NET & SET Economics: Growth and Development Economics

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1. Economic Growth and Economic Development

Aspect	Economic growth	Economic development
Meaning	Sustained increase in real national or per capita income	Growth plus structural, social and institutional change that improves well-being
Nature	Quantitative	Quantitative and qualitative
Measure	GDP, per capita income growth	HDI, PQLI, poverty, inequality, life expectancy, literacy
Scope	Narrow	Broad
Relation	Necessary but not sufficient for development	Can be described as "growth plus change" (Kindleberger)

- **Growth without development:** rising GDP with persistent poverty and inequality ("jobless growth", "ruthless growth").
- **Structural transformation:** shift of output and labour from agriculture to industry and services (Colin Clark, Simon Kuznets, Hollis Chenery's patterns of development).
- **Dudley Seers:** development means reduction of poverty, unemployment and inequality.
- **Amartya Sen:** development is expansion of human **capabilities** and freedoms (*Development as Freedom*, 1999).
- **Michael Todaro's core values:** sustenance, self-esteem, freedom from servitude.
- **Sustainable development (Brundtland Report, 1987):** meeting present needs without compromising the ability of future generations to meet their own needs.
- **Kuznets' inverted-U hypothesis (1955):** inequality first rises then falls as per capita income grows.

Exam pointers: growth vs development; Sen's capability approach; Seers's three questions; Brundtland definition; Kuznets curve.

2. Theories of Economic Development

Classical theories

Theorist	Key ideas
Adam Smith (*Wealth of Nations*, 1776)	Division of labour limited by extent of market; capital accumulation; invisible hand; laissez-faire; productive vs unproductive labour
David Ricardo (*Principles*, 1817)	Diminishing returns in agriculture; rising rent squeezes profits → **stationary state**; comparative advantage; capitalists are the source of

Theorist	Key ideas
	accumulation
T.R. Malthus	Population grows geometrically, food arithmetically; effective demand deficiency
Karl Marx (*Das Kapital*, 1867)	Historical materialism; surplus value = s/v; capital accumulation → falling rate of profit, reserve army of labour, increasing misery, crises → collapse of capitalism
J.A. Schumpeter (*Theory of Economic Development*, 1911)	Innovation by the entrepreneur (new product, method, market, source of supply, organisation) disturbs the **circular flow**; bank credit finances innovation; **creative destruction**; cycles result from innovation clusters

Stage theories

- **W.W. Rostow (*Stages of Economic Growth*, 1960):** (1) traditional society, (2) preconditions for take-off, (3) **take-off** (20–30 years; investment rising to over 10% of national income; leading sectors; political/social framework), (4) drive to maturity, (5) age of high mass consumption. Criticised for linearity and overlapping stages (Kuznets).

Big Push and balanced growth

- **Rosenstein-Rodan (1943) — Big Push:** development requires a minimum critical mass of investment because of indivisibilities in **production function (social overhead capital), demand (complementarity), and supply of savings**. "Proceeding bit by bit will not add up in its effects to the sum total of single bits."
- **Ragnar Nurkse — balanced growth (1953): vicious circle of poverty** (low income → low saving → low investment → low productivity; and on demand side) broken by simultaneous investment across many industries that support each other's demand.
- Leibenstein's **critical minimum effort thesis (1957):** a sufficiently large initial stimulus is needed to overcome income-depressing forces.
- Nelson's **low-level equilibrium trap (1956):** population growth absorbs income gains.

Unbalanced growth

- **Albert Hirschman (*Strategy of Economic Development*, 1958):** deliberately create imbalances; invest in sectors with strongest **backward and forward linkages**; Social Overhead Capital (SOC) vs Directly Productive Activities (DPA) — development via excess capacity or shortage of SOC.
- **Paul Streeten**, **Singer** also supported unbalanced growth; key sectors pull others along.

Dualistic and other models

- **W. Arthur Lewis (1954) — unlimited supplies of labour:** surplus labour in subsistence sector (zero marginal productivity — disguised unemployment) moves to the capitalist sector at a constant institutional wage; reinvested profits drive growth until the **Lewis turning point**.
- **Ranis–Fei (1961):** three-phase extension of Lewis, stressing agricultural surplus.
- **Jorgenson (1961):** neoclassical dualism.
- **Todaro migration model (1969):** migration depends on expected urban income (wage × probability of employment).

- **Myrdal:** cumulative causation — backwash vs spread effects; **dependency theory** (Prebisch, Frank, Singer); **Harris–Todaro** model.

