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## **Five Theories of Economic Growth: Why Countries Adopt Different Models for National Policy**

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**Abstract:**

**Purpose:** *This paper aims to identify and analyze the relationship between theoretical models of economic growth and the practical economic policies adopted by states through a comparative case study of five countries. The central research questions are: Which economic growth theories (or combinations thereof) do contemporary nations apply in their economic policies, and why? Do any countries adhere to a single, “pure” theoretical framework in practice? The central hypothesis is that the adoption of a specific economic growth model is shaped by a country’s level of development, political system, and distinctive historical and cultural characteristics.*

**Design/Methodology/Approach:** *The study employs qualitative comparative analysis across five contrasting case studies selected according to level of development, political regime, and historical and cultural background. The analysis draws on academic literature and official economic statistics. Comparative tables serve as the primary analytical tool to visualize alignment between theoretical frameworks and national policies. The research was conducted in four sequential phases to ensure systematic and comprehensive analysis.*

*Phase 1: Theoretical Framework Development. A comprehensive literature review identified, described, and systematized five major economic growth theories: Malthusian, Marxist, Keynesian (Harrod–Domar), Neoclassical (Solow), and Endogenous Growth (Uzawa–Lucas). Their core principles, historical context, and policy implications were examined to construct a theoretical framework for empirical analysis.*

*Phase 2: Case Study Selection and Country Analysis. Five countries were selected as representative cases where the principles of specific growth theories are most visibly reflected in economic policy or outcomes:*

- DPRK — Malthusian framework
- Cuba — Marxist framework
- China — Keynesian framework
- Germany — Neoclassical framework
- Singapore — Endogenous growth framework

*Each case was analyzed in relation to development level, political regime, historical trajectory, and cultural characteristics.*

*Phase 3: Data Collection and Visualization. Empirical validation was conducted using data on key economic indicators (e.g., GDP, R&D investment, infrastructure expenditure) obtained from international databases, including the World Bank, and official national*

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statistics. These data were visualized through comparative graphs and charts to support the analytical findings.

*Phase 4: Synthesis and Comparative Analysis.* The final phase integrated theoretical and empirical findings. Comparative tables were constructed to juxtapose theoretical models and their practical implementation across the five countries, enabling systematic comparison of how national contexts shape the application of growth theories.

**Findings:** The study concludes that economic growth models are highly context-dependent and rarely implemented in pure form. Policy frameworks reflect hybridization shaped by institutional, political, and historical conditions. Future research may extend the analysis to additional countries or examine the evolution of policy paradigms over time.

**Practical Implications:** The findings are synthesized into an analytical framework and comparative tables that function as an accessible educational resource for economics and social science instruction, offering a structured approach to understanding comparative political economy.

**Originality/Value:** This study contributes to the literature by systematically linking growth theory selection to national socio-political and historical conditions, demonstrating that policy alignment with growth models is structured rather than arbitrary.

**Keywords:** Economic growth theory, comparative political economy, development models, economic policy, institutional context, growth regimes, qualitative comparative analysis, national development strategies, hybrid economic systems, policy frameworks.

**JEL Codes:** O10, O11, O40, O43, P21, P51.

**Paper type:** Research Paper.

## 1. Introduction

### 1.1 Theoretical Foundations of Economic Growth

Economic growth theory seeks to explain the vast disparities in income levels and long-term growth rates observed across nations. Its core mission is to identify the mechanisms that enable countries to achieve and sustain a trajectory of high, stable economic development.

The engine of growth is driven by fundamental factors: natural resources, labor, capital, technology, and, crucially, the efficiency of their allocation. Thus, the principal aim of growth theory is to model the interaction of these elements and derive practical recommendations for stimulating growth to enhance societal welfare. A direct correlation exists between economic growth and living standards (Mankiw, 2022).

An expanding economy, reflected in a rising Gross Domestic Product (GDP), signals higher output and consumption. This growth reduces unemployment as firms hire more workers to meet demand, simultaneously increasing household incomes and government tax revenues (Acemoglu, 2009). This creates a virtuous cycle: all economic actors, the state, firms, and households gain enhanced capacity for investment in areas like public goods, productive capacity, and private consumption, which in turn fuels further growth.

The evolution of economic thought on growth mirrors societal progress. Early theories, formulated in predominantly agrarian societies, prioritized factors of land and labor, focusing on the challenge of fulfilling basic subsistence needs. As economies industrialized, the focus shifted to capital accumulation. In the modern, knowledge-driven era, the emphasis has moved decisively towards technological innovation and human capital, reflecting the changing drivers of prosperity.

## **1.2 The Malthusian Theory of Population**

### ***1.2.1 Historical Context and Core Doctrine***

The Malthusian theory of population, formulated by the English cleric and scholar Thomas Robert Malthus (1766-1834) in his 1798 *An Essay on the Principle of Population*, was a pioneering work in demography and economics (Malthus, 1798/1992).

Malthus postulated two fundamental principles:

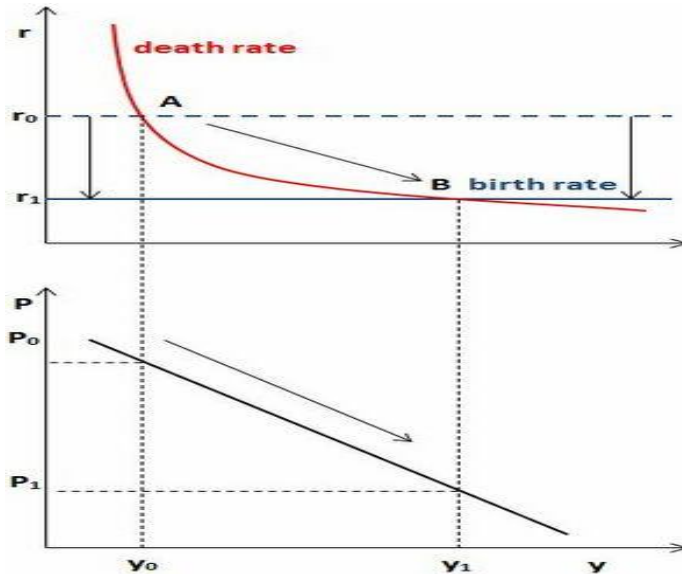
1. Population, when unchecked, grows at a geometric rate (e.g., 2, 4, 8, 16...).
2. The means of subsistence (food production) grow only at an arithmetic rate (e.g., 1, 2, 3, 4...).

This inevitable divergence leads to a "Malthusian Trap"—a point where population growth outstrips the food supply, resulting in "positive checks" such as famine, disease, and war that restore the balance. Malthus viewed poverty as an inescapable natural law rather than a solvable social ill, famously arguing that a poor person "has no claim of right to the smallest portion of food... At nature's mighty feast there is no vacant cover for him" (Malthus, 1798/1992).

### ***1.2.2 The Malthusian Economic Model***

The core logic of the Malthusian trap can be visualized through a simple demographic model (Figure 1).

- The birth rate schedule is represented by a horizontal line, assumed constant.
- The death rate schedule is a downward-sloping curve, indicating that mortality decreases as per capita income (a proxy for welfare) rises.
- An implicit assumption is that per capita income is inversely related to population size due to fixed resources (e.g., land).

**Figure 1.** *The Malthusian Economic Model*

*Source:* Ruwiki, (2020).

Working Mechanism:

- The initial equilibrium (Point A) is a subsistence-level balance between birth and death rates.
- A policy-induced reduction in the birth rate creates a demographic imbalance: deaths exceed births.
- As the population declines, implied per capita income rises, moving the economy along the death rate curve until a new, higher-income equilibrium (Point B) is established.

