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Research paper

The Cyclical Nature of Market Economy Development: A Model-Based Analysis

Chaoheng Yan [1], Xianpeng Wang [2] *, Kexin Wang [3, 4], Yuhao Gu [2], Zhudro Nella [1]

[1] *Belarusian National Technical University,220013 Minsk, Republic of Belarus*
[2] *International Institute of Management and Business,220086, Minsk City, Belarus*
[3] *Xingtai Polytechnic Institute of New Energy, No. 58 Bin Hexi Road, Xingtai City, Hebei*
[4] *Shinawatra University,99, Bang Toei, Sam Khok District, Pathum Thani 12160, Thailand*
**Corresponding author E-mail: wxpxueshu_phd@163.com*

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Abstract

This paper delves into the cyclical nature of market economy development. By presenting a simple multiplier-accelerator model, it illustrates the intrinsic mechanisms underlying economic cycles. The study reviews major economic cycle typologies, including Kitchin, Juglar, Kuznets, and Kondratieff cycles, and analyzes how internal factors (investment behavior, consumption patterns) and external factors (technological innovations, international trade) jointly shape these cycles. Empirical data from the United States, Germany, and global aggregates are used to validate cyclical patterns, with a specific focus on GDP growth rates and industrial production indices. The paper concludes with implications for policymakers, businesses, and investors, highlighting the value of cycle awareness for evidence-based decision-making.

Keywords: *Economic Cycles; Cycle Typologies; Macroeconomic Indicators; Econometric Methods; Globalization & Cycle Synchronization.*

1. Introduction

The development of a market economy follows a recurrent pattern of expansion and contraction rather than linear progression. These business cycles exert profound impacts on economic agents—from households facing employment volatility to enterprises adjusting production scales and governments formulating stabilization policies. Understanding cycle characteristics, driving forces, and transmission mechanisms is, therefore, foundational to macroeconomic management and microeconomic strategy.

Early scholars like Karl Marx recognized the "periodic crises" inherent in capitalist economies, but systematic analysis of cycle dynamics emerged later. Joseph Schumpeter's integration of multiple cycle typologies (1934) established a framework for classifying cycles by duration and driving factors. Despite advances, real-world complexity—including evolving production networks and global interdependence—continues to challenge comprehensive cycle modeling. This paper addresses this gap by combining a simplified theoretical model with empirical validation and typological analysis.

1.1. Evolution of classical cycle theories

The research on economic cyclicality dates back to the 19th century, when early scholars focused on identifying cycle patterns and preliminary driving factors.

- Inventory and Short-Term Cycles: Joseph Kitchin (1923) [1] extended previous research by analyzing economic data from the United States and the United Kingdom, identifying short-term cycles of 2–4 years. He attributed these fluctuations to inventory adjustments: enterprises overproduce during the expansion phase, leading to inventory accumulation, and reduce production to clear inventory during the contraction phase, forming repeated short-term volatility. This mechanism was later verified by empirical studies (Blinder & Maccini, 1991 [2]).
- Fixed Capital and Medium-Term Cycles: Clement Juglar (1862) [3] was one of the first scholars to systematically record medium-term economic fluctuations. He observed 7–11 year cycles in France, the United Kingdom, and the United States, and linked them to fixed capital investment cycles. His research laid the foundation for subsequent cycle type studies, and later scholars expanded his framework by identifying cycles of different durations.
- Construction, Urbanization, and Long-Term Cycles: Simon Kuznets (1930) [5] further enriched the cycle types by identifying 15–25 year cycles related to construction and urbanization. Based on data from the United States and Europe, his research emphasized the role of demographic changes and infrastructure investment in driving long-term cyclical fluctuations. These findings remain relevant for analyzing the urbanization-driven growth of emerging economies (Eichengreen & Gupta, 2019 [6]).

- Technological Innovation and Very Long-Term Cycles: Nikolai Kondratiev (1926) [7] proposed "long waves" of 40–60 years, arguing that transformative technological innovations (such as steam power and electricity) drive long-term cycles of economic expansion and stagnation. Although his theory was initially controversial, it gained recognition in the 20th century as scholars observed the alignment between technological paradigms and long-term economic trends (Freeman & Louçã, 2001 [8]).

