

Asset Allocation

Capital Market Expectations, Part 1: Framework and Macro Considerations



Exam Focus

- Challenges in developing capital market forecasts
- Applying economic growth trend analysis
- Comparing major approaches to economic forecasting
- How business cycles affect capital market expectations
- Inflation, monetary and fiscal policy, and exchange rates
- Shape of the yield curve as an economic predictor

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Formulating Capital Market Expectations

Seven steps

1. Allowable asset classes, investment horizon(s)
2. Investigate assets' historical performance
3. Identify valuation model to be used
4. Collect best data; avoid faulty conclusions
5. Interpret current investment conditions
6. Formulate capital market expectations
7. Monitor performance and use to refine process

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Problems in Forecasting

Nine problems

1. Data time lags, and data and methodology revisions
2. Measurement errors/biases: transcription errors
3. Limitations of historical estimates (regime changes)
4. Use ex post data to calculate ex ante risk/return
5. Data mining and time period bias
6. Fail to account for conditioning information
7. Misinterpretation of correlations
8. Psychological biases (e.g., anchoring, status quo)
9. Model uncertainty (e.g., parameters, inputs)

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Trend Rate of Growth

Growth in Real GDP

- Distinguish between exogenous vs. endogenous shocks
- Exogenous caused by government policy changes, political events, technological progress, etc.
- Exogenous shocks can disrupt the trend rate (e.g., oil price increase leading to high inflation)
- Higher trend growth rates may lead to higher equity returns
→ may increase government bond yields
- High growth rates in capital investments may not result in higher equity returns because if $g_{\text{capital}} > g_{\text{economic}}$ then ROC and equity returns may fall

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Trend Rate of Growth

Basic model to forecast economic growth rate

- Labor input + capital per worker + total factor productivity (TFP)
- Labor input = population growth + labor force participation growth
- Capital per worker = spending on new capital inputs
- TFP (residual) = technological progress and government policy changes

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Approaches to Economic Forecasting

Econometric modeling

- Formal and mathematical; complex
- Basic forms: structural and reduced form
- Subject to estimation errors

Economic indicators

- Leading: most useful; move ahead of business cycle with stable lead time
- Coincident: reflect current economic activity
- Lagging: reflect recent past

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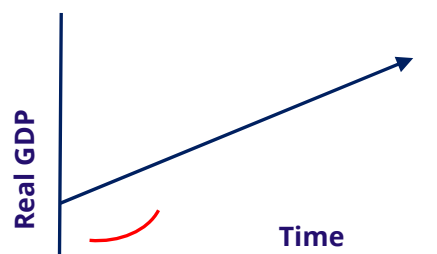
Approaches to Economic Forecasting

Checklist

- The most subjective and limited in complexity
- Considers a series of questions
- Analyst uses judgment and possibly some statistical modeling to interpret the answers and formulate a forecast

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The Business Cycle: Initial Recovery

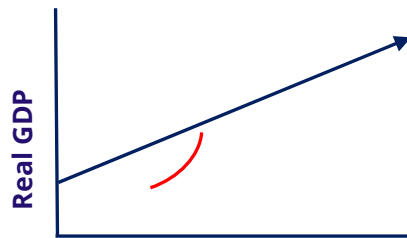


Economy exits recession:

- Government policy stimulative
 - Consumer confidence improving
 - Inflation initially declining
-
- ST rates low or declining
 - LT rates bottoming and bond prices peaking
 - Stocks do well in anticipation of economic recovery

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The Business Cycle: Early Expansion



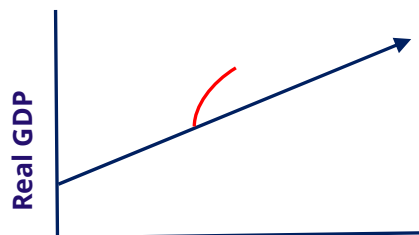
Economy grows faster than trend:

- Output gap shrinks
- Policy turns less stimulative
- Consumer confidence increasing
- Inflation low

- ST rates increasing
- LT rates bottoming or increasing; bond prices start to decline
- Stock prices increasing

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The Business Cycle: Late Expansion



