r) + G_0 = S(Y - T_0) + T_0$$

$$IS = LM \Rightarrow I^*, S^*, M^*, Y^*, r^*$$

$$C^* = C(Y - T_0)$$

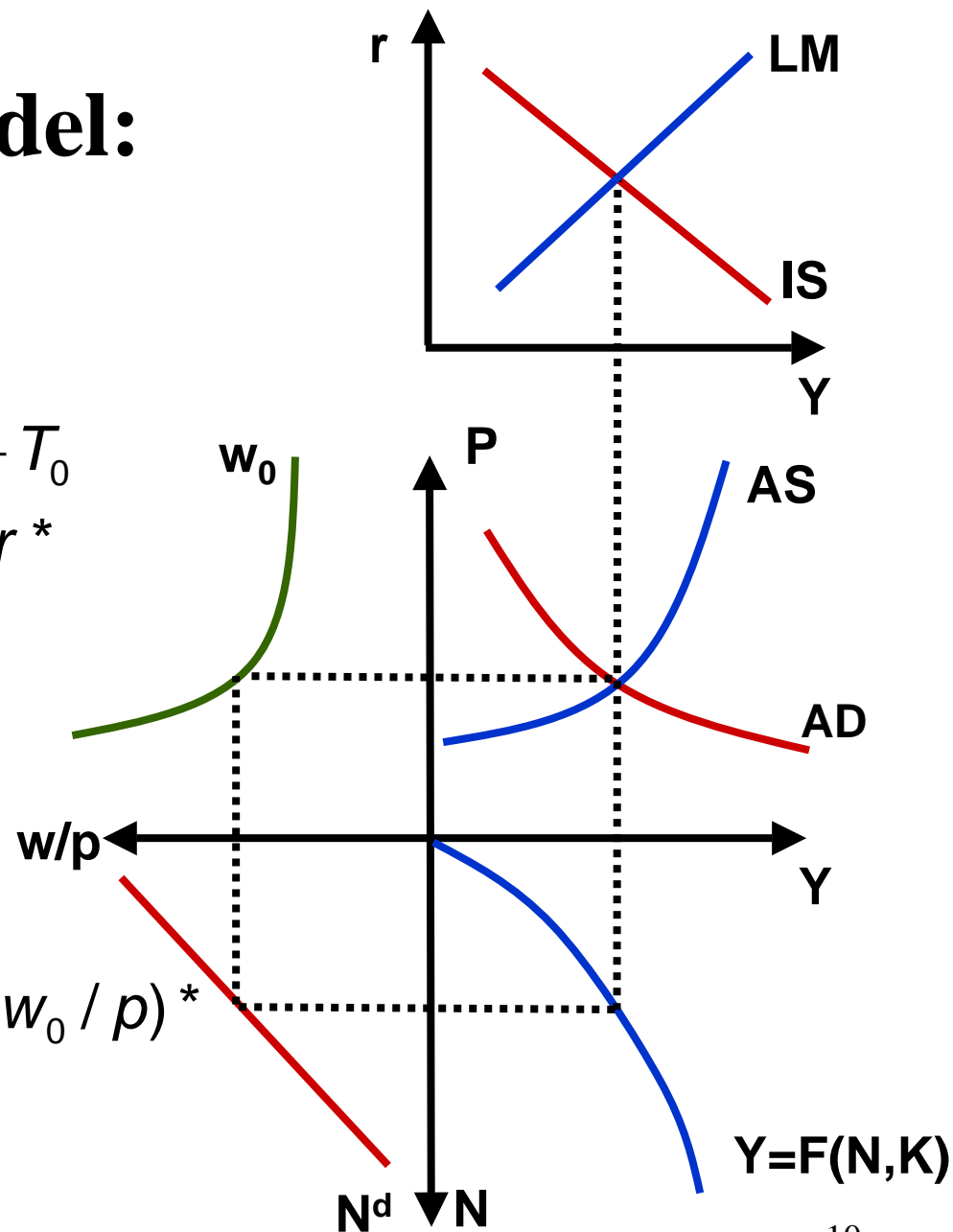