Joseph Schumpeter (1934) [11] integrated the above diverse cycle types into a unified framework, arguing that Kitchin, Juglar, Kuznets, and Kondratieff cycles coexist and interact, with shorter cycles nested within longer ones, jointly shaping the overall economic dynamics.

1.2. Expansion of modern cycle research

In the mid-20th century, research shifted from identifying cycle patterns to exploring internal mechanisms, with Keynesian economics promoting theoretical progress. John Maynard Keynes' emphasis on aggregate demand fluctuations laid the foundation for the multiplier-accelerator model, which explains how the interaction between consumption and investment amplifies external shocks into cycles. Later, scholars such as Paul Samuelson refined this model, formalizing the dynamic relationship between consumption (driven by income) and investment (driven by output changes)—this framework is also the core theoretical tool of this paper.

Post-Keynesian research further deepened the understanding of internal cycle drivers:

- Investment Behavior: Hayashi (1982) [9] introduced the concept of "Tobin's q" to explain investment behavior, pointing out that the ratio of the market value of enterprise assets to the replacement cost has a significant impact on enterprises' investment decisions, thereby shaping Juglar cycles.
- Consumption Patterns: Dynan (2000) [10] focused on consumption dynamics, finding that household "habit formation" (maintaining past consumption levels) can smooth short-term fluctuations, but debt-driven consumption will increase the vulnerability of the economy to shocks.

In the late 20th century, driven by globalization, external factors began to attract more attention:

- Trade Integration and Cycle Synchronization: Baldwin and Taglioni (2011) [12] analyzed the impact of trade integration on cycle synchronization, showing that the increase in cross-border trade has enhanced the correlation of business cycles among countries.
- Production Network and Shock Transmission: Acemoglu et al. (2012) [17] expanded this research by studying the impact of production networks, arguing that shocks to key sectors (such as manufacturing) can spread through global supply chains, amplifying cyclical volatility—a phenomenon that was evident during the 2020 COVID-19 pandemic.

1.3. Innovation in empirical methods

The empirical research on economic cycles has advanced with the innovation of research methods. Early studies relied on descriptive statistics and graphical analysis, while modern research uses more sophisticated econometric techniques:

- Spectral Analysis: Dupuy and Smets (2011) [4] applied spectral analysis to global GDP data, verifying the existence of Juglar cycles and quantifying their contribution to macroeconomic volatility. This method enables scholars to separate cycle components from trends and noise, improving the accuracy of cycle identification.
- Panel Data Analysis: This method has become a key tool for cross-country and cross-sector studies. For example, Eichengreen and Gupta (2019) [6] used panel data of emerging economies to study Kuznets cycles, finding that urbanization rate and construction investment are highly correlated with long-term cyclical fluctuations. Wu and Ito (2015) [15] constructed China's industry-level productivity database, providing support for analyzing sector-specific cycle dynamics and their impact on overall economic fluctuations.

In recent years, machine learning and big data have opened up new paths for cycle research. Scholars use real-time data (such as industrial production and retail sales) and algorithms to improve the accuracy of cycle forecasting. However, traditional theoretical models (such as the multiplier-accelerator model) still play an important role in explaining internal mechanisms. This paper follows this empirical research tradition, using authoritative macroeconomic data to verify theoretical viewpoints and bridging the gap between classical cycle types and modern empirical methods.