This model formalizes Malthus's conclusion: without controlling population, any temporary income gain is eroded by population growth.

### **1.2.3 Critical Analysis and Limitations**

Despite its historical influence, the Malthusian model contains critical flaws:

1. **Technological Progress:** The model fundamentally failed to foresee the Industrial Revolution, which dramatically boosted agricultural and industrial output through technological innovation, decoupling growth from finite land resources.
2. **Demographic Transition:** It did not account for the sustained decline in birth rates that accompanies rising incomes, urbanization, and education in developed societies.
3. **Logical Contradictions:** The model implies that increasing mortality (wars, epidemics) should improve living standards by reducing population pressure.

Historical evidence, such as the economic devastation following the Great Irish Famine (1845-1852), consistently contradicts this. A population crash of 25% did not lead to increased prosperity for survivors but to long-term economic scarring (Mokyr, 1983)

4. Ethical and Political Critique: Marxist thinkers, including Karl Marx, vehemently opposed Malthusianism, arguing that poverty was a product of exploitative social structures, not an immutable natural law (Marx, 1867/1976).

#### ***1.2.4 Lasting Relevance and Conclusion***

While its predictive power failed in the industrial and post-industrial eras, the Malthusian model accurately describes the "technological stagnation regime" that characterized most of human history before the 19th century (Galor, 2005). Furthermore, it retains explanatory power for some least developed economies where high population growth and low agricultural productivity create Malthusian pressures.

In conclusion, Malthusian theory's primary legacy is in identifying a fundamental tension between population and resources. Its limitations highlight the critical roles of technological innovation, human capital, and adaptive social institutions in escaping the trap and achieving sustained economic growth.

### **1.3 Keynesian Theory and the Harrod-Domar Model**

#### ***1.3.1 Keynesian Foundations***

Keynesian economics, developed by John Maynard Keynes during the Great Depression, fundamentally challenged the classical view of self-regulating markets. Its core premise is that aggregate demand is the primary driver of short-run economic performance and that active government intervention is necessary to stabilize the economy and maintain full employment (Keynes, 1936).

Keynes argued that during a downturn, the government should engage in deficit spending to boost demand, thereby stimulating output, investment, and job creation, even if this leads to temporary budget deficits.

#### ***1.3.2 The Harrod-Domar Model: Extending Keynes to the Long Run***

While Keynes focused on short-term stabilization, Roy Harrod (1900-1978) in the UK and Evsey Domar (1914-1997) in the US independently developed a model that extended Keynesian principles to the problem of long-term economic growth. Their combined work, known as the Harrod-Domar model, became a foundational theory in development economics.

The model posits that in the long run the economy's growth rate (G) is determined by the savings rate (s) and the capital-output ratio (k). The fundamental equation is:  
$$G = s / k$$

This formula implies that:

- Economic growth is directly proportional to the share of national income saved and invested (s).
- Growth is inversely proportional to the capital-output ratio (k), which measures the capital required to produce one unit of output (capital intensity).

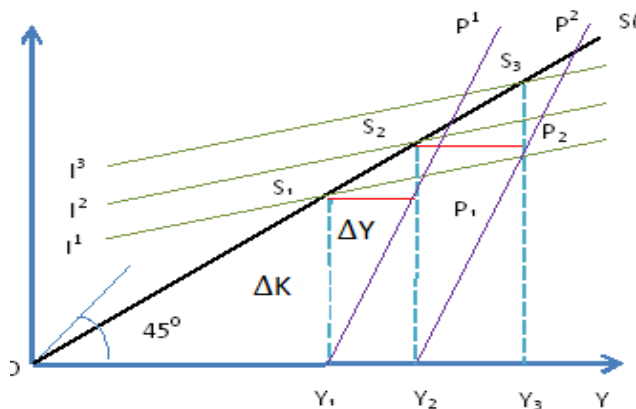
The model concludes that to achieve a high growth rate, a country must either increase its savings rate or improve the efficiency of its capital use (lower the capital-output ratio).

### 1.3.3 Graphical Interpretation

The model can be visualized using a diagram (Figure 2). The savings function (S) is shown as an upward-sloping line, indicating that savings increase with income. The investment requirements lines (I), which represent the level of investment needed to achieve a certain growth rate given the capital output ratio, are typically flatter.

The intersection points of these lines with the savings function determine the equilibrium levels of income and investment for different growth paths. The model illustrates how an increase in the savings rate shifts the savings function upward, leading to a higher equilibrium growth rate.

**Figure 2.** *The Harrod-Domar Model*



*Source:* Wikipedia, (2025).

### 1.3.4 Critical Analysis and Limitations

The Harrod-Domar model was influential, particularly in advocating for investment-led development. However, it has significant limitations:

1. **Structural Rigidities:** The model assumes fixed coefficients of production (no substitutability between capital and labor), which is unrealistic. It ignores technological progress and improvements in labor productivity.
2. **The "Knife-Edge" Problem:** The model describes an unstable equilibrium. Any deviation from the "warranted" growth rate is self-reinforcing, leading either to ever-increasing inflation or persistent unemployment problem that does not consistently align with observed economic behavior (Solow, 1956).
3. **Oversimplified View of Capital:** It focuses solely on physical capital, neglecting the crucial roles of human capital, institutions, and total factor productivity.
4. **Practical Failures in Development:** As a policy guide, it led to an overemphasis on capital accumulation in developing countries, often through foreign borrowing. This frequently resulted in massive debt burdens without sustainable growth, as the model ignored other vital factors like corruption, market efficiency, and social infrastructure.

### ***1.3.5 Conclusion on Relevance***

Despite its shortcomings, the Harrod-Domar model was a crucial first step in formalizing growth theory. It correctly highlighted the importance of investment and savings. Its legacy lies in paving the way for more sophisticated models, like the neoclassical Solow model, which introduced technological progress as an exogenous factor to explain long-run growth.

## **1.4 Marxist Political Economy**

### ***1.4.1 Core Principles: Class Struggle and Capital Accumulation***

Marxist political economy, developed by Karl Marx (1818-1883), offers a fundamentally different perspective on economic growth. It posits that the dynamics of growth are driven by class struggle over the means of production (Marx and Engels, 1848). Unlike other theories, it views the capitalist system as inherently conflictual and transient.

The central mechanism of growth is the accumulation of capital, financed by surplus value—the value produced by workers in excess of the cost of their labor power, which is appropriated by the capitalist class (Marx, 1867/1976). This creates the fundamental class antagonism between the proletariat (workers) and the bourgeoisie (capitalists).

### ***1.4.2 Key Analytical Frameworks***

The Circuit of Capital:

Marx described the economic process as a circuit:  $M \rightarrow C \dots P \dots C' \rightarrow M'$ .

- $M \rightarrow C$ : The capitalist advances money (M) to purchase commodities (C): means of production and labor power.
- $\dots P \dots$ : The production process (P) occurs, where labor creates new value.

- C' → M': The new commodities (C', of greater value) are sold for more money (M'), realizing the surplus value as profit. This circuit highlights how production, not just exchange, is the source of capitalist growth and crisis.

The Tendency of the Rate of Profit to Fall (TRPF):

A cornerstone of Marx's crisis theory is the Tendency of the Rate of Profit to Fall. The rate of profit is formulated as  $r = s / (c + v)$ , where:

- s = surplus value
- c = constant capital (machinery, raw materials)
- v = variable capital (wages)

Marx argued that competition forces capitalists to invest in labor-saving technologies (increasing c relative to v, a process he called a rising organic composition of capital). Since only labor (v) creates new value (s), this leads to a long-term tendency for the profit rate to fall, creating systemic crises of overproduction and unemployment (Marx, 1894/1991).

