

AP Macroeconomics

Required Graphs & Their Shifters

Nine exam-required models, accurately drawn and colour-coded, each shown shifting and paired with its complete set of shifters.

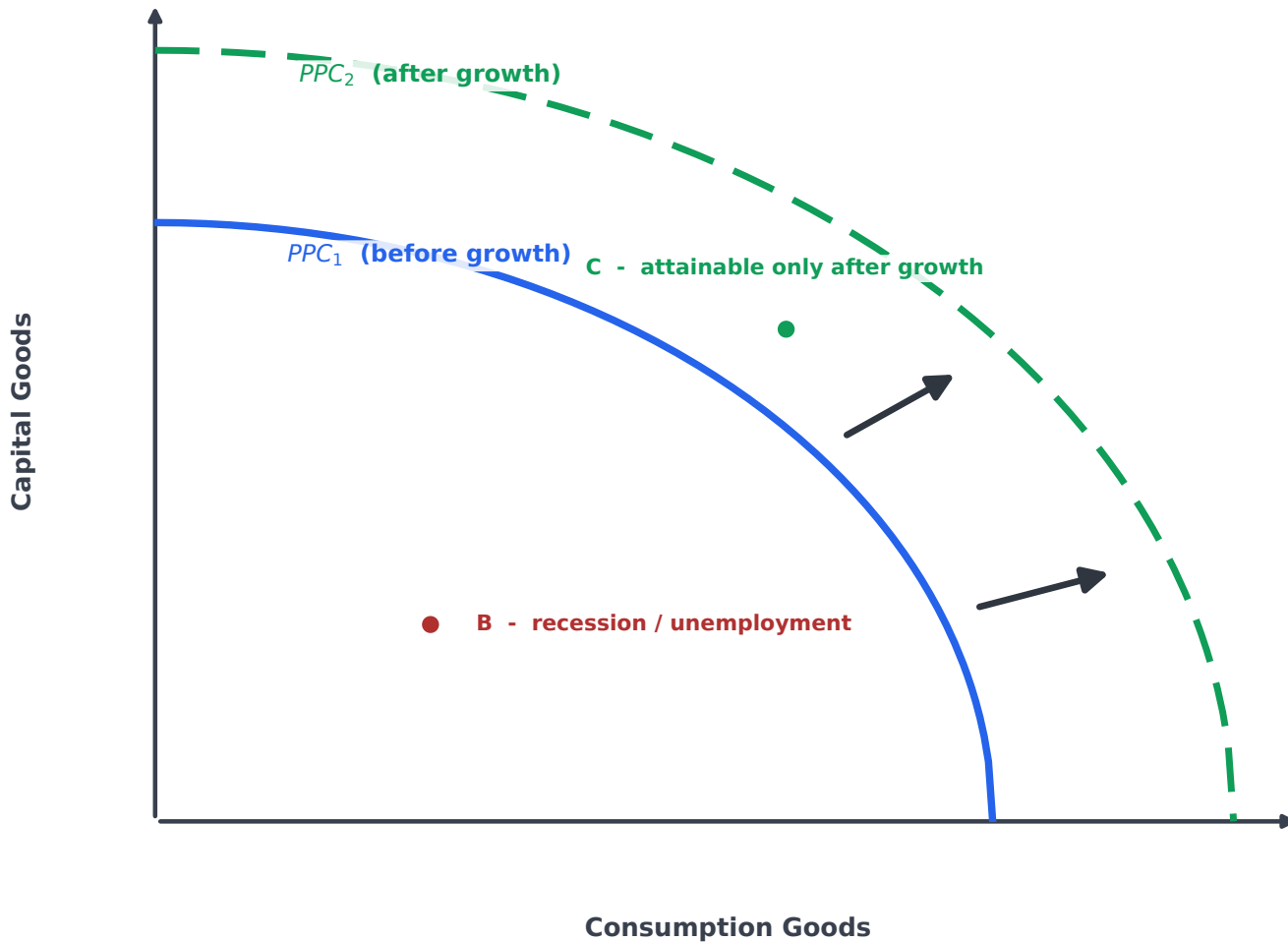
GRAPHS IN THIS REFERENCE

1. Production Possibilities Curve
2. Demand & Supply
3. Aggregate Demand - Aggregate Supply (AD-AS)
4. The Money Market
5. The Reserve Market
6. The Loanable Funds Market
7. The Phillips Curve
8. The Foreign Exchange Market
9. The Aggregate Production Function

Every graph is drawn from the College Board Course and Exam Description (CED), Appendix: Graphs and Visuals. Each page pairs an accurate, colour-coded diagram - shown shifting - with the complete list of shifters.