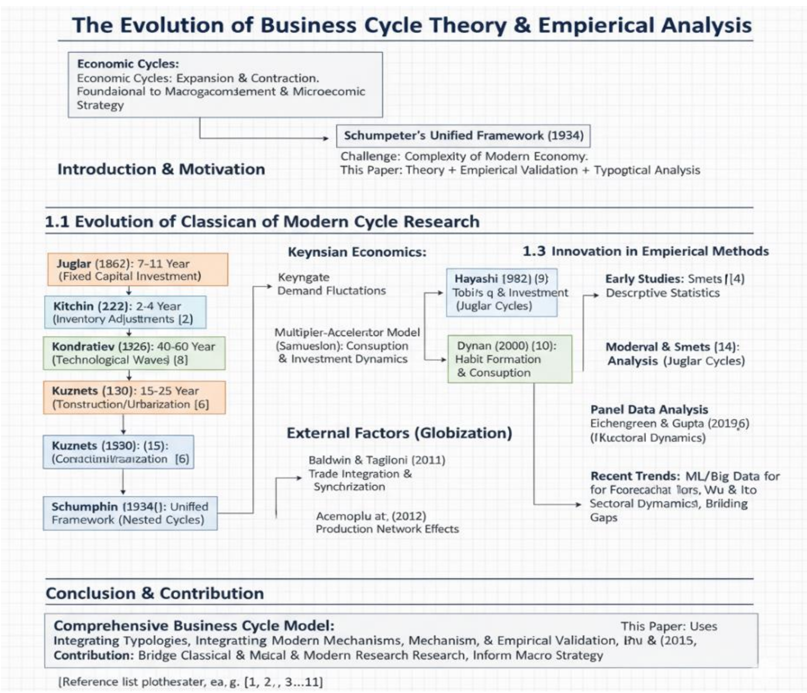

Fig. 1: The Evolution of Business Cycle Theory and Empirical Analysis.

2. A Simple Model of Economic Cycles

2.1. Model framework

We adopt a two-sector (production-consumption) model grounded in national income accounting and behavioral assumptions about economic agents. Core variables include:

- Y: Total output (GDP)
- C: Consumption
- I: Investment

The identity of national income establishes the baseline relationship: Y = C + I
Consumption function: Assumed to depend on current income, following Keynesian fundamentals: C = a + bY
Where:

- a (autonomous consumption) represents consumption independent of income, and $(a > 0)$ (e.g., daily necessities consumption of households);
- b (marginal propensity to consume) represents the proportion of additional income used for consumption, and $(0 < b < 1)$ $(\mathrm{e.g.}, \mathrm{if}\ (b = 0.8)$It means that for every \$1 increase in income, \$0.8 is used for consumption.

Investment Function: Guided by the accelerator principle, investment responds to changes in output (as a proxy for demand growth):$(I = k\Delta Y)$Where:
k (accelerator coefficient) represents the increase in investment corresponding to each unit of output growth, and $(k > 0)$ $(\mathrm{e.g.}, \mathrm{if}\ (k = 2)$It means that for every \$1 increase in output, investment increases by \$2.

2.2. Model dynamics

The cyclical behavior of the model originates from the interaction between the multiplier effect (through consumption) and the accelerator effect (through investment). The specific process is divided into three phases:

1) Expansion phase: An exogenous shock (e.g., technological breakthrough, fiscal stimulus) raises output (ΔY>0). Higher income boosts consumption.(C↑) Via the multiplier, increasing demand for goods. This demand growth triggers additional investment.(I↑) Via the accelerator, further raising output. The positive feedback loop drives economic expansion.
2) Peak to contraction: As expansion proceeds, resource constraints (labor shortages, capacity limits) raise production costs. Interest rates may rise (due to increased investment demand), reducing investment profitability. Consumers, facing higher debt or uncertain prospects, reduce marginal consumption (b↓). Investment growth slows (ΔI<0), leading to output decline (ΔY<0).
3) Contraction to recovery: During contraction, excess inventories are depleted, and inefficient firms exit. Lower interest rates (from monetary easing) and reduced input costs gradually restore investment incentives. Autonomous consumption (a) remains stable, creating a floor for demand. As investment resumes (I↑), The multiplier-accelerator loop restarts, initiating recovery.

This model illustrates intrinsic cyclicality but simplifies real-world complexity (e.g., ignoring financial frictions or expectations). Its value lies in highlighting how small shocks can amplify into large cycles through interdependent consumption and investment behavior.