The Economic Cycle under Capitalism:

Marxist theory provides a robust explanation of the business cycle (see Figure 3), linking it to the internal contradictions of capital:

1. Expansion/Peak: High profits lead to accelerated accumulation and full capacity utilization.
2. Crisis/Recession (contraction): The falling rate of profit, overaccumulation of capital, and realization crises (inability to sell produced goods) trigger a downturn.
3. Depression/Slump (trough): Widespread unemployment, devaluation of capital, and business failures occur.

Recovery (expansion): The destruction of capital during the slump restores profitability, paving the way for a new cycle of accumulation.

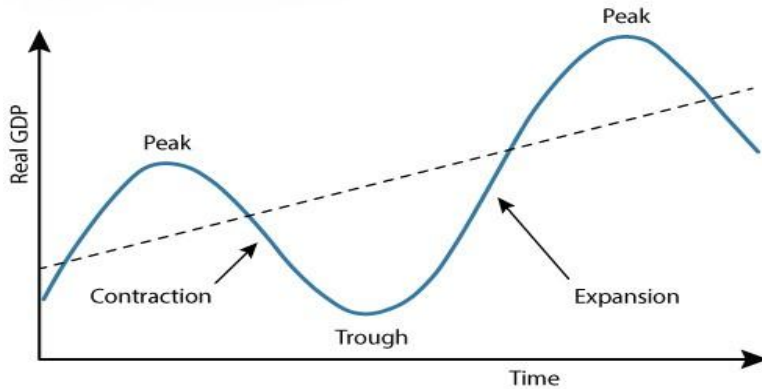
This cyclical process is viewed not as a mechanical inevitability but as the "violent resolution" of the system's internal contradictions.

### ***1.4.3 Critical Analysis and Limitations***

Strengths:

- **Emphasis on Power and Conflict:** It powerfully highlights the role of class conflict and power relations in shaping economic outcomes, which neoclassical economics often ignores.
- **Analysis of Systemic Crisis:** The TRPF and theory of overproduction offer a compelling, internally logical explanation for recurring capitalist crises.

**Figure 3.** *The Economic Cycle under Capitalism*



**Source:** *Federal Reserve Bank of St. Louis, (2023).*

**Weaknesses and Criticisms:**

1. **Empirical Validity of the TRPF:** The long-term empirical trend of the profit rate is hotly debated. Critics argue that countervailing tendencies (e.g., increased exploitation, cheapening of constant capital) have prevented the catastrophic collapse Marx predicted (Blaug, 1997).
2. **Technological Determinism:** The model underestimates the role of technological progress in creating new value and industries, focusing primarily on its labor-displacing effects.
3. **Underestimation of Institutional Adaptation:** Marx underestimated the capacity of capitalist states to mitigate class conflict through social welfare, labor laws, and Keynesian demand management, thereby enhancing the system's resilience.
4. **Predictive Failures:** Its predictions of absolute worker immiseration and inevitable revolution in advanced economies have not materialized, largely due to the factors above.

**1.4.4 Conclusion on Relevance**

While the Marxist model has limitations as a predictive tool, its diagnostic power remains immense. It provides an essential critical framework for understanding the inherent tensions between capital and labor, the tendency towards inequality, and the cyclical nature of growth under capitalism. Its focus on the social relations of production continues to influence heterodox economic thought.

**1.5 The Neoclassical Theory: The Solow Growth Model**

**1.5.1 Core Principles and the Solow Model**

The Neoclassical theory of economic growth, crystallized in the Solow Growth Model developed by Robert Merton Solow (1924–2023), represents a fundamental breakthrough in understanding long-run economic dynamics. Solow was awarded the Nobel Prize in 1987 for this contribution. His model shifted the focus from the

rigid assumptions of the Harrod-Domar model to a framework emphasizing factor substitution, diminishing returns, and technological progress.

The model's production function,  $Y = A * F(K, L)$ , where  $Y$  is output,  $K$  is capital,  $L$  is labor, and  $A$  is Total Factor Productivity (TFP), encapsulates its core ideas:

1. Capital Accumulation: Investment in physical capital is a key driver of growth.
2. Diminishing Returns: As capital per worker increases, its marginal product declines, leading the economy toward a steady state where capital per worker remains constant.
3. Exogenous Technological Progress: The model introduces the "Solow Residual"—the portion of economic growth not explained by increases in capital or labor. This residual is attributed to exogenous technological progress ( $A$ ), which is the ultimate engine of long-run per capita income growth (Solow, 1956).

### ***1.5.2 Graphical Interpretation and Mechanics***

The model's dynamics are best understood graphically (Figure 4).

- The curve  $y = f(k)$  represents output per worker as a function of capital per worker, reflecting diminishing returns.
- The investment line,  $s * f(k)$ , shows the share of output saved and invested.
- The depreciation line,  $\delta k = nk$ , represents the capital stock that wears out.

The steady-state equilibrium occurs where investment equals depreciation ( $s * f(k) = \delta k$ ). If capital per worker is below this point ( $k_1$ ), investment exceeds depreciation, and the economy accumulates capital. If it is above ( $k_2$ ), depreciation exceeds investment, and capital per worker falls.

An increase in the savings rate ( $s$ ) shifts the investment line upward, leading to a new, higher steady-state level of capital and output per worker. However, in the long run, without technological progress, growth in per capita output ceases.

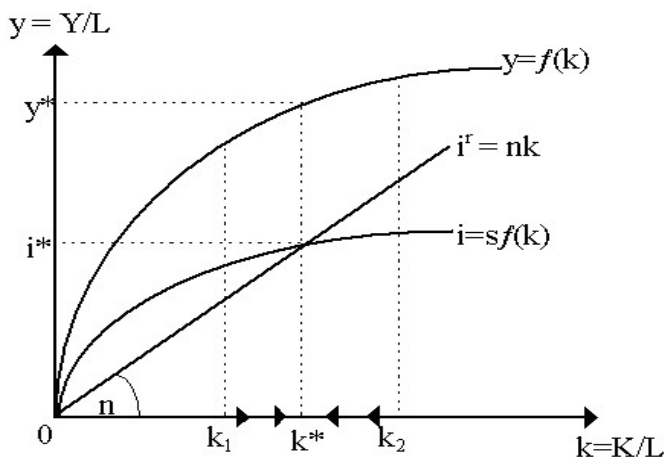
### ***1.5.3 Critical Analysis and Limitations***

The Solow model became the benchmark for growth theory due to its elegance and powerful insights, but it also has well-known limitations:

1. The "Black Box" of Technology: The model's primary weakness is its treatment of technological progress as an exogenous factor. It does not explain why technological advances occur or how economic policies and incentives can foster innovation (Romer, 1990).
2. The Convergence Puzzle: The model predicts conditional convergence—poorer countries should grow faster than richer ones once controlling for savings rates and population growth, as they are further from their steady state and experience higher returns on capital. The failure of many

developing nations to catch up to advanced economies ("the convergence puzzle") suggests that the model omits critical factors such as institutional quality, human capital, and political stability (Acemoglu, 2009).

**Figure 4.** *The Neoclassic Growth Model.*



**Source:** <https://cruel.org/econthought/essays/growth/neoclass/solowgr.html>.

3. Lack of Microfoundations: The model does not incorporate optimizing behavior by households and firms. Savings and population growth rates are assumed to be constant, not derived from individual decisions.
4. Unrealistic Assumptions: The assumptions of perfect competition, full employment, and a single homogeneous product are simplifications that do not hold in complex real-world economies.