Exam pointers: match theorist with idea; Rostow's stages; Rosenstein-Rodan's three indivisibilities; Nurkse vs Hirschman; Lewis model.

3. Models of Economic Growth: Harrod–Domar, Solow, Robinson, Kaldor

Harrod–Domar model (Harrod 1939, Domar 1946)

$G = s/v$ (growth rate = saving ratio ÷ capital–output ratio)

- **Warranted growth rate (Gw = s/v):** rate at which entrepreneurs are satisfied — planned saving = planned investment.
- **Actual growth rate (G = s/C). Natural growth rate (Gn):** maximum rate allowed by labour force growth and technical progress.
- Steady growth requires G = Gw = Gn — a **"knife-edge"** equilibrium; deviations are cumulative (instability principle).
- If Gw > Gn → secular stagnation; Gw < Gn → secular inflation.
- Domar stressed the dual character of investment (demand-creating and capacity-creating).
- Assumes fixed coefficients (no substitution between capital and labour), constant s and v.

Solow–Swan neoclassical model (1956)

$\Delta k = s \cdot f(k) - (n + \delta)k$

- Production function $Y = F(K, L)$ with constant returns, diminishing returns to each factor, and substitutability.
- **Steady state:** $s \cdot f(k) = (n + \delta)k$ — capital per worker and output per worker constant; aggregate output grows at n (plus rate of technical progress g in the augmented model).
- Results: higher saving raises the level, not the long-run growth rate, of income per head; long-run growth comes only from exogenous technical progress.
- **Golden rule of accumulation (Phelps, 1961):** consumption per head is maximised when $MPK = n + \delta$ (saving rate = capital share under Cobb–Douglas).
- **Convergence:** conditional convergence — poorer economies with similar parameters grow faster.
- Removes the knife-edge problem via factor substitution.
- **Solow residual** (growth accounting, 1957): output growth not explained by inputs = total factor productivity growth.

Joan Robinson's model (*Accumulation of Capital*, 1956)

- Two classes: workers consume all, capitalists save; growth depends on rate of profit and capitalists' saving propensity.
- **Golden age:** steady growth with full employment where rate of accumulation equals natural growth rate; mythical state. Other ages: limping golden age, leaden age, bastard golden age, restrained golden age, platinum age.

Kaldor's model (1957)

- **Distribution and growth:** saving propensities of capitalists (sp) exceed those of workers (sw); share of profits P/Y = 1/(sp − sw) − sw/(sp − sw).
- Investment determines profits (Kaleckian "capitalists earn what they spend").
- **Technical progress function** replaces production function: growth of output per worker depends on growth of capital per worker.
- **Kaldor's stylised facts (1961)** of growth: constant growth of output per worker, rising K/L ratio, constant rate of profit, constant capital–output ratio, constant factor shares, variation in growth rates across countries.
- **Pasinetti (1962):** in the long run the rate of profit = n/sp (Cambridge equation), independent of workers' saving.

Exam pointers: knife-edge; Gw, Ga, Gn; Solow steady state and golden rule; Robinson's golden age; Kaldor's distribution formula and stylised facts.

4. Technical Progress: Disembodied and Embodied; Endogenous Growth

Technical progress

- **Disembodied:** improves productivity of all capital, old and new — "manna from heaven" (Solow 1957).
- **Embodied:** comes only through new capital goods — **vintage models** (Solow 1960, Johansen); **Arrow's learning by doing (1962):** productivity rises with cumulative gross investment.
- **Hicks's classification** (by effect on MPK/MPL at a constant K/L): labour-saving, capital-saving, neutral.
- **Harrod-neutral (labour-augmenting):** constant capital–output ratio at constant rate of profit — compatible with steady state.
- **Solow-neutral (capital-augmenting).**
- **Induced innovation (Hicks, Kennedy):** factor price changes induce innovations that save the expensive factor.

Endogenous growth theory (New Growth Theory)

- Explains long-run growth from within the model, through knowledge, human capital and R&D, with non-diminishing returns to reproducible factors.

Model	Mechanism
AK model (Rebelo, 1991)	Y = AK — constant returns to broad capital; growth = sA − δ; saving affects long-run growth
Paul Romer (1986, 1990)	Knowledge spillovers; ideas are non-rival; R&D sector produces new designs; increasing returns at aggregate level (Nobel 2018)
Robert Lucas (1988)	Human capital accumulation with external effects
Aghion and Howitt (1992); Grossman–Helpman	Schumpeterian creative destruction through quality ladders (Aghion and Howitt — Nobel 2025, with Joel Mokyr)

Model	Mechanism
Barro (1990)	Productive government spending
Mankiw–Romer–Weil (1992)	Augmented Solow model with human capital (still exogenous growth)

- Policy implications: education, R&D subsidies, patents, openness and institutions influence long-run growth; convergence not automatic.