Production Possibilities Curve

Shift shown: economic growth pushes the entire curve outward



Shifters of the Production Possibilities Curve

Shifts OUTWARD -> (economic growth)

- ▶ Increase in the QUANTITY of resources - land, labour, capital, entrepreneurship
- ▶ Increase in the QUALITY of resources - human capital, education, training
- ▶ Advances in technology
- ▶ Producing more capital goods today (raises future productive capacity)

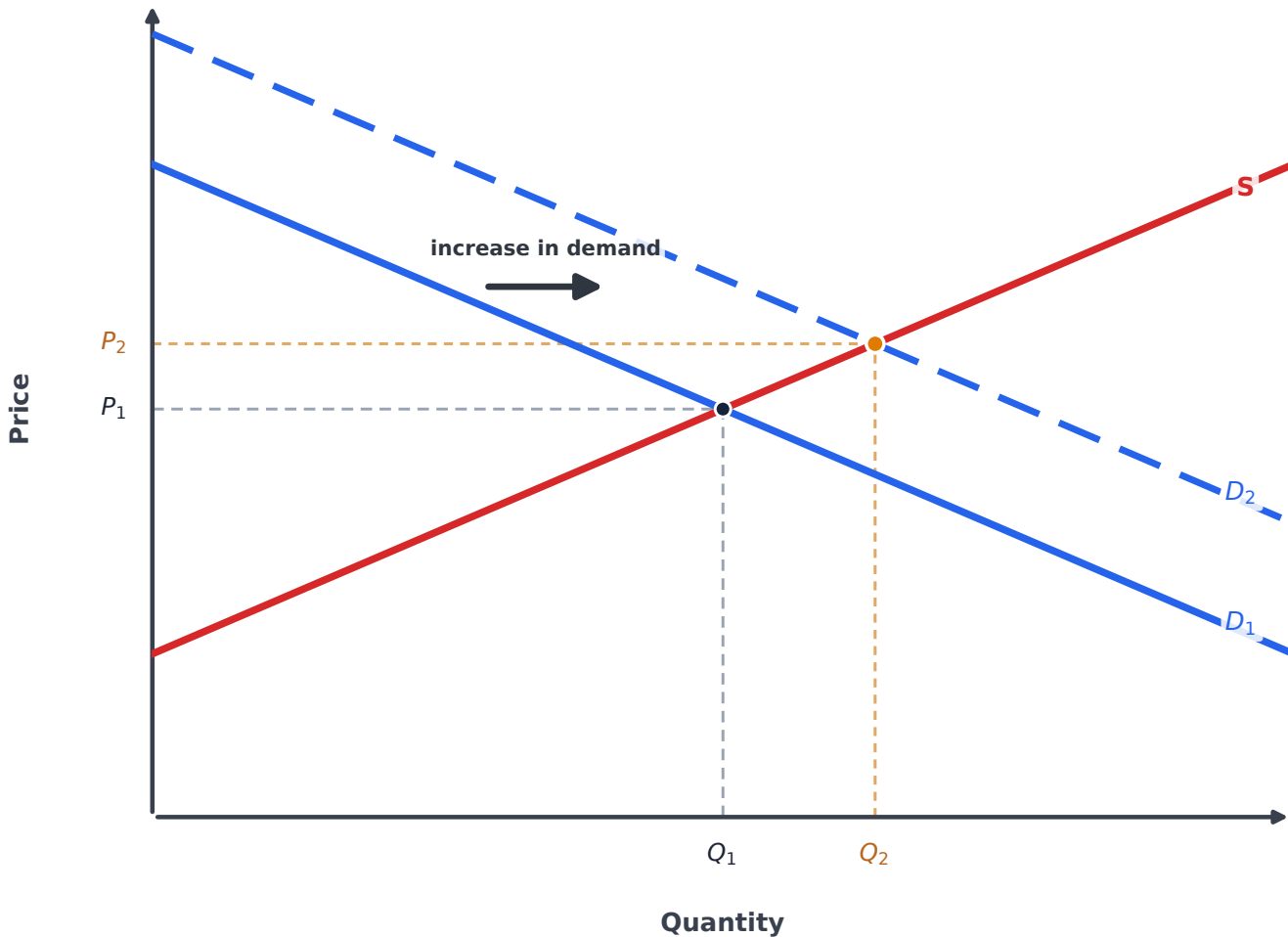
Shifts INWARD <-

- ▶ War, conflict, or natural disasters
- ▶ Depletion or loss of resources
- ▶ Decline or shrinkage of the labour force

KEY ▶ A point inside the curve = recession / unemployed resources; a point outside = currently unattainable. The PPC and the LRAS curve shift outward together.

Demand & Supply

Shift shown: an increase in demand raises both price and quantity



Shifters of Demand & Supply

Demand shifters · "TIPEN"

- ▶ Tastes and preferences of buyers
- ▶ Income - normal good: more income shifts D right; inferior good: D left
- ▶ Prices of related goods - substitutes and complements
- ▶ Expectations of buyers about future price or income
- ▶ Number of buyers in the market