$$AD = C + I + G_0$$

$$AS = Y^*$$

$$N^{d*} = F^{-1}(Y^*, K_0)$$

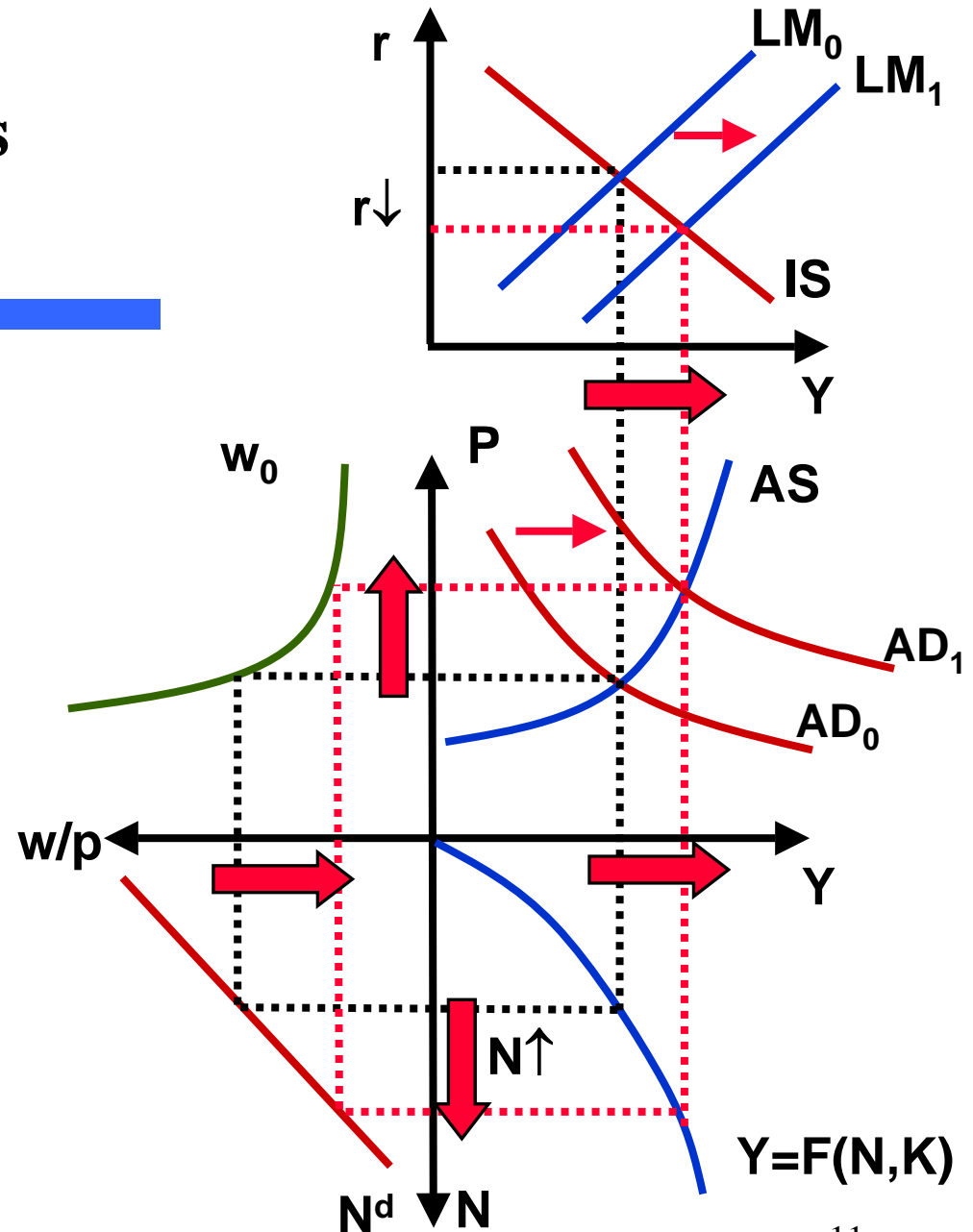
$$N^s = N^s(w_0 / p) = N^{d*} \Rightarrow (w_0 / p)^*$$