### **1.5.4 Conclusion and Legacy**

Despite its limitations, the Solow model's legacy is profound. It provided the first coherent framework to disentangle the contributions of capital, labor, and technology to growth. By highlighting the centrality of technological progress, it set the stage for subsequent endogenous growth theories, which sought to explain technological change within the model itself. The Solow model remains an indispensable starting point for any serious discussion of economic growth.

## **1.6 Endogenous Growth Theory: The Uzawa-Lucas Model**

### **1.6.1 The Paradigm Shift from Exogenous to Endogenous Growth**

Endogenous growth theory emerged in the 1980s as a direct response to the limitations of the Solow model. While Solow treated technological progress as an exogenous "manna from heaven," endogenous growth models seek to explain technological change within the economic system itself. These models posit that long-term growth is driven by internal factors such as investments in human capital,

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innovation, and R&D, which are influenced by economic incentives and policy decisions (Romer, 1990).

The fundamental difference lies in the properties of the key drivers. In these models, knowledge and human capital are not subject to diminishing returns in the same way physical capital is. This allows for constant or even increasing returns to scale at the aggregate level, making sustained long-run growth possible without relying on an external force.

### ***1.6.2 The Uzawa-Lucas Model: Human Capital as the Engine of Growth***

A cornerstone of this new paradigm is the Uzawa-Lucas model, developed by Hirofumi Uzawa (1928-2014) and later expanded by Robert Lucas Jr. (1937-2023), who won the Nobel Prize in 1995 for his contributions.

The model formalizes the idea that human capital accumulation—the knowledge and skills embodied in the workforce—is a primary engine of growth. Individuals decide how to allocate their time between current production and education (accumulating human capital). This decision generates a positive externality: the average level of human capital in society boosts the productivity of all factors of production, creating a spillover effect that benefits the entire economy (Lucas, 1988).

### ***1.6.3 Graphical Interpretation and Policy Implications***

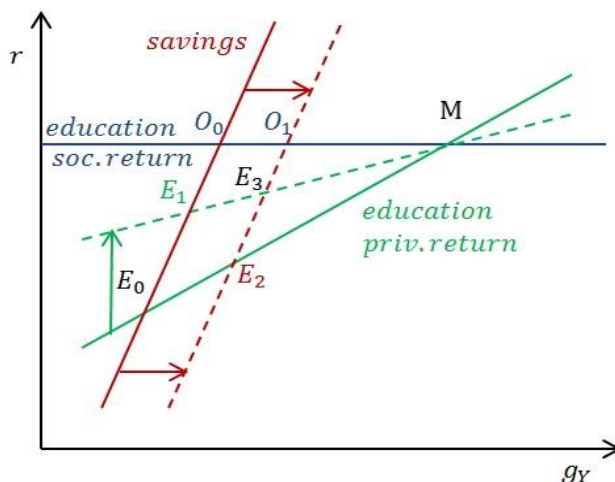
The model's implications can be visualized (Figure 5), distinguishing between private and social returns to education:

- The private return curve represents the benefits of education for an individual.
- The social return curve lies above the private return, capturing the positive externalities of a more educated society.
- The financial constraint line represents the individual's trade-off between investing in education and earning immediate income.

In a competitive equilibrium, individuals invest in education only up to the point where the private return meets their financial constraint. However, the social optimum is achieved at a higher level of investment, where the social return equals the cost. This creates a clear role for government policy:

1. **Subsidizing Education:** This lowers the effective cost for individuals, shifting their financial constraint and encouraging them to move closer to the social optimum.
2. **Increasing Savings/Investment:** This relaxes the financial constraint, allowing for greater investment in human capital.

**Figure 5.** *The Uzawa-Lucas Model*



*Source:* Wikipedia, (2019).

### **1.6.4 Critical Analysis and Legacy**

Strengths:

- Explains Sustained Growth: The model provides a rigorous explanation for why developed economies can maintain growth without hitting a Solow-style steady state.
- Highlights Policy Levers: It offers a theoretical foundation for investing in education, R&D, and intellectual property protection as deliberate growth strategies.
- Addresses Divergence: It explains why countries with strong educational systems and innovation ecosystems (e.g., South Korea, Singapore) can achieve rapid, sustained growth, while countries that underinvest in human capital may fall behind permanently.

Limitations:

1. Empirical Measurement: Quantifying human capital and its externalities is notoriously difficult, making the model hard to calibrate and test precisely.
2. Institutional Context: The model, in its basic form, does not fully incorporate the role of institutions, political stability, and financial markets in facilitating human capital investment and innovation.
3. Complexity: The models are mathematically more complex than the Solow model, which can make them less accessible for policy formulation.

### **1.6.5 Conclusion: The Evolution of Growth Theory**

The Uzawa-Lucas model represents a fundamental evolution in economic thought. It successfully endogenized the most important driver of growth—human knowledge. By doing so, it transformed our understanding from a view of growth as a passive process (Solow) to one where growth is an active outcome of investments,

incentives, and policies. It firmly established that a country's most valuable resource is not its physical capital, but the skill and creativity of its people.

**Table 1. Comparative Analysis of Five Major Economic Growth Theories**

Criterion	Malthusian theory	Harrod-Domar model	Marxist theory	Neoclassical theory (Solow model)	Endogenous Growth Theory (Uzawa-Lucas model)
Founder	Thomas Robert Malthus	Roy Harrod, Evsey Domar	Karl Marx	Robert Solow	Hirofumi Uzawa, Robert Lucas
Period	Late 18th century	1939, 1946	Mid-19th Century	1956–1957	1960s-1980s
Primary growth driver	Land, natural resources	Capital Accumulation & Aggregate Demand	Capital & Labor (Exploitation)	Exogenous Technological Progress & Capital	Human Capital & Knowledge Spillovers
Core mechanism	Population vs food supply	Investment = Savings ( $I = S$ )	Surplus Value Extraction & Capital Accumulation	Diminishing Returns & Steady State	Constant Returns to Human Capital
Role of the state	Non-intervention	Active Intervention (Fiscal Policy)	Dictatorship of the Proletariat (Control of Means of Production)	Minimal Intervention (Ensure Market Functioning)	Strategic Investor in Education & R&D
View of human capital	Negative (population is a burden)	Source of Demand & Labor Input	Class Conflict (Proletariat vs. Bourgeoisie)	Factor of Production (Labor)	Primary Engine of Growth (Knowledge Carrier)
Central question	Will resources be sufficient for population growth?	How to maintain short-term stability and full employment	Who exploits whom in the production process?	How to achieve stable long-run per capita growth?	How do policies and incentives affect long-run growth?
Ultimate goal	Prevent Societal Collapse	Economic Stability & Full Employment	Overthrow Capitalism (Classless Society)	Maximize Per Capita Output & Consumption	Sustainable Long-Run Growth through Innovation
Policy Prescription	Moral Restraint; Positive Checks (Famine, War)	Active Fiscal Policy; Demand Management	Revolution; Social Ownership of Capital	Promote Savings & Investment; Secure Property Rights	Subsidize Education & R&D; Protect Intellectual Property

Strengths	Highlights resource constraints; explains pre-industrial stagnation	Emphasizes investment role; simple policy framework for development	Powerful critique of capitalism; focus on distribution & conflict	Elegant explanation of convergence; identifies technology as key residual	Explains sustained growth; endogenizes technological progress
Weaknesses	Ignores technological progress; failed predictions post-Industrial Revolution	"Knife-edge" instability; fixed coefficients are unrealistic; no role for price mechanism	Overly deterministic; underestimates adaptability of capitalism; poor predictive power	Technology is exogenous ("black box"); fails to explain persistent income differences	Human capital is hard to measure; underplays institutional & geographic factors

### 1.7 Conclusion

This comparative analysis of five major economic growth theories has demonstrated that their evolution is not a sequence of replacements, but a process of cumulative development and refinement. Each theory emerged as a response to the limitations of its predecessors and the unique challenges of its historical context, collectively providing a multi-faceted understanding of the engines of prosperity.