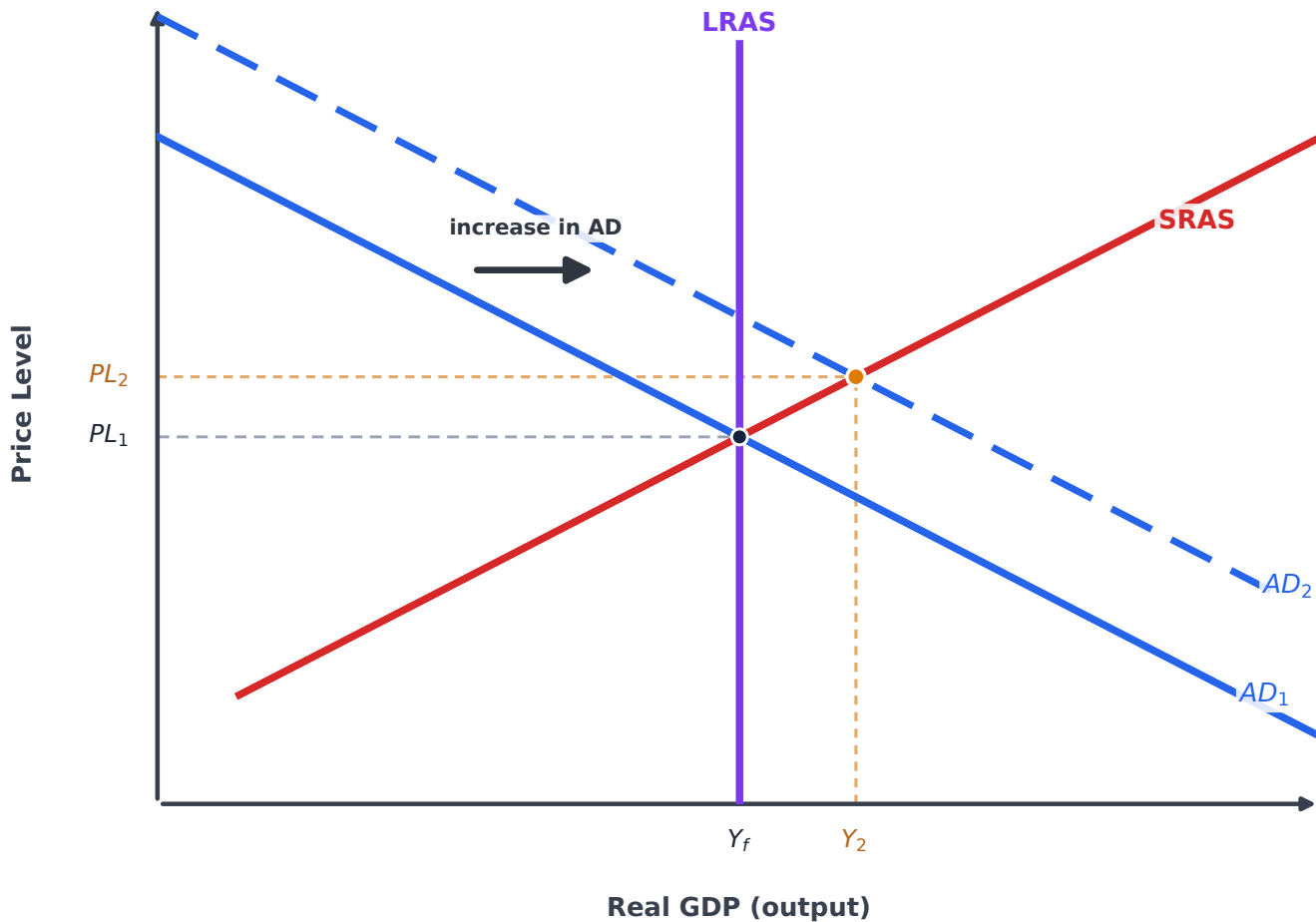
Supply shifters · "ROTTEN"

- ▶ Resource and input costs (higher costs shift S left)
- ▶ Prices of Other goods the firm could produce
- ▶ Taxes (shift S left) and subsidies (shift S right)
- ▶ Technology and productivity improvements (shift S right)
- ▶ Expectations of sellers
- ▶ Number of sellers in the market

KEY ▶ A change in the goods own price is a movement *ALONG* the curve, never a shift.

Aggregate Demand - Aggregate Supply

Shift shown: an increase in AD opens an inflationary gap in the short run



Shifters of AD, SRAS and LRAS

Aggregate Demand (AD)

- ▶ C - consumer wealth, confidence, expected income, taxes, interest rates, debt
- ▶ I - real interest rates, business confidence, business taxes, technology
- ▶ G - government spending
- ▶ Xn - exchange rates, foreign income, trade policy

Short-Run AS (SRAS)

- ▶ Input and resource prices (especially nominal wages)
- ▶ Productivity
- ▶ Business taxes, subsidies and regulation
- ▶ Inflationary (price-level) expectations
- ▶ Supply shocks - energy, weather