$$\frac{w_0}{w_0 / P} = P^*$$



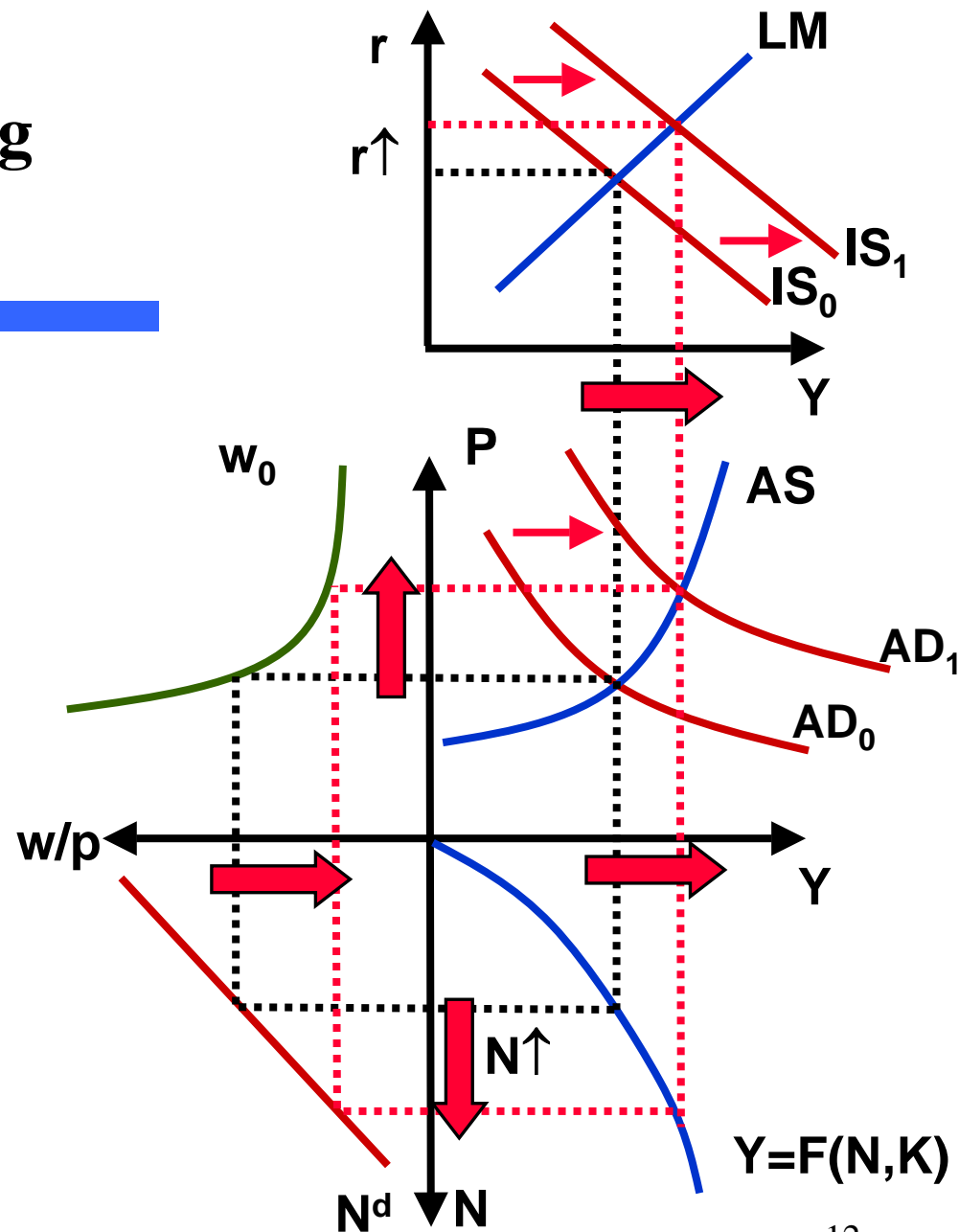
Policy: Fed Increases the Money Supply

1. LM Curve is shifted to the right (neg. intercept is increased)
2. Interest rates fall, stimulating the interest-sensitive sectors of the economy. AD rises (shifts to right).
3. Firms see higher prices, increased demand, and lower real wages, so they increase output by increasing employment.
4. Nominal wages do not change.