My investigation confirms the central hypothesis: the applicability and dominance of a particular growth model are profoundly shaped by a country's unique combination of development level, political regime, and historical and cultural context.

- The Malthusian model accurately describes the equilibrium of pre-industrial societies but fails to account for the transformative power of technology.
- The Harrod-Domar model provided a crucial Keynesian framework for state-led development but was constrained by its rigid assumptions.
- Marxist theory offered a powerful critique of capitalist dynamics but underestimated the system's adaptability and the role of non-economic factors.
- The Neoclassical Solow model elegantly explained conditional convergence and identified technology as the key to long run growth yet left technological progress itself as an unexplained exogenous factor.
- Finally, Endogenous Growth theories internalized this driver, identifying human capital and innovations shaped by incentives and policies as the fundamental sources of sustained, long-term growth.

The global application of these models is a testament to their diagnostic power. Pragmatic synthesis, not dogmatic adherence to a single theory, characterizes successful economic policy. Modern China employs a hybrid of state-led investment (Harrod-Domar/Keynesian) and a drive for technological self-sufficiency (Endogenous Growth). Germany's social market economy blends neoclassical

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fundamentals with a strong social safety net. Singapore's success is a textbook case of endogenous growth strategy focused on human capital.

Thus, the five theories are not competing truths, but complementary tools in an economist's toolkit. The journey from Malthus to Lucas reflects our deepening understanding that economic growth is not a mechanical process, but a complex social phenomenon driven by resources, incentives, institutions, and, most importantly, human knowledge and creativity. Future theories will undoubtedly continue this evolution, further unraveling the mysteries of how nations prosper.

## **2.1 Case Study 1: The Democratic People's Republic of Korea (DPRK) – A Modern Malthusian Analogue**

While no modern state explicitly adheres to Malthusian doctrine, the Democratic People's Republic of Korea (DPRK) exhibits a socioeconomic condition that closely mirrors a Malthusian trap, not by ideological choice but because of its political system and isolation.

### *Political System as the Primary Driver:*

The DPRK's Juche ideology, emphasizing national self-reliance and isolation, functions as a political enforcer of economic autarky. This has led to a situation where the state, in pursuit of military and political power (Songun policy), systematically diverts resources away from agriculture and consumption, artificially creating the scarcity Malthus theorized about (Cumings, 2004).

A totalitarian control apparatus regulates all distribution, suppresses market mechanisms, and restricts labor mobility, preventing the natural adjustments that could alleviate resource constraints (Lankov, 2013).

### *Historical Reinforcement:*

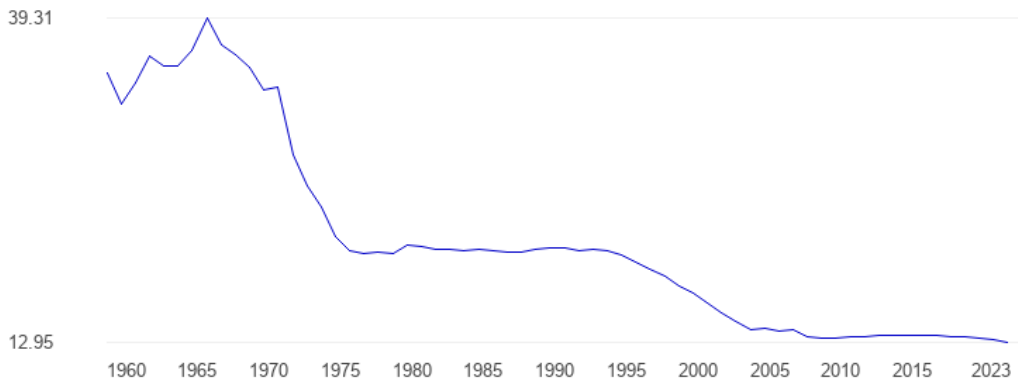
The nation's historical trajectory has cemented this path. The legacy of Japanese colonialism left an underdeveloped economic base, while the trauma of the Korean War and the subsequent geopolitical isolation fostered a siege mentality.

The collapse of the Soviet Union in 1991, a critical economic benefactor, triggered a catastrophic famine in the 1990s (the "Arduous March"), which was a stark, real-world Malthusian crisis where the population could not be sustained by the available means of subsistence (Haggard and Noland, 2007).

### *Empirical Evidence: Stagnation and Crisis:*

The demographic and economic consequences of this system are stark. As shown in Figure 6, the population growth rate in the DPRK has shown a long-term decline and significant volatility since the 1960s, with sharp drops corresponding to periods of extreme famine and economic shock, such as the 1990s. This pattern of "positive checks" (in this case, politically induced) is a hallmark of a Malthusian dynamic.

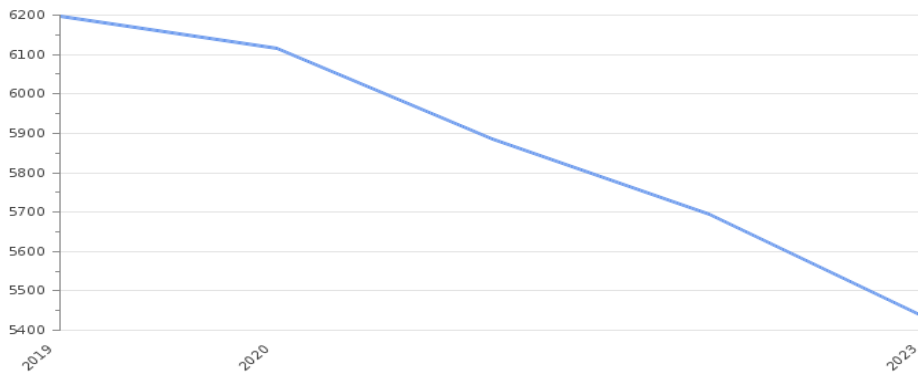
**Figure 6.** *The population growth rate in the DPRK*



**Source:** *The Global Economy*, [https://ru.theglobaleconomy.com/North-Korea/birth\\_rate/](https://ru.theglobaleconomy.com/North-Korea/birth_rate/)

Furthermore, the economic outcome of this model is chronic stagnation. Figure 7 illustrates the dismal performance of GDP per capita, which remains among the lowest in the world and has experienced periods of severe contraction. The data confirms that the country's isolation and resource misallocation have prevented it from achieving sustained economic development, locking it in a low-level equilibrium (Bank of Korea Statistics, 2023).

**Figure 7.** *The dismal performance of GDP per capita in DPRK*



**Source:** <https://take-profit.org/statistics/gdp/north-korea/>

*Socio-Cultural Acceptance:*

A culture of nationalistic sacrifice and a pervasive personality cult around the ruling Kim dynasty have normalized chronic scarcity for the populace (Myers, 2010). The regime frames enduring hardship as a patriotic duty, which suppresses internal dissent and initiatives for change, thereby perpetuating the stagnant economic model.

*Conclusion on the DPRK:*

Thus, the DPRK does not "follow" Malthusian theory but has politically engineered

a Malthusian reality. Its condition demonstrates that Malthusian outcomes are less a function of natural law and more a potential consequence of specific political choices and institutional structures that prioritize state power over economic vitality and human welfare. The empirical evidence from Figures 6 and 7 provides clear, visual confirmation of this engineered stagnation.