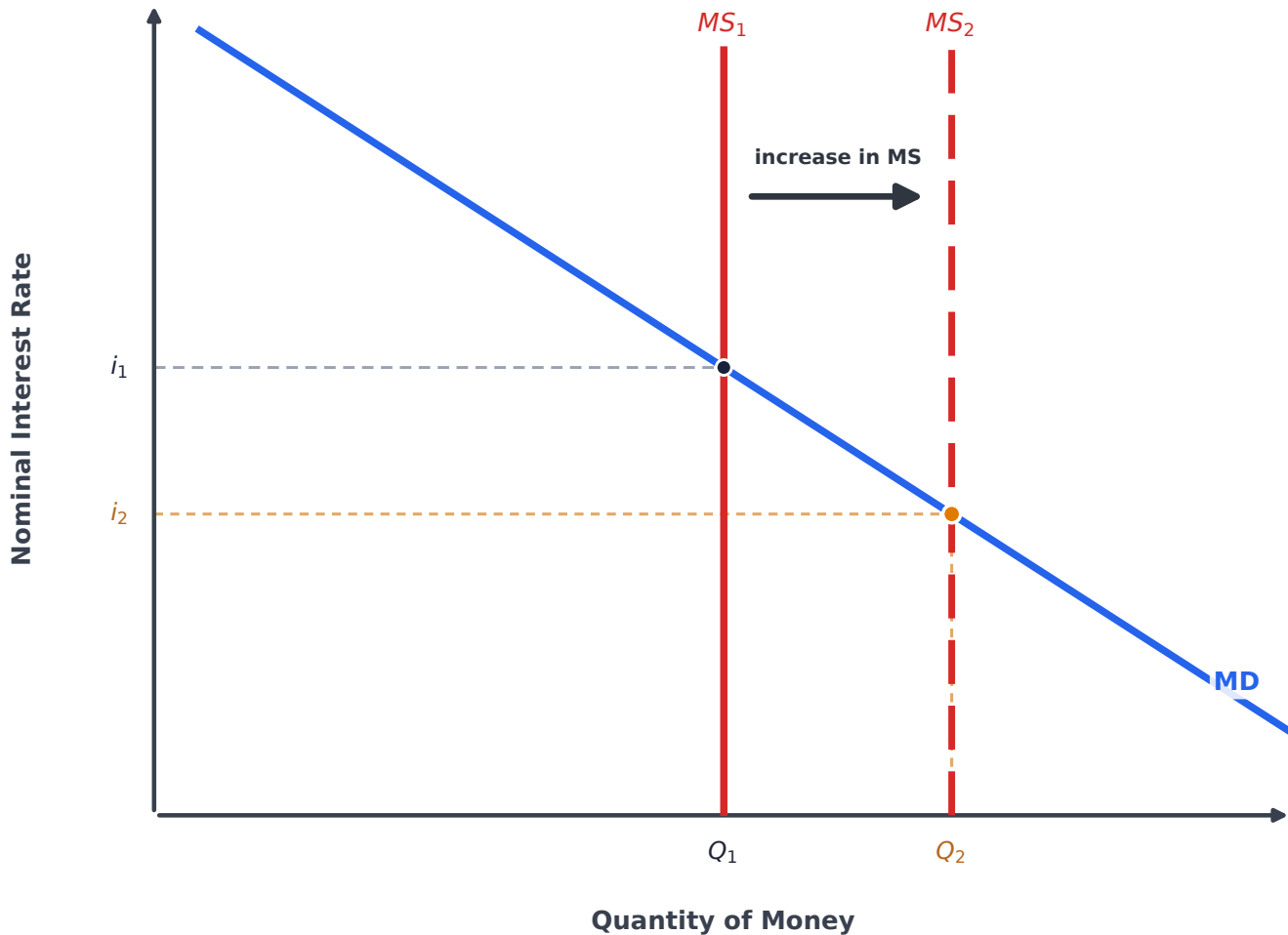
Long-Run AS (LRAS) · "TLCNI"

- ▶ Technology
- ▶ Labour - quantity and quality
- ▶ Capital stock
- ▶ Natural resources
- ▶ Institutions and incentives

KEY ▶ Long-run equilibrium is where AD, SRAS and LRAS all meet at full-employment output. AD and SRAS crossing LEFT of full employment = recessionary gap; crossing to the RIGHT = inflationary gap (shown here).

The Money Market

Shift shown: an increase in the money supply lowers the interest rate



Shifters of the Money Market

Money SUPPLY (MS) - set by the central bank

- ▶ Open-market operations: buying bonds shifts MS right, selling shifts it left
- ▶ Lowering the discount rate shifts MS right; raising it shifts MS left
- ▶ Lowering the reserve requirement shifts MS right; raising it shifts MS left

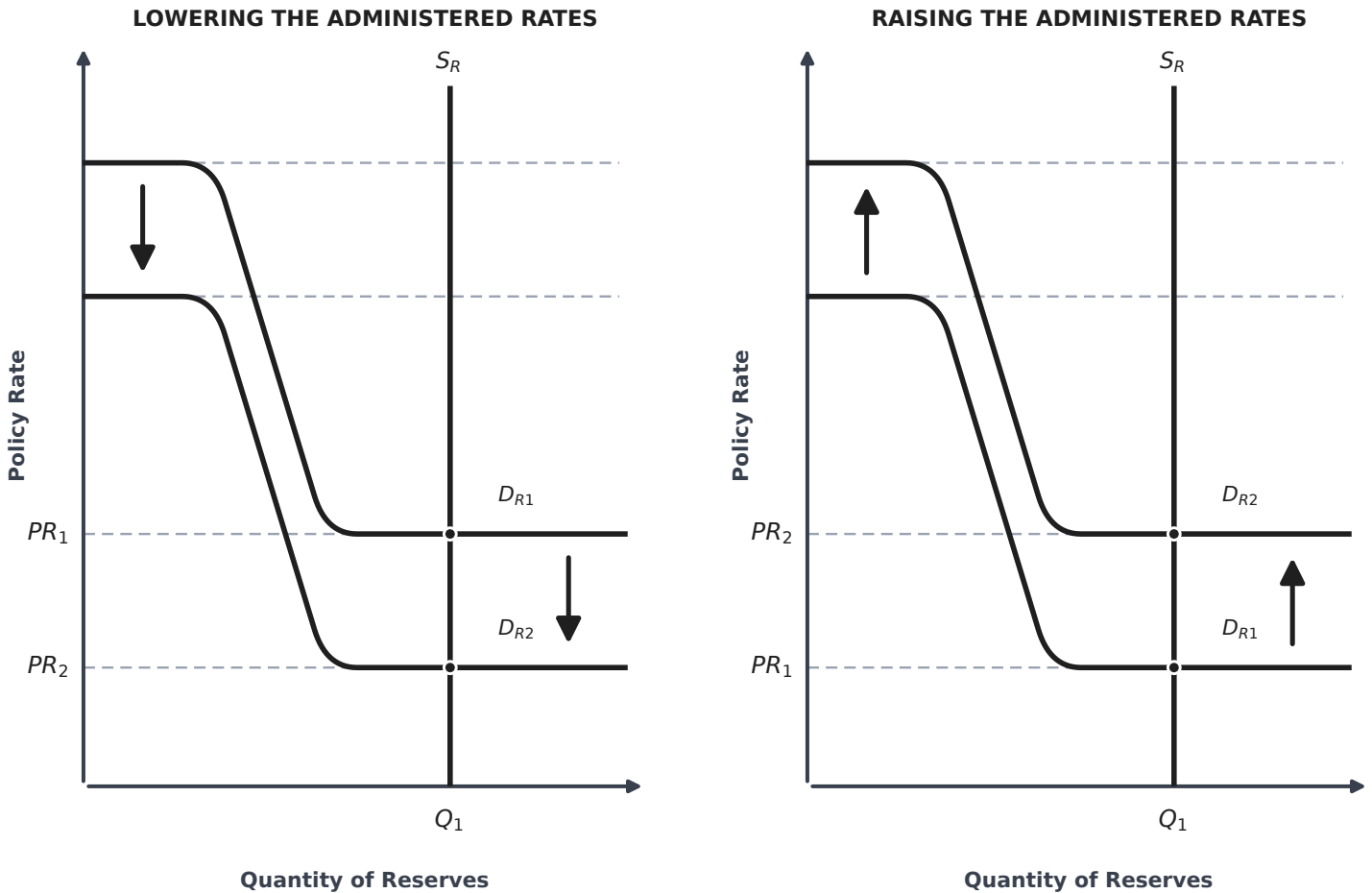
Money DEMAND (MD)