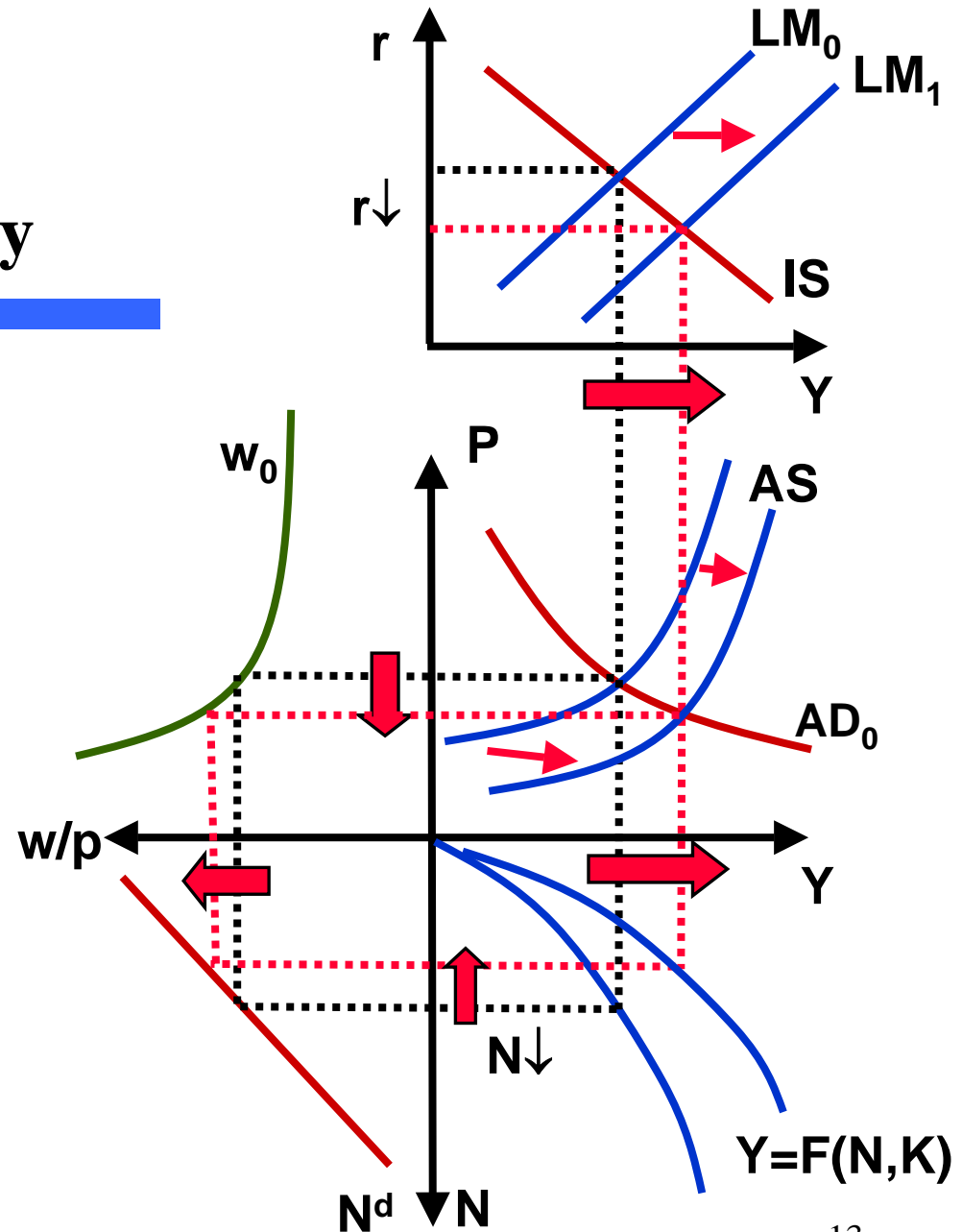
Policy: Increase in Government Spending (no Tax Increase)