## 2.2 Case Study 2: The People's Republic of China – State-Led Keynesianism with Endogenous Ambitions

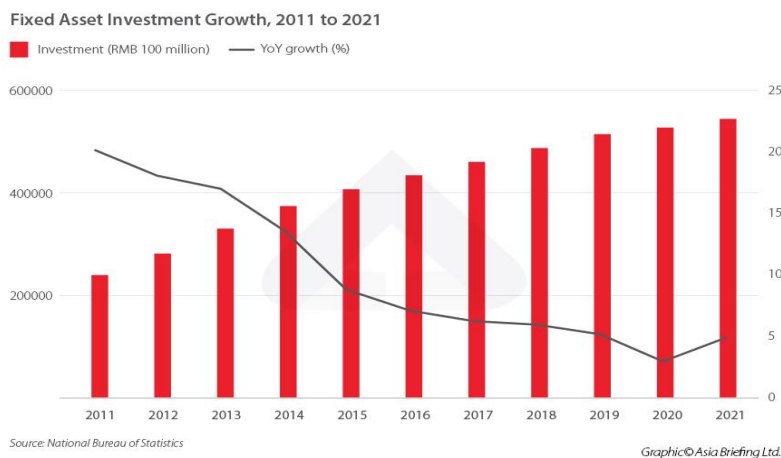
The People's Republic of China presents a compelling case of pragmatic heterodoxy, where Keynesian principles form the operational core of economic policy, strategically blended with elements of other growth models to meet evolving national challenges.

### *Level of Development and Keynesian Imperative:*

As a developing nation with immense internal disparities, China's primary task since the 1980s has been rapid industrialization and infrastructure development. The Keynesian model, with its emphasis on state-directed investment to stimulate aggregate demand, was the logical tool (Naughton, 2018).

The government became the principal investor in roads, ports, and energy grids, which not only boosted immediate demand but also created millions of jobs for a growing workforce, facilitating a massive structural shift from agriculture to industry. As shown in Figure 8, the consistently high and rising share of gross fixed capital formation in GDP visually demonstrates this enduring Keynesian commitment to investment-led growth.

**Figure 8.** Gross fixed capital formation in GDP of China



**Source:** National Bureau of Statistics, <https://www.china-briefing.com/news/china-infratsructure-investment-in-2022-spurring-economic-growth/>

*Political Regime as an Enabling Mechanism:*

China's single-party authoritarian system is a critical enabler of this model. It allows for rapid, centralized decision-making and long-term policy continuity, essential for executing massive, multi-year infrastructure projects (Hsueh, 2011). The state's control over the financial system ensures that credit is directed towards strategic sectors according to national plans, not purely market-based profitability. This "developmental state" model leverages Keynesian tools with a strategic, long-term vision that surpasses typical short-term demand management.

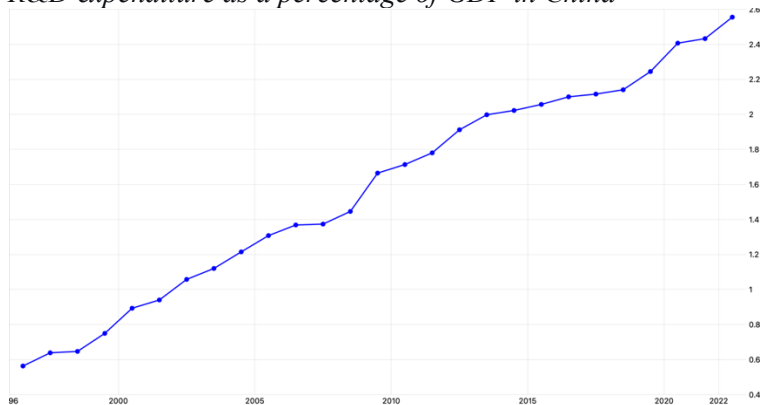
*Historical and Cultural Context:*

The legacy of the "Century of Humiliation" (1839-1945) forged a powerful national consensus on the goals of economic sovereignty and catching up with the West (Callahan, 2010). This historical trauma created a societal receptiveness to a strong, intervening state that could mobilize resources for national rejuvenation. Confucian traditions of hierarchy and collectivism further reinforce this acceptance of state leadership in economic life.

*Evolution towards a Hybrid Model:*

While Keynesian demand management remains the foundation, China's policy has evolved. Recognizing the limits of capital-intensive growth, the state has increasingly incorporated elements of endogenous growth theory. Figure 9 illustrates this strategic pivot, showing a marked rise in R&D expenditure as a percentage of GDP since the late 1990s. Initiatives like "Made in China 2025" explicitly aim to achieve technological supremacy through direct state support for innovation and human capital development, moving beyond simple infrastructure investment (State Council of China, 2015).

**Figure 9.** R&D expenditure as a percentage of GDP in China



**Source:** Time Luft, <https://time.luft.co.jp/ru/economy/asia/china/rd-expenditure-gdp>

*Conclusion on China:*

China does not follow a "pure" economic theory but has mastered a dynamic synthesis. It employs Keynesianism in the macro-management of demand and

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investment, operates through a "developmental state" apparatus for strategic direction, and is increasingly leveraging endogenous growth policies to climb the global value chain. This pragmatic adaptability, rooted in a unique political and historical context, has been the hallmark of its unprecedented growth story.

### **2.3 Case Study 3: Republic of Cuba – Marxist Political Economy in Transition**

Cuba represents a paradigmatic case of a developing nation that consciously implemented Marxist political economy, experiencing both its ideological consistency and practical limitations.

#### *Historical Implementation of Marxist Doctrine:*

Following the 1959 revolution, Cuba underwent a radical economic transformation. The new government led by Fidel Castro systematically abolished private property and nationalized the means of production, particularly the sugar industry that was dominated by U.S. interests and the local elite (Mesa-Lago, 2000). This represented a direct application of the Marxist principle of eliminating class exploitation through state ownership.

#### *Political Structure and International Alignment:*

The establishment of a single-party system provided the institutional framework for centralized economic planning. Cuba's confrontation with the United States and subsequent alliance with the Soviet Union further cemented its Marxist orientation. Soviet subsidies, which at their peak accounted for up to 20% of Cuban GDP, created dependency while enabling the preservation of the planned economy model (Pérez-Stable, 2011).

#### *Socio-Cultural Foundations:*

The revolutionary struggle against the Batista regime created a powerful narrative of national liberation and collective sacrifice. This historical experience, combined with the legacy of Spanish colonial inequality, fostered a cultural receptiveness to socialist ideals of equality and state-led development (Gott, 2004).

#### *Economic Consequences and Contemporary Challenges:*

The fragility of this model became starkly evident after the collapse of the Soviet Union. As shown in Figure 10, Cuba experienced a catastrophic 35% decline in GDP between 1990-1993 during the "Special Period," demonstrating the vulnerability of an isolated, planned economy to external shocks (Mesa-Lago, 2000).

Despite recent market-oriented reforms that allow limited private enterprise, the state maintains dominant control over the means of production and resource allocation. The persistent economic challenges, including low productivity, currency deficits, and dependence on food imports illustrate the ongoing difficulties in transitioning from a pure Marxist model while maintaining political continuity.

**Figure 10.** Cuba's GDP between 1990-1993



Source: [https://www.researchgate.net/figure/Cubas-GDP-growth-rate-between-1980-and-2012\\_fig1\\_272816633](https://www.researchgate.net/figure/Cubas-GDP-growth-rate-between-1980-and-2012_fig1_272816633)

*Conclusion on Cuba:*

Cuba exemplifies how Marxist political economy can become institutionalized through revolutionary change, political consolidation, and international alignment. However, its experience also demonstrates the structural limitations of central planning and the challenges of maintaining economic sovereignty without integration into global markets. The country's current gradual reforms represent a pragmatic adaptation to these realities while attempting to preserve core socialist principles.