- ▶ Price level - a higher price level shifts MD right
- ▶ Real GDP or income - higher output shifts MD right
- ▶ Changes in payment technology and institutions

KEY ▶ MS is vertical (the central bank sets the quantity). A change in the nominal interest rate is a movement *ALONG* MD, not a shift. More MS lowers the rate.

The Reserve Market

Lowering the administered rates lowers the policy rate; raising them lifts it



Shifters of the Reserve Market

Supply of reserves - the central bank

- ▶ Set by the central bank through open-market operations
- ▶ Buying securities adds reserves and shifts supply right
- ▶ Selling securities drains reserves and shifts supply left

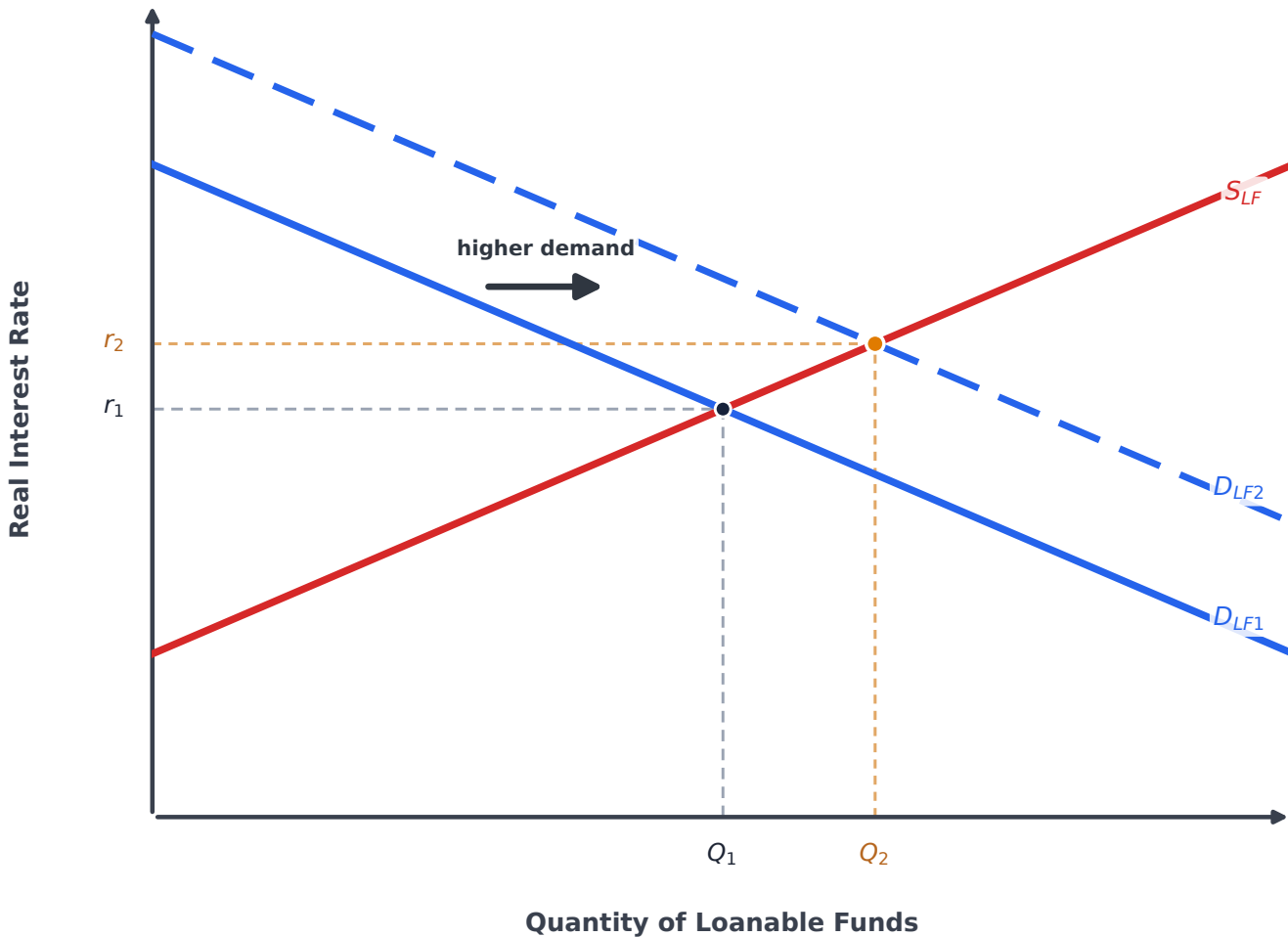
Policy rate & demand for reserves

- ▶ In ample reserves the central bank sets the policy rate with administered rates