1. IS Curve is shifted to the right. Interest rates rise.
2. $AD = C + I + G$ rises (shifts to right).
3. Firms see higher prices, increased demand, and lower real wages, so they increase output by increasing employment.
4. Nominal wages do not change.

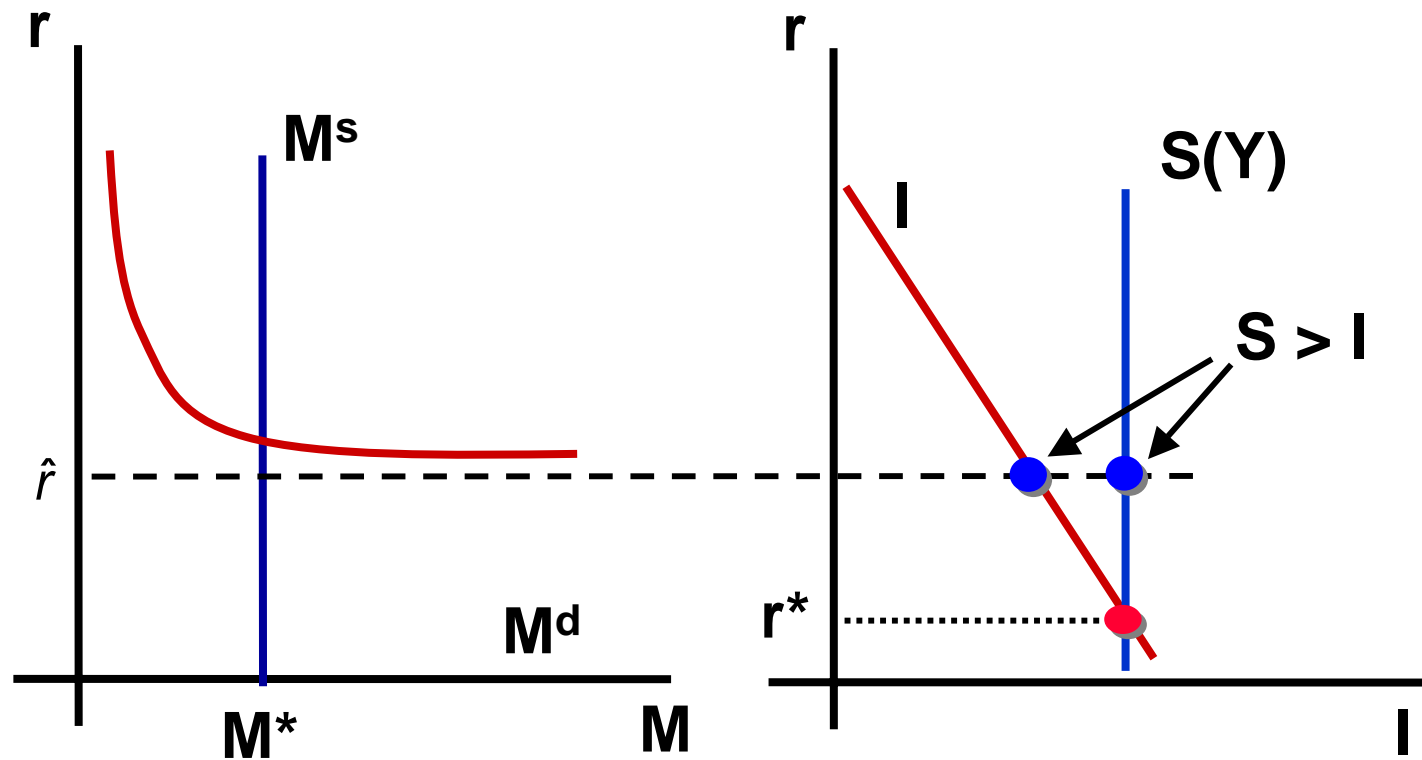


Aggregate Supply: Improvement in Production Technology