Exam pointers: embodied vs disembodied; Hicks vs Harrod neutrality; Arrow's learning by doing; AK model; Romer and Lucas.

5. Indicators of Economic Development: PQLI, HDI, SDGs

Physical Quality of Life Index (PQLI)

- Developed by **Morris David Morris (1979)** for the Overseas Development Council.
- Three indicators equally weighted: **infant mortality, life expectancy at age one, basic literacy**; scale 0–100.
- Merits: simple, measures results not inputs. Limitations: ignores income and freedom; arbitrary equal weights.

Human Development Index (HDI)

- Introduced in UNDP's **Human Development Report (1990)** by **Mahbub ul Haq** with Amartya Sen.
- Three dimensions: **health** (life expectancy at birth), **education** (mean years of schooling for adults 25+, expected years of schooling for children), **standard of living** (GNI per capita, PPP $, log-transformed).
- Dimension index = (actual − minimum)/(maximum − minimum). Since 2010, HDI = **geometric mean** of the three indices (earlier arithmetic mean).
- Categories: very high (≥ 0.800), high (0.700–0.799), medium (0.550–0.699), low (< 0.550). India is in the "medium" category (HDR 2025 ranked India 130th of 193 countries for 2023).

Related UNDP indices

Index	Year	Measures
Inequality-adjusted HDI (IHDI)	2010	HDI discounted for inequality within each dimension
Gender Development Index (GDI)	1995 (revised 2014)	Ratio of female to male HDI
Gender Inequality Index (GII)	2010	Reproductive health, empowerment, labour market
Multidimensional Poverty Index (MPI)	2010 (UNDP–OPHI, Alkire–Foster method)	10 indicators in health, education, living standards
Planetary pressures-adjusted HDI	2020	HDI adjusted for CO_2 emissions and material footprint

Sustainable Development Goals (SDGs)

- Adopted by the UN General Assembly in **September 2015** (*Agenda 2030*), successors to the eight **Millennium Development Goals** (2000–2015).
- **17 goals, 169 targets**, for 2016–2030: no poverty, zero hunger, good health, quality education, gender equality, clean water and sanitation, affordable clean energy, decent work and growth, industry–innovation–infrastructure, reduced inequalities, sustainable cities, responsible consumption, climate action, life below water, life on land, peace and justice, partnerships.
- India: **NITI Aayog SDG India Index** (since 2018) ranks States and UTs.

Other measures

- Per capita income (World Bank classification by GNI per capita, Atlas method), Gross National Happiness (Bhutan), Genuine Progress Indicator, Basic Needs approach (ILO 1976), World Happiness Report.

Exam pointers: PQLI components; HDI dimensions and geometric mean; HDI thresholds; MPI method; 17 SDGs and 169 targets.

6. Poverty and Inequalities: Concepts and Measurement

Concepts of poverty

- **Absolute poverty:** inability to meet minimum basic needs — measured by a poverty line (income/consumption).
- **Relative poverty:** deprivation relative to others (e.g., below 50% of median income).
- **Multidimensional poverty:** deprivation in health, education, living standards.
- **Chronic vs transient poverty**; **capability deprivation (Sen)**; vulnerability.

Poverty measures

Measure	Formula / meaning	Limitation
Head-Count Ratio (H)	q/n — proportion of population below poverty line	Ignores depth and distribution
Poverty Gap Index	$(1/n)\ \Sigma\ (z - y_i)/z$ — average shortfall	Insensitive to distribution among the poor
Squared Poverty Gap (severity)	$(1/n)\ \Sigma\ [(z - y_i)/z]^2$	Gives more weight to the poorest
Foster–Greer–Thorbecke (FGT) class (1984)	$P\alpha = (1/n)\ \Sigma\ [(z - y_i)/z]^{\wedge}\alpha$; $\alpha = 0, 1, 2$ give H, PGI, severity	Decomposable by sub-groups
Sen's index (1976)	$P = H[I + (1 - I)G_p]$ — combines HCR, income gap ratio and Gini among the poor	Satisfies monotonicity and transfer axioms

- **Sen's axioms:** monotonicity (fall in a poor person's income raises poverty) and transfer (transfer from poorer to richer poor raises poverty).