- ▶ Interest on reserve balances (IORB) is the floor of reserve demand
- ▶ The discount rate is the ceiling of reserve demand
- ▶ Lowering the administered rates shifts demand down; raising them shifts it up

KEY ▶ With ample reserves the policy rate sits where supply crosses demand on its flat (IORB) portion. The central bank moves the policy rate by raising or lowering the administered rates.

The Loanable Funds Market

Shift shown: a government deficit raises demand and the real interest rate



Shifters of the Loanable Funds Market

Demand for loanable funds (borrowing)

- ▶ Business confidence and the expected return on investment
- ▶ Technology and new investment opportunities
- ▶ Business taxes and investment tax credits
- ▶ Government borrowing - a budget deficit shifts demand right

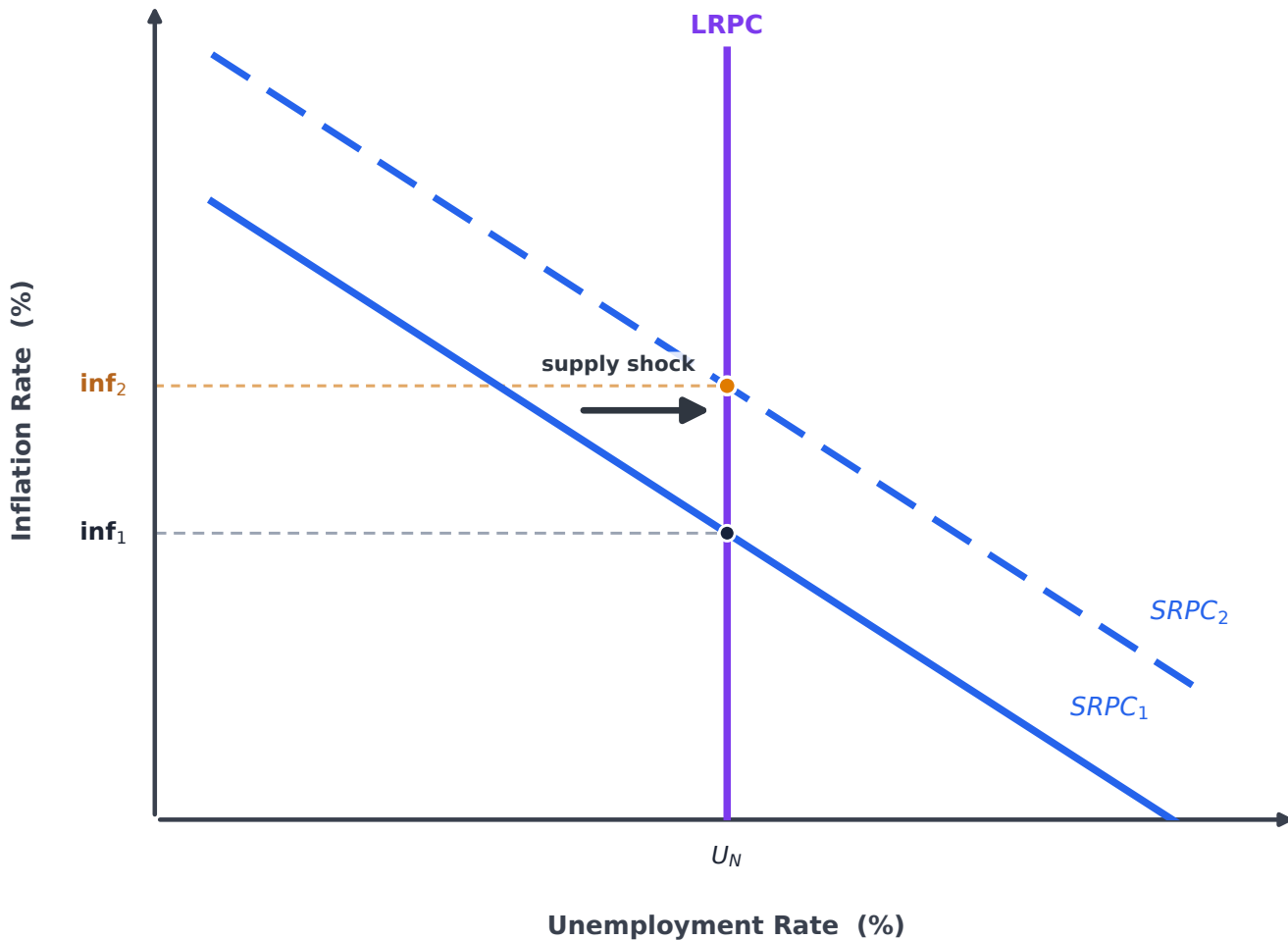
Supply of loanable funds (saving)