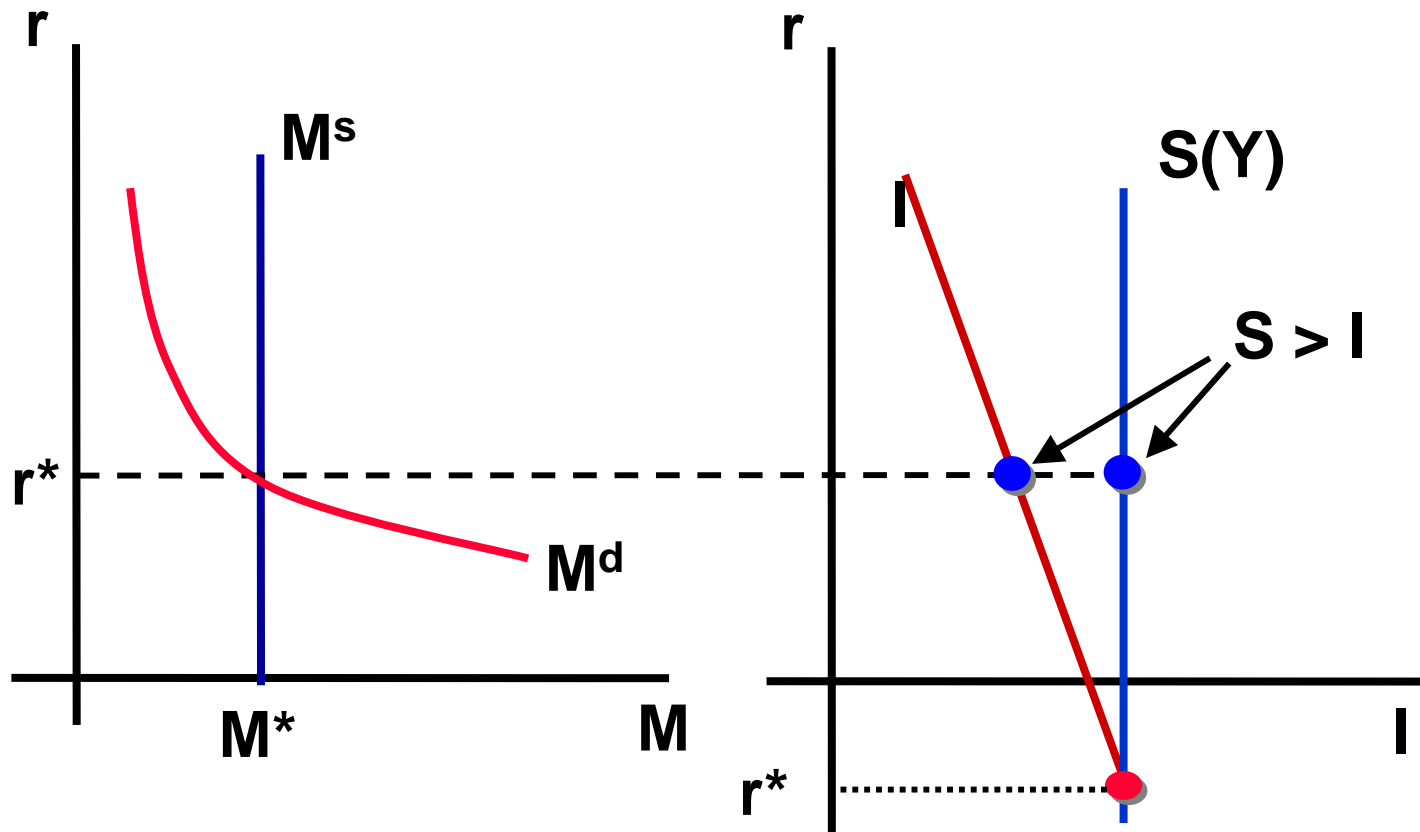
1. Production function swings outward, shifting AS curve to the right.
2. Aggregate price level falls, real money supply increases, so LM Curve is shifted to the right (neg. intercept is increased)
3. Firms see higher real wages and increased productivity, so they decrease employment.
4. Nominal wages do not change.