**2.4 Case Study 4: Federal Republic of Germany – The Ordoliberal Synthesis**

Germany exemplifies a sophisticated implementation of neoclassical principles through the framework of social market economy (Soziale Marktwirtschaft), blending market efficiency with social cohesion.

*Economic Stability as a Development Imperative:*

As a mature, export-oriented economy, Germany's priority is maintaining stability and predictability rather than pursuing maximal growth. This aligns with the neoclassical emphasis on creating favorable conditions for private investment and innovation. As shown in Figure 11, Germany's economic growth demonstrates remarkable stability without sharp fluctuations, reflecting the successful application of these principles (Sachverständigenrat, 2023).

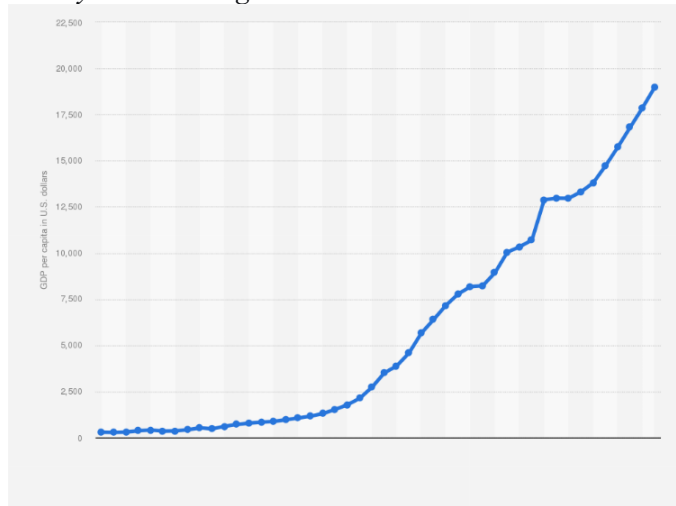
*Institutional Architecture of a Neoclassical State:*

Germany's political structure is deliberately designed to limit discretionary state intervention:

- Federal system distributes economic authority, preventing centralized planning

- Independent Bundesbank (and later ECB) prioritizes price stability above all else
- Ordoliberal framework establishes the "rules of the game" while allowing market forces to operate freely within them (Bonefeld, 2017)

**Figure 11.** Germany's economic growth



**Source:** [https://www.statista.com/statistics/263775/gross-domestic-product-gdp-per-capita-in-china/?srsltid=AfmBOoqH6\\_9scEIYVY8dObhkutsOdncDJWtpswgpXk8h5wIdwcPqOEVw](https://www.statista.com/statistics/263775/gross-domestic-product-gdp-per-capita-in-china/?srsltid=AfmBOoqH6_9scEIYVY8dObhkutsOdncDJWtpswgpXk8h5wIdwcPqOEVw)

This institutional design directly addresses Germany's historical traumas - the hyperinflation of 1923 and the totalitarian control of the Nazi era - creating a profound cultural aversion to both monetary irresponsibility and centralized economic planning.

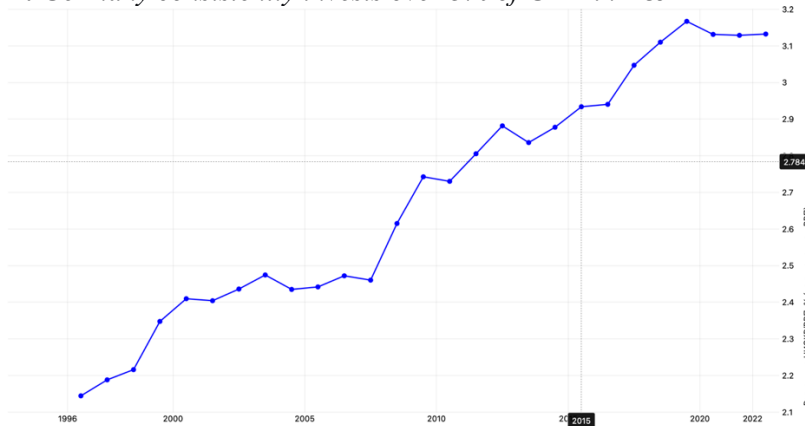
*Cultural Foundations: Ordnung and Social Consensus:*

The German cultural value of *Ordnung* (order) perfectly complements the neoclassical requirement for predictable economic rules. Simultaneously, the strong tradition of social partnership between employers, unions, and government creates the "social" component that moderates pure market capitalism through co-determination (*Mitbestimmung*) and robust social protections (Streeck, 1997).

*Innovation-Driven Growth Strategy:*

Germany has strategically channeled neoclassical principles into a powerful innovation ecosystem. As demonstrated in Figure 12, Germany consistently invests over 3% of GDP in R&D, with the majority coming from private industry seeking competitive advantage (OECD, 2023). This investment flows through unique institutions like the Fraunhofer Society and Max Planck Institutes that bridge fundamental research and industrial application, particularly in Germany's traditional strengths of automotive engineering, machinery, and industrial automation.

**Figure 12.** Germany consistently invests over 3% of GDP in R&D



**Source:** <https://take-profit.org/en/statistics/gdp/germany/>

*Conclusion on Germany:*

Germany does not practice "pure" neoclassical economics but has developed a distinctive ordoliberal variant that emphasizes:

- Rule-based monetary and fiscal policy
- Institutional independence from political interference
- Strategic private-sector led innovation
- Social compensation for market outcomes

This model demonstrates how neoclassical principles can be successfully adapted to national historical experiences and cultural values while maintaining core commitments to market mechanisms and technological progress as the primary engines of growth.

**2.5 Case Study 5: Republic of Singapore – The Quintessential Endogenous Growth Model**

Singapore represents the world's most successful deliberate implementation of endogenous growth principles, transforming from a resource-poor port to a global innovation hub through strategic investments in human capital and knowledge.

*Existential Imperative as Economic Strategy:*

Following its unplanned independence in 1965, Singapore faced an existential crisis: complete absence of natural resources. This necessitated a radical redefinition of national wealth, positioning human capital as the ultimate resource (Lee, 2000). The government strategically targeted knowledge-intensive sectors—finance, biotechnology, IT, and logistics—where value creation derives from intellectual rather than physical capital.

*Political Architecture for Long-Term Planning:*

Singapore's single-party dominant system under the People's Action Party (PAP) has provided unprecedented policy continuity and political stability essential for long-term human capital investments. The meritocratic system ensures that economic planning is driven by technical expertise rather than political patronage, creating a virtuous cycle of talent allocation (Tan, 2012).

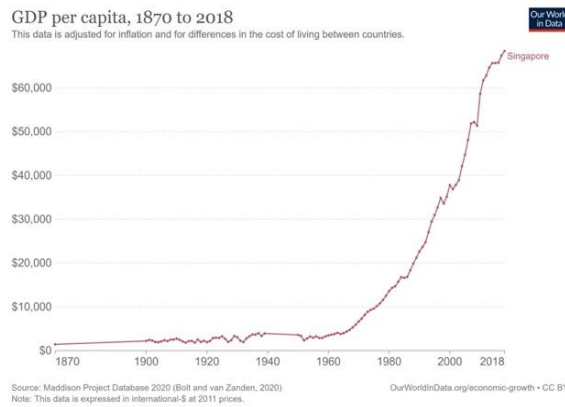
*Historical Trauma and Cultural Foundations:*

The "trauma of expulsion" from Malaysia in 1965 created a powerful national narrative of vulnerability and self-reliance that continues to drive economic policy. This historical experience, combined with Confucian values of education and social harmony, created a cultural foundation perfectly aligned with endogenous growth requirements (Vogel, 2011). The population's trust in state leadership enabled ambitious, long-term investments in education and infrastructure.