- ▶ Private saving behaviour and disposable income
- ▶ Expected future income and consumer confidence
- ▶ Government budget - a deficit shifts supply left, a surplus shifts it right
- ▶ Capital inflows from abroad

KEY ▶ A government budget deficit raises the real interest rate and crowds out private investment ("crowding out").

The Phillips Curve

Shift shown: an adverse supply shock shifts the short-run curve outward



Shifters of the Phillips Curve

Short-Run Phillips Curve (SRPC)

- ▶ Changes in inflationary expectations
- ▶ Supply shocks and input-price changes (the same factors that shift SRAS, in the opposite direction)
- ▶ A change in the natural rate of unemployment

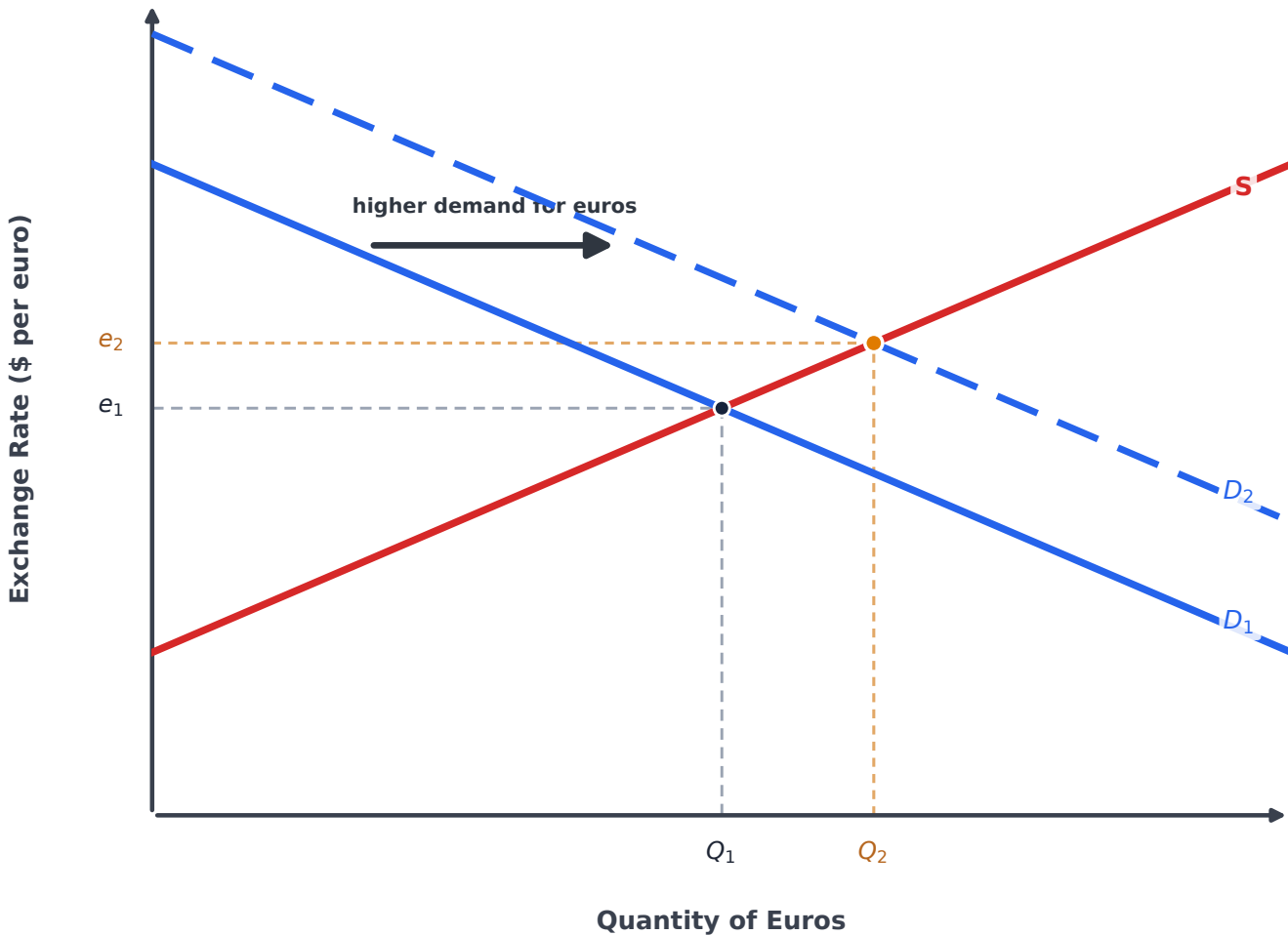
Long-Run Phillips Curve (LRPC)

- ▶ Vertical at the natural rate of unemployment
- ▶ Shifts only when the natural rate changes - structural and frictional unemployment, labour-market policy, demographics
- ▶ Moves with the same factors that shift LRAS

KEY ▶ A movement *ALONG* the SRPC corresponds to a change in AD. A supply shock shifts the SRPC itself, worsening the inflation-unemployment trade-off (shown here).