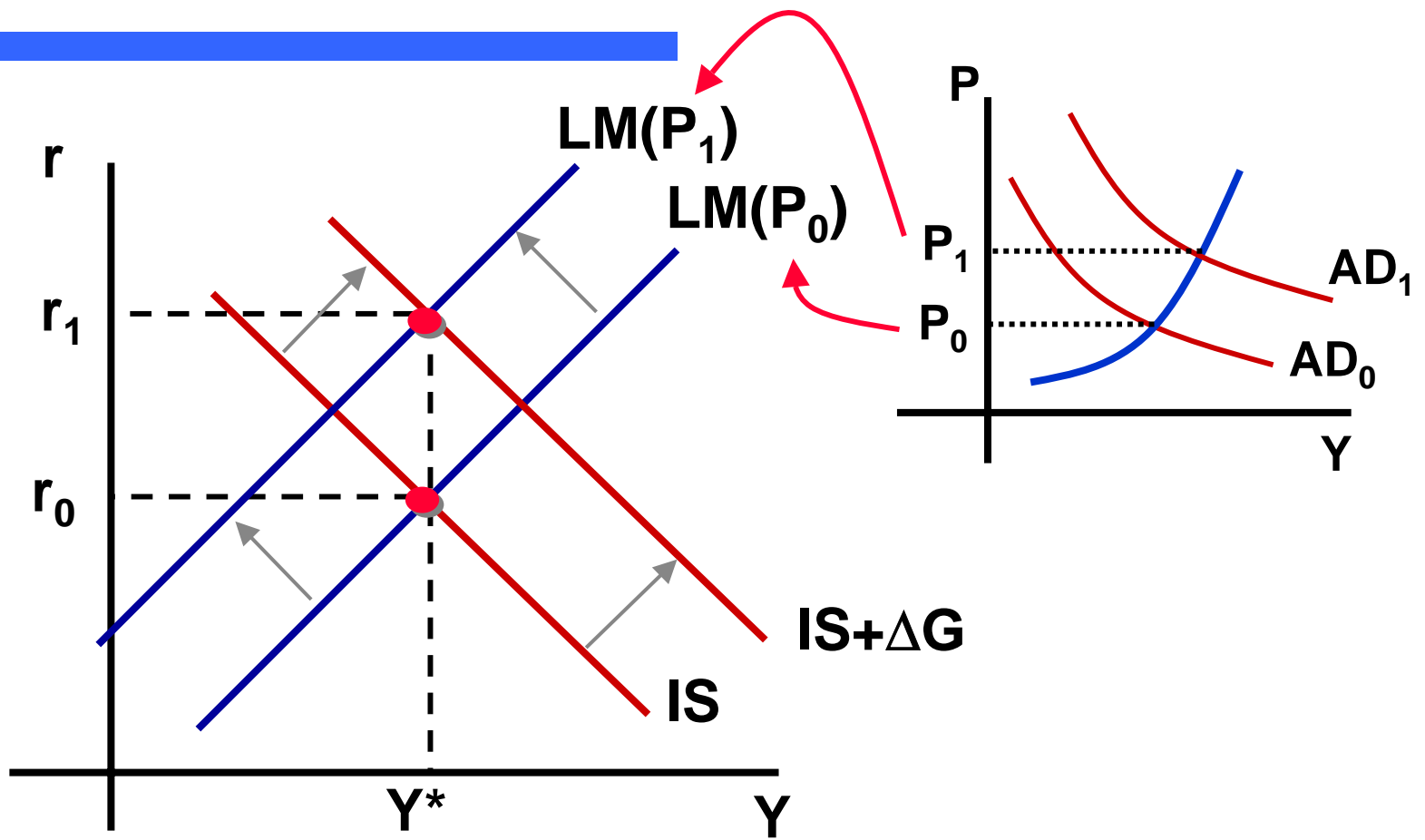
Liquidity Trap



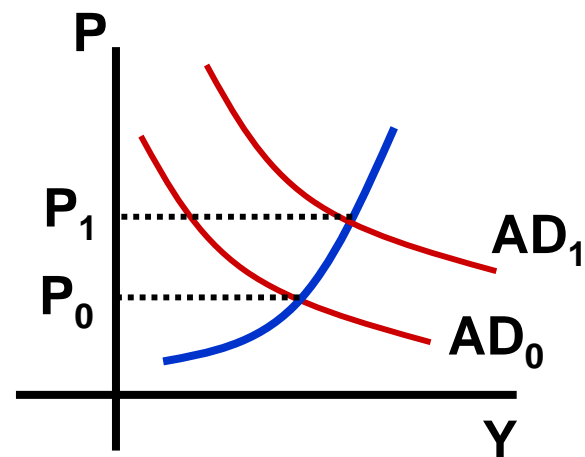
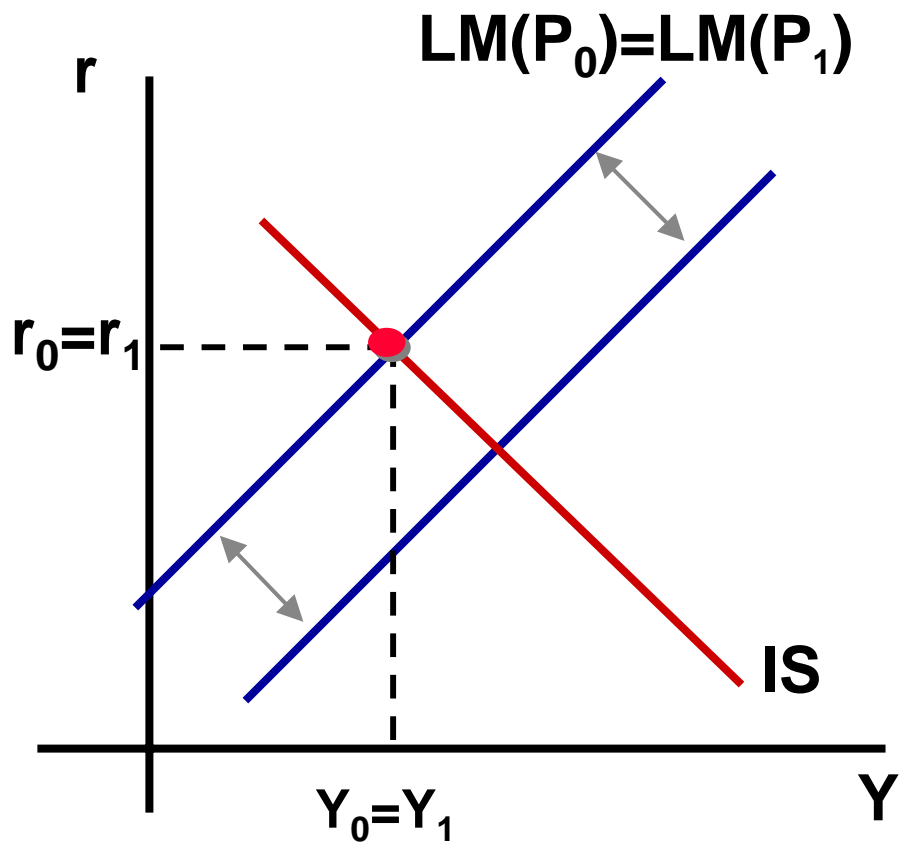
Investment Trap



Real Balance Effects (Pigou)



Real Balance Effects (Pigou)



$IS+\Delta G$

$$\frac{M_0}{P_0} = \frac{M_1}{P_1}$$