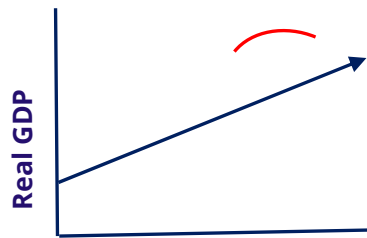
GDP above trend, but growth slowing:

- Policy becoming restrictive
- Consumer confidence excessive
- Inflation increasing

- ST rates increasing
- LT rates increasing with bond prices declining
- Stock prices volatile and topping out

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The Business Cycle: Slowdown



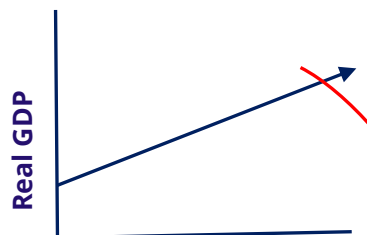
GDP still above trend, but growth rate below trend:

- Policy becoming more neutral
- Consumer confidence peaking
- Inflation continues to accelerate

- ST rates peaking and then declining
- LT rates high and then declining; bond returns favorable
- Stock prices declining in anticipation of recession

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The Business Cycle: Contraction



Recession formally defined as two consecutive quarters of negative real growth:

- Output gap increasing
- Policy easing
- Consumer confidence weak

- Inflation peaking
- ST and LT rates declining; bonds do well
- Stock prices increase later in the recession

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Inflation Implications

Inflation

- Rising prices (e.g., CPI rises from 100 to 105 = +5% inflation)

Disinflation

- Deceleration in inflation rate
(e.g., CPI rises from 105 to 108 = inflation decreases to 3%)

Deflation

- Falling prices (e.g., CPI declines from 108 to 106 = -2% inflation)

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Inflation and Asset Classes

Inflation within expectations

- Cash: earn real rate of interest
- Bonds: ST yields rise/fall more than LT yields
- Equity: no impact, given predictable economic growth
- Real estate: neutral with typical returns

Inflation above expectations

- Cash: does well with increasing yield
- Bonds: does poorly as prices decline
- Equity: does poorly, except companies able to pass through inflation in product prices
- Real estate: does well as asset values increase

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Deflation and Asset Classes

Deflation

- Cash: low return with approximately 0% interest rate (but gains real purchasing power value)
- Bonds: attractive as future cash flows have greater purchasing power (assuming no default)
- Equity: does poorly with declining economic activity and asset values
- Real estate: does poorly with declining property values

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Government Policy

Monetary

- Stimulative: money supply ↑, ST rates ↓
- Contractionary: money supply ↓, ST rates ↑
- ST rates indirectly affect LT rates

Fiscal

- Stimulative: deficit ↑
- Contractionary: deficit ↓
 - Budget deficit = $G - T$
- Policy changes to the deficit have more impact than cyclical fluctuations

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Question: The Taylor Rule

Policy neutral rate	3.50%
Inflation target	2.00%
Consensus expected inflation	6.00%
GDP long-term trend	3.00%
Consensus expected GDP	1.00%

Assume that the central bank uses consensus estimates to determine monetary policy, and an analyst expects inflation and GDP growth to be 4% and 0%. **State** and **justify** what the analyst believes will be the change in monetary policy.

Question: The Taylor Rule

State and **justify** what the analyst believes will be the change in monetary policy.

- Become more stimulative
- Lower growth calls for, and lower inflation allows, the money supply for

Current rate target

- Real: $3.5\% + 0.5(6\% - 2\%) + 0.5(1\% - 3\%) =$
- Nominal: $6\% + 4.5\% =$

Analyst estimate

- Real: $3.5\% + 0.5(4\% - 2\%) + 0.5(0\% - 3\%) =$
- Nominal: $4\% + 3\% =$

Negative Interest Rates

Negative Rates

- They are likely associated with deflation and regarded as unsustainable.
- After the 2007–2008 financial crisis, they have persisted.
 - This is despite quantitative easing.
- They complicate economic forecasting. What is the starting point of the buildup model?
 - Use the Taylor rule policy neutral rate.
 - Forecast possible paths to a long-term $+r_f$.
 - Assume that we are in the early recovery stage of the business cycle.