*Comprehensive Human Capital Development System:*

Singapore's approach to endogenous growth is remarkably comprehensive. As shown in Figure 13, Singapore's GDP per capita has demonstrated spectacular growth, reflecting the success of its human capital strategy. Simultaneously, Figure 14 illustrates the consistent upward trajectory in education investment, while Table 2 details the sophisticated allocation of educational resources across different levels.

**Figure 13.** *Singapore's GDP per capita*



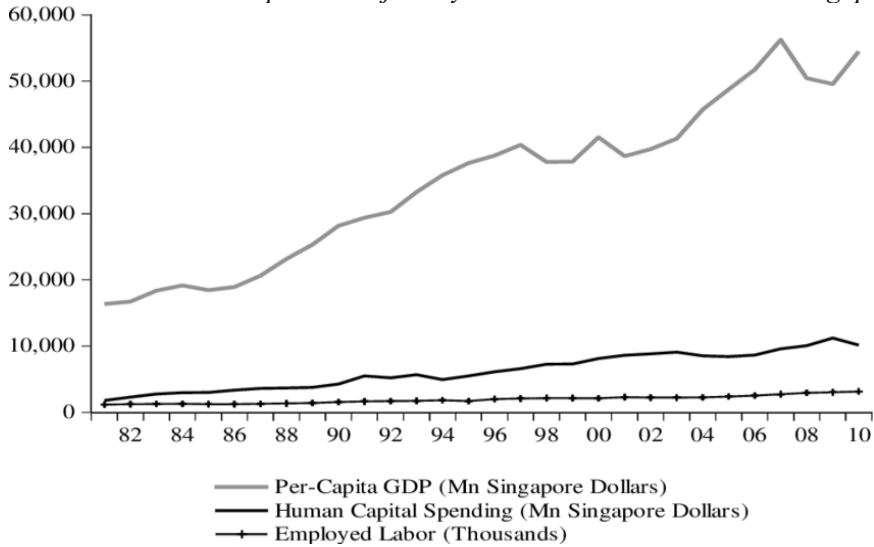
Source:

[https://commons.wikimedia.org/wiki/File:GDP\\_per\\_capita\\_development\\_of\\_Singapore.jpg](https://commons.wikimedia.org/wiki/File:GDP_per_capita_development_of_Singapore.jpg)

The government has created an integrated ecosystem where:

- World-class universities (National University of Singapore, Nanyang Technological University) anchor research and development
- Vocational training institutes (ITE) ensure workforce readiness
- Strategic immigration policies attract global talent to complement local human capital

**Figure 14.** *The consistent upward trajectory in education investment in Singapore*



**Source:** [https://www.researchgate.net/figure/Time-plots-of-Per-Capita-GDP-Human-Capital-Investment-and-Labor-Employment\\_fig3\\_298329899](https://www.researchgate.net/figure/Time-plots-of-Per-Capita-GDP-Human-Capital-Investment-and-Labor-Employment_fig3_298329899)

**Table 2.** *Allocation of educational resources across different levels*

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
3,65	3,20	2,86	2,95	2,76	3,01	3,08	3,03	3,07	2,85	2,92	2,86	2,87	2,76	2,86	2,73	2,69	2,82	2,49	2,19

**Source:** <https://statbase.ru/data/sgp-education-expenditure-share-of-gdp/>

**Conclusion on Singapore:**

Singapore demonstrates that endogenous growth is not merely an economic theory but a comprehensive national strategy that requires:

- Political stability for long-term planning
- Cultural alignment with education and meritocracy
- Strategic targeting of knowledge-intensive sectors
- Integrated human capital development across all education levels

The Singaporean model proves that sustained economic growth can be engineered through deliberate investments in human knowledge and institutional quality, even in the absence of conventional natural resources.

**Table 3.** *Comparative Analysis of Economic Growth Models in Five Countries*

Country / Criterion	Dominant Economic Model	Key Supporting Policies	Development Level Influence	Political Regime Impact	Historical Determinants	Cultural Foundations

<b>North Korea</b>	Malthusian Reality	Central planning, resource rationing, military-first policy	Undeveloped, low-income economy, subsistence agriculture, technological isolation	Totalitarian dictatorship, complete state control over resources	Japanese colonialism, Korean War, Soviet collapse (1991)	<i>Juche</i> ideology, cult of personality, siege mentality
<b>China</b>	State-Led Keynesianism + Developmental State	Infrastructure investment, state-owned enterprises, five-year plans	Developing, upper-middle income, regional disparities, structural transformation	Single-party authoritarianism, state capitalism	"Century of Humiliation" (1839-1945), economic reforms (1978)	Collectivism, paternalistic governance, meritocratic tradition
<b>Cuba</b>	Marxist Political Economy	State ownership, central planning, limited market reforms	Developing, lower-middle income, import dependency, service-based economy	Single-party socialist state, centralized control	Spanish colonialism, 1959 Revolution, US embargo	Revolutionary solidarity, anti-imperialism, social equality values
<b>Germany</b>	Social Market Economy (Ordoliberal)	Independent central bank, competition policy, vocational training	Developed, high-income, advanced industrial, export-oriented	Federal democracy, institutional checks and balances	Hyperinflation (1923), Nazi dictatorship, post-war reconstruction	<i>Ordnung</i> (order), social partnership, engineering excellence
<b>Singapore</b>	Pragmatic Endogenous Growth	Strategic education investment, R&D funding, global talent attraction	Developed, high-income, knowledge-based, global hub	Dominant-party meritocracy, pragmatic governance	Independence (1965), no natural resources, regional instability	Confucian meritocracy, pragmatism, future orientation

### 3. Conclusion

The conducted comparative study of five countries and their corresponding economic growth theories fully confirms the initial hypothesis: the choice and implementation of an economic model are determined by a unique combination of a country's level of development, political regime, historical path, and cultural characteristics.

#### **Key Research Findings:**

1. The Hybrid Nature of Economic Models: The analysis demonstrated that there are no examples of "pure" adherence to a single economic theory in the modern world. All successful economies represent pragmatic hybrids: China combines Keynesian tools with a "developmental state" model, Germany integrates neoclassical principles with a social component, and Singapore has embedded endogenous growth within a market system.

2. **Systemic Interconnection Factors:** The research revealed a clear correlation between economic policy and contextual factors:
  - The Level of Development determines priorities: developing countries focus on basic infrastructure and industrialization, while developed economies concentrate on innovation and human capital.
  - The Political Regime dictates implementation mechanisms: authoritarian systems enable rapid reform execution, whereas democratic ones create stable institutional frameworks.
  - Historical Experience shapes a nation's "economic psyche": the German trauma of hyperinflation, China's "century of humiliation," and Singapore's struggle for survival continue to influence these countries' economic choices.
3. **Culture as a Critical Factor:** The study showed that economic models only work when they align with a society's cultural code. Confucian values in Singapore, the German concept of "Ordnung" (order), and collectivism in China are no less important for economic success than formal institutions.

***Theoretical and Practical Significance:***

The results of this research are significant for economic policy. They indicate that the direct transfer of successful economic models without considering the national context is doomed to fail. An effective economic strategy must account for not only economic indicators but also the socio-political context, historical traditions, and cultural specifics.

***Directions for Future Research:***

A promising direction for further study would be the analysis of the dynamics of economic models—how countries alter their economic strategies in response to global challenges such as digital transformation, climate change, and geopolitical instability.

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