- **World Bank international poverty line:** US$3.00 per day (2021 PPP), updated in June 2025 from US$2.15 (2017 PPP).

Poverty estimation in India

Committee / approach	Year	Key feature
Working Group	1962	₹20 per capita per month (rural) at 1960–61 prices
Dandekar and Rath	1971	Calorie norm of 2,250 per day
Y.K. Alagh Task Force	1979	Calorie norms: 2,400 rural, 2,100 urban
Lakdawala	1993	State-specific lines; CPI-AL and CPI-IW for updating
Tendulkar	2009	Shift away from calorie norm; basket including health and education; MRP; 21.9% poverty in 2011–12
C. Rangarajan	2014	Separate food and non-food basket; 29.5% poverty in 2011–12

- **NITI Aayog National MPI:** 12 indicators; multidimensional poverty fell from 24.85% (2015–16) to 14.96% (2019–21) as per the NFHS-based report (2023); a 2024 discussion paper estimated 11.28% for 2022–23.

Measures of inequality

- **Lorenz curve:** cumulative share of income vs cumulative share of population; farther from the line of equality → greater inequality.
- **Gini coefficient (Corrado Gini, 1912):** area between Lorenz curve and equality line ÷ total area under equality line; 0 (perfect equality) to 1.
- **Theil index** (entropy, decomposable), **Atkinson index** (incorporates inequality aversion parameter ε), **coefficient of variation**, **Palma ratio** (top 10% share ÷ bottom 40% share), **Kuznets ratio**, decile/quintile dispersion ratio.
- **Dalton's principle of transfers:** any transfer from richer to poorer reduces inequality — good measures satisfy it.

Exam pointers: FGT α values; Sen's index and axioms; Tendulkar vs Rangarajan; Gini and Lorenz; Palma ratio; World Bank $3.00 line.

7. Social Sector Development: Health, Education, Gender

Human capital and development

- **T.W. Schultz (1961):** investment in human capital (health, education, training) explains much of growth; **Gary Becker (1964)** *Human Capital*.
- **Mincer earnings function:** log earnings depends on years of schooling and experience; **rate of return to education** highest at primary level (Psacharopoulos).
- Social sectors have positive externalities and merit-good characteristics, justifying public provision.

Health

- Indicators: infant mortality rate (IMR), maternal mortality ratio (MMR), under-five mortality, life expectancy, total fertility rate, nutrition (stunting, wasting).
- Health–productivity linkages: **efficiency wage–nutrition hypothesis (Leibenstein)**, demographic transition, disease burden.
- India: National Health Policy 2017 (target public health spending of 2.5% of GDP); **National Health Mission (2013, merging NRHM 2005 and NUHM)**; **Ayushman Bharat (2018)** — Health and Wellness Centres (Ayushman Arogya Mandirs) and **PM-JAY** health insurance of ₹5 lakh per family per year; Poshan Abhiyaan (2018); Mission Indradhanush (2014).

Education

- Indicators: literacy rate, gross enrolment ratio, dropout rates, learning outcomes (ASER), pupil–teacher ratio.
- India: **Right to Education Act (2009)** — free and compulsory education for 6–14 years (Article 21A, 86th Amendment, 2002); **Samagra Shiksha (2018)**; PM POSHAN (mid-day meals); **National Education Policy 2020** — 5+3+3+4 structure, target of 6% of GDP on education, GER of 50% in higher education by 2035.
- Kothari Commission (1964–66) recommended 6% of GDP on education.

Gender

- Gender gaps in sex ratio, literacy, labour force participation, wages, assets, political representation; **"missing women" (Sen, 1990)**.
- Measures: GDI, GII, WEF Global Gender Gap Index.
- Women's empowerment and development: Boserup's *Woman's Role in Economic Development* (1970); WID → WAD → **GAD (Gender and Development)** approaches; feminisation of poverty; unpaid care work.
- India: gender budgeting (2005–06); Beti Bachao Beti Padhao (2015); Self-Help Groups (DAY-NRLM); maternity benefit (PMMVY); **Nari Shakti Vandan Adhiniyam (106th Amendment, 2023)** — one-third reservation for women in Lok Sabha and State Assemblies (to be implemented after delimitation).

Exam pointers: Schultz and Becker; NEP 2020 targets; Ayushman Bharat; GDI vs GII; Sen's missing women; WID–WAD–GAD.