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Economic Policy and the Yield Curve

Fiscal and monetary policy expansive

- Economy should improve
- Yield curve sharply upward sloping

Fiscal and monetary policy restrictive

- Economy should contract
- Yield curve downward sloping

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Global Macroeconomic Links

- A recession in one country tends to depress economic activity in its trading partner countries:
 - Imports decline, reducing exports by trading partners.
 - The recession country reduces investments in its trading partners.
- Larger, more diversified economies are less affected by these links.

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Global Macroeconomic Links

Current account and capital account linkages

- Current account = mainly net exports ($X - M$)
- Capital account = net investment flows
- Surplus in current will produce deficit in other (and vice versa)
- Impact of current account on economic activity:
 - Income = Expenditure
 - $\cancel{C} + S + T = \cancel{C} + I + G + (X - M)$
 - $(X - M) = (S - I) + (T - G)$

Net exports = net private saving + government surplus

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Global Macroeconomic Links

Interest rate/currency linkages

- Countries that peg their currency value must generally follow economic policies of the country to which they peg
- Pegging country interest rates typically exceed those of the country to which they peg
 - Interest rate differential fluctuates with market's degree of confidence in the peg

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Global Macroeconomic Links

In the absence of currency pegs

- If a currency is perceived as overvalued and expected to decline, interest rates will be higher to compensate investors for expected currency decline
- Relative nominal and real bond yields are increased by strong economic activity
 - Theory that real rates converge is not well supported

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Solutions

Solution: The Taylor Rule

State and **justify** what the analyst believes will be the change in monetary policy.

- Become more stimulative (expansionary)
- Lower growth calls for, and lower inflation allows, increasing the money supply for lower rates

Current rate target

- Real: $3.5\% + 0.5(6\% - 2\%) + 0.5(1\% - 3\%) = 4.5\%$
- Nominal: $6\% + 4.5\% = 10.5\%$

Analyst estimate

- Real: $3.5\% + 0.5(4\% - 2\%) + 0.5(0\% - 3\%) = 3.0\%$
- Nominal: $4\% + 3\% = 7\%$

Capital Market Expectations, Part 2: Forecasting Asset Class Returns



Exam Focus

- Setting expectations for fixed-income returns.
- Country risk analysis of emerging market fixed-income securities
- Setting expectations for equity investment market returns
- Economic and competitive factors driving real estate returns
- Approaches to forecasting exchange rates and volatility

Formal Tools

Formal tools include the following:

- Statistical methods
 - Sample statistics, shrinkage estimation, time series estimation
- Discounted cash flow models
 - Intrinsic value = PV of future cash flows
- Risk premium (or buildup) model
 - Risk-free rate + priced risks

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Surveys and Judgment

- **Surveys:** a poll of market participants' (e.g., economists and analysts) expectations for the economy or capital market
- **Judgment:** analyst applies own views

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Forecasting Fixed Income Returns

Discounted cash flow (DCF) method

- Initial YTM is the best estimate for expected bond return unless given more information
- YTM is an IRR calculation, and all IRR calculations implicitly assume future cash flows are reinvested at the initial IRR
- Alternative: projected horizon return based on assumptions; covered later in Fixed Income

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Forecasting Fixed Income Returns

Risk premium (or building block) approach

- Real risk-free rate
- Term premium (primarily impacted by inflation uncertainty, recession hedge, supply and demand, business cycles)
- Credit premium (e.g., expected losses, risk of default losses)
- Liquidity premium (e.g., older bonds, lower credit quality, complex structure, infrequent or unknown issuer)

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Emerging Market Bond Risk

- Offer higher return and risk as they “catch up”
- Guidelines for potential investors and warning signs:
 1. Fiscal policy
 - Deficit-to-GDP ratio $> 4\%$
 - Debt-to-GDP ratio $> 70\%$
 2. Insufficient real economic growth, which suggests a slower growing economy
 - Growth $< 4\%$

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Emerging Market Bond Risk

3. An overvalued currency supporting a twin deficit problem financed by foreign borrowing (a budget and current account deficit)
 - Current account deficit $> 4\%$ of GDP
4. Excessive foreign-denominated debt
 - Foreign debt-to-GDP ratio $> 50\%$
 - Debt-to-current account receipts ratio $> 200\%$

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Emerging Market Bond Risk

5. Inadequate short-term liquidity to service foreign debt
Foreign exchange reserves-to-ST debt ratio $< 100\%$
6. Political and legal risks (also for EM equity risk)
 - Weak property rights laws and weak enforcement of contract laws
 - Confiscation of property, nationalization of companies, and corruption
 - Imposition of capital controls