The Foreign Exchange Market

Shift shown: stronger demand for the currency causes it to appreciate



Shifters of the Foreign Exchange Market

Demand for the currency (rise = appreciation)

- ▶ Stronger foreign demand for this country exports
- ▶ Higher relative interest rates here, attracting capital inflows
- ▶ Higher relative income abroad
- ▶ Lower relative inflation here
- ▶ Expectation that the currency will appreciate

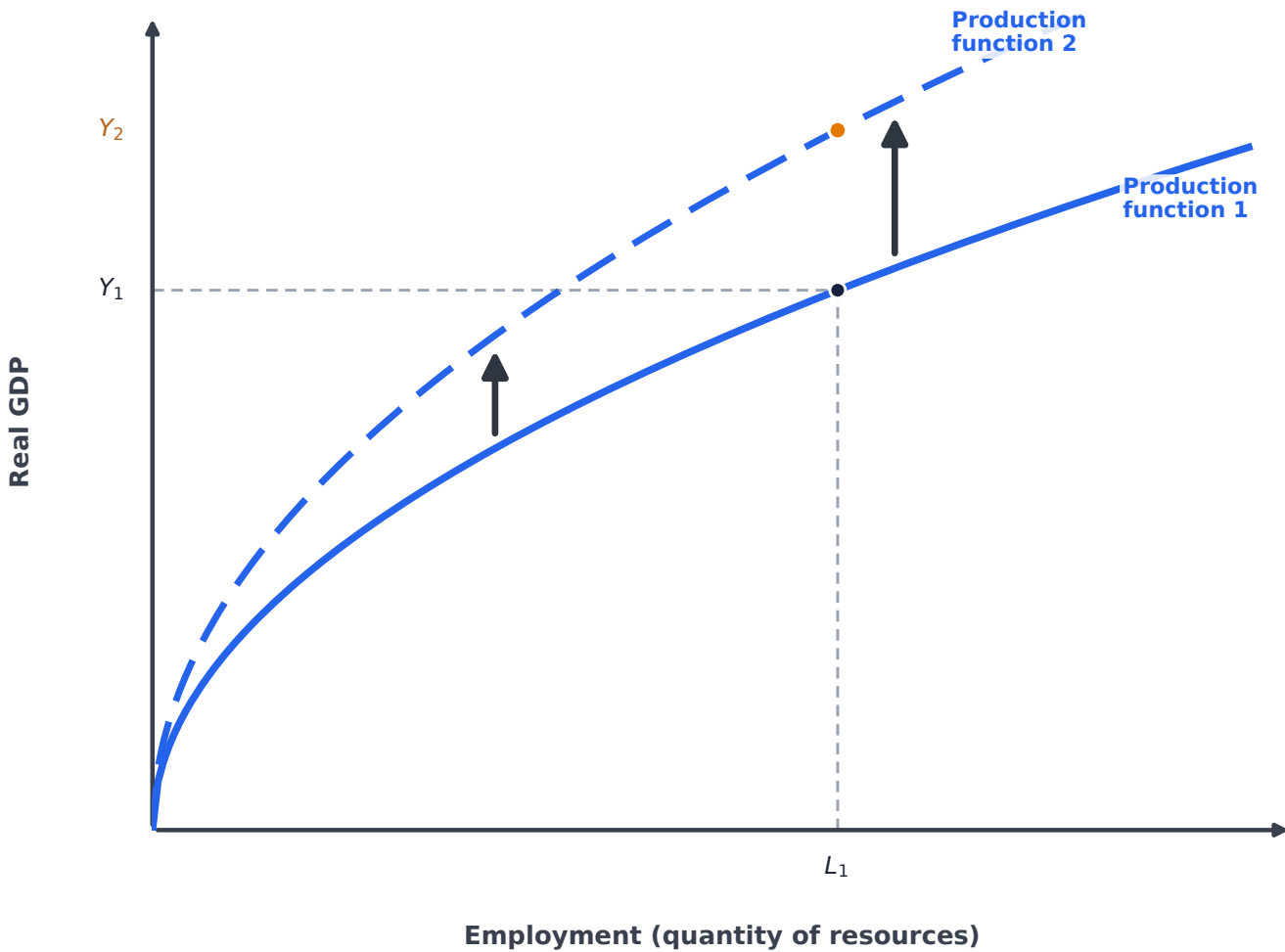
Supply of the currency (rise = depreciation)

- ▶ Stronger demand here for foreign imports
- ▶ Higher relative interest rates abroad, sending capital outflows
- ▶ Higher relative income here
- ▶ Higher relative inflation here
- ▶ Expectation that the currency will depreciate

KEY ▶ Demand and supply use the same factors in mirror image. If one currency appreciates, the other must depreciate.

The Aggregate Production Function

Shift shown: better technology lifts output at every level of employment



Shifters of the Aggregate Production Function

What shifts the production function upward

- ▶ Advances in technology
- ▶ More physical capital per worker
- ▶ More human capital - education, training, health
- ▶ Increases in the quantity or quality of resources
- ▶ Better institutions and incentives

KEY ▶ The curve flattens as employment rises - diminishing returns to the variable input. The same factors shift the LRAS curve and the PPC outward.