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Forecasting Equity Returns

DCF analysis using Grinold-Kroner model

- Rearrange the Gordon growth DDM
$$E(R) = \text{yield} + \text{growth}$$
- Net share repurchase supplements dividend yield
- Growth is estimated as real + inflation
- If prices are not initially in equilibrium, allow for a repricing effect, $\Delta P/E$

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Grinold-Kroner Model

$$1. \left(\frac{\text{Div}_1}{P_0} - \Delta S \right) = \text{expected income component}$$

Think rather than use the formula: if net shares are repurchased, then ΔS is negative, -- is a + (positive cash flow to investors)

2. $+(i+g)$ = nominal earnings growth component

3. $+\Delta\left(\frac{P}{E}\right)$ = repricing component

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Question: Expected Return

	10-Year Average	Current	Capital Market Expectations
Bond yield	6.2%	3.8%	
Equity return	8.2%	-9.4%	
Inflation	2.8%	2.6%	3.5%
Equity P/E	15.0	14.5	14.0
Income return	2.0%		1.5%
Real earnings growth	6.0%		5.0%

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Question: Expected Return

- **Calculate** the historical equity risk premium using the bond yield + risk premium approach.

Historical return –
historical premium

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Question: Expected Return

- **Calculate** the expected equity return using Grinold-Kroner, assuming no change in shares outstanding.

+ + + () =

Note: $(14/14.5 - 1)$ must be expressed as
-3.45 (-3.45%) to match the % form of the other inputs

- Using your answer, **calculate** the expected equity risk premium.

=

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Equilibrium Approach

Use CAPM to estimate the asset's risk premium, to which the (domestic) R_F is added to give $E(R)$.

For an asset (i) whose market is 100% integrated with the global market (GM):

$$RP_i^G = \rho_{i,GM} \sigma_i \left(\frac{RP_{GM}}{\sigma_{GM}} \right)$$

1. Global market Sharpe ratio (global reward per unit of σ)

3. Diversification reduces priced risk (given market is fully integrated into the global market)

2. Scaled up or down for the total risk of the asset or market

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Equilibrium Approach

For an asset (i) whose market is 0% integrated with the global market (completely segmented, so no diversification benefit):

$$RP_i^S = \sigma_i \left(\frac{RP_i^S}{\sigma_i} \right)$$

Segmented market Sharpe ratio*

For an asset (i) whose market is between these extremes, compute a weighted average of RP^G and RP^S based on the degree of integration. Any provided liquidity premiums should also be added.

*If not told otherwise, assume this is same as global Sharpe ratio

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Example: Equilibrium Approach

Global market (GIM) risk premium	3.5%
σ of the global portfolio	8.5%
σ of the Swiss health care industry	12.0%
σ of the Swiss watch industry	6.0%
Swiss health care, GIM correlation	0.7
Swiss watch, GIM correlation	0.8
Swiss market integration with world market	100%

Question: Expected Return

- Using the international capital asset pricing model (ICAPM) and Singer-Terhaar in particular, **calculate** the expected equity risk premium for the two industries and **recommend** the most attractive from a valuation perspective.

Health care: =

Watch: =

Health care has the risk premium; however, this is compensation for systematic, and it is not possible to conclude which industry is more attractive from this data.

Question: Expected Return

- **Calculate** the expected equity risk premium for the health care industry, assuming the Swiss market is only 80% integrated with the world market.

Health care

Integrated: =
 Segmented: =
 Weighted average: + =

*Think of *segmented* as correlation of and diversification benefit

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Equilibrium Approach

- Beta can be calculated as:

$$\beta_i = \frac{\text{cov}(i, m)}{\sigma_m^2} = \frac{\sigma_i \sigma_m \rho_{i, m}}{\sigma_m^2} = \rho_{i, m} \frac{\sigma_i}{\sigma_m}$$

- Covariance is:

$$\text{cov}_{ij} = \beta_i \beta_j \sigma_M^2$$

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Emerging Market Equity Risk

Emerging markets (EM) are often characterized as follows:

- Fragile economies
- Political and policy instability
- Weak property rights
- Weak disclosure and enforcement standards
- Tend to exhibit idiosyncratic risks
- Tend to be less fully integrated than developed markets

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Forecasting Real Estate Returns

Real estate cycles

- High- (low-)quality properties fluctuate less (more)
- Boom
 - Increased demand increases property values and lease rates; stronger economic activity
- Bust
 - Falling demand leads to overcapacity and decreases values and lease rates

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Capitalization Rates

- Assuming an infinite period:
 - $\text{Cap rate} = E(R_{re}) - \text{NOI growth rate}$
 - $E(R_{re}) = \text{cap rate} + \text{NOI growth rate}$
- For a finite period:
 - $E(R_{re}) = \text{cap rate} + \text{NOI growth rate} - \% \Delta \text{cap rate}$
- Cap rate = LT discount rate for RE property valuation:
 - + related to interest rates and vacancy rates
 - – related to supply of credit and debt financing

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Real Estate Risk Premiums

Total risk premium > corporate bonds < equities

- Term premium: for holding LT assets
- Credit premium: for risk of tenant nonpayment
- Equity risk premium: value, lease, vacancy fluctuations
- Also consider liquidity risk—about 2%–4% for commercial real estate
- Two key adjustments when used in models
 1. Smoothing impact removed from data
 2. Add liquidity premium

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Public vs. Private Real Estate

REITs, direct RE, equities

- High ρ between REITs and equities in ST
- Low ρ between direct RE and equities in ST
- High ρ between REITs and direct RE in LT

REITs

- On a leverage-adjusted basis, REITs have higher returns and lower volatility than direct RE
- Retail REITs: highest return, second-lowest volatility compared to apartments (lowest), offices, industrial
- Industrial REITs: lowest return, highest volatility

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Public vs. Private Real Estate

Direct RE (apartment, office, industrial, retail)

- Apartments have highest returns; offices have lowest returns

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Residential Real Estate Returns

Overall points

- Largest class of developed properties, accounting for 75% of global values
- Outperformed equities on an inflation-adjusted basis with lower volatility (70 years), but comparably weaker returns in past 40 years
- Residential RE returns uncorrelated globally, while equity returns show rising correlation

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Exchange Rate Forecasting

Net trade flows ($X - M$; assume $X < M$)

- If net imports are financed with FX, impact tends to be minor on exchange rates
- If net imports are large and not financed with FX, then crisis is likely to occur

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Exchange Rate Forecasting

Purchasing power parity (PPP)

- Implies prices in different countries should reflect changes in exchange rate
- Expected exchange rate movement should follow expected inflation rate differentials
- Does not work well in ST, but works better in LT
- Actual real exchange rates may differ than predicted by PPP due to trade barriers, nontraded items, capital flows, or other factors outside of PPP

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Exchange Rate Forecasting

Current account

- With capital flow restrictions, prices, quantities, and exchange rates would have to adjust so trade is always balanced
- Prices and quantities tend to change slowly, so much of the change lies with exchange rate
- Capital flows reduce pressure on exchange rates, but with capital flow restrictions, exchange rate sensitivity increases with current account (trade) balance
- Current account imbalances will have largest impact on exchange rates when they are persistent and sustained
- Length of imbalance is more important than size

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Exchange Rate Forecasting

Capital flow adjustments will have big impact on exchange rates

- Capital mobility
 - $E(\% \Delta S_{d/f}) = (r^d - r^f) + (\text{term}^d - \text{term}^f) + (\text{credit}^d - \text{credit}^f) + (\text{equity}^d - \text{equity}^f) + (\text{liquid}^d - \text{liquid}^f)$
- Uncovered interest rate parity (UCIRP)
 - $E(\% \Delta S_{d/f}) = i^d - i^f$ (nominal rates)
 - Successful carry trades are a violation of UCIRP

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Exchange Rate Forecasting

Portfolio balance and composition

- In ST, capital is likely to flow into the currencies of countries in the strongest phases of the business cycle.
- In LT, rapid economic growth comes with a greater share of that currency in the global market portfolio. The need to induce investors to increase their SAA to that currency generally will weaken the currency (subject to some mitigating factors).
- Large, persistent current account deficits funded in a given currency will weaken that currency over time as investors must shift their SAA toward that currency (again, subject to mitigating factors).

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