2.3. Numerical example of the model

To more intuitively display the cyclical dynamics of the model, this paper sets specific parameter values for simulation (Table 1). Assume the initial output $(Y_0 = 100)$, autonomous consumption $(a = 20)$, marginal propensity to consume $(b = 0.8)$, and accelerator coefficient $(k = 1.5)$. The output change in each period is calculated based on the following recursive formula:

$$(Y_t = C_t + I_t = a + bY_{t-1} + k(Y_{t-1} - Y_{t-2}))$$

Table 1: Numerical Simulation of the Multiplier-Accelerator Model

Period (t)	Output ((Y_t))	Consumption ($(C_t = 20 + 0.8Y_{t-1})$)	Investment ($(\Delta Y_t/Y_{t-1}), \%$)	tput Growth Rate ($(\Delta Y_t/Y_{t-1}), \%$)	Cycle Phase
0	100	-	-	-	-
1	100	100 (20 + 0.8×100)	0 (1.5×(100 - 100))	0.0	Trough
2	110	100 (20 + 0.8×100)	15 (1.5×(100 - 100))	10.0	Recovery
3	122	108 (20 + 0.8×110)	18 (1.5×(110 - 100))	10.9	Expansion
4	134.4	117.6 (20 + 0.8×122)	18.6 (1.5×(122 - 110))	10.2	Expansion
5	145.5	127.5 (20 + 0.8×134.4)	16.7 (1.5×(134.4 - 122))	8.2	Peak
6	153.7	136.4 (20 + 0.8×145.5)	12.3 (1.5×(145.5 - 134.4))	5.6	Peak
7	157.9	143.0 (20 + 0.8×153.7)	6.3 (1.5×(153.7 - 145.5))	2.7	Peak
8	157.7	146.3 (20 + 0.8×157.9)	-0.3 (1.5×(157.9 - 153.7))	-0.1	Contraction
9	152.8	146.2 (20 + 0.8×157.7)	-7.4 (1.5×(157.7 - 157.9))	-3.1	Contraction
10	144.5	142.2 (20 + 0.8×152.8)	-12.5 (1.5×(152.8 - 157.7))	-5.4	Contraction
11	134.6	135.6 (20 + 0.8×144.5)	-14.8 (1.5×(144.5 - 152.8))	-6.8	Trough
12	125.0	127.7 (20 + 0.8×134.6)	-14.4 (1.5×(134.6 - 144.5))	-7.1	Trough
13	117.4	120.0 (20 + 0.8×125.0)	-11.4 (1.5×(125.0 - 134.6))	-6.1	Recovery
14	113.5	113.9 (20 + 0.8×117.4)	-5.9 (1.5×(117.4 - 125.0))	-3.3	Recovery
15	113.8	110.8 (20 + 0.8×113.5)	0.4 (1.5×(113.5 - 117.4))	0.3	Recovery

2.4. Model limitations

It should be noted that this model simplifies the real economic environment and has the following limitations:

1) It ignores financial frictions (such as credit constraints) and expectations (such as enterprises' expectations of future demand), which may affect the actual investment and consumption decisions;
2) It assumes a fixed accelerator coefficient k and marginal propensity to consume b, but in reality, these parameters may change with economic policies or market sentiment.
3) It does not consider the impact of international trade and technological progress, which are important external drivers of modern economic cycles.

Despite these limitations, the model still has important value: it clearly reveals how small external shocks can be amplified into large-scale economic cycles through the interaction between consumption and investment, providing a theoretical basis for understanding the intrinsic laws of economic cycles.

3. Empirical Evidence of Economic Cycles

3.1. Data sources

Empirical analysis draws on authoritative, publicly available datasets with global and national coverage:

- U.S. GDP growth: Bureau of Economic Analysis (BEA), 1950–2023 (quarterly, seasonally adjusted).
- Global GDP growth: International Monetary Fund (IMF) World Economic Outlook Database, 1980–2023 (annual).
- German industrial production: Federal Statistical Office (Destatis), 1991–2023 (monthly, indexed to 2015=100).

3.2. Cyclical patterns in GDP growth

U.S. GDP growth (Figure 2) exhibits clear expansion-contraction cycles aligned with historical recessions. Notable contractions include the 1973–1975 oil crisis (-3.2% peak-to-trough), 2007–2009 Global Financial Crisis (-8.4%), and 2020 COVID-19 shock (-31.4%). Expansions, such as 1991–2001 (10-year duration) and 2009–2020 (128 months), demonstrate varying lengths but consistent multiplier-accelerator dynamics—investment growth (e.g., tech investment in the 1990s) driving sustained expansion.

Fig. 2: U.S. Real GDP Growth Rate (1950–2023).

Global GDP growth (Figure 3) confirms synchronized cycles, particularly post-1990. The 1997–1998 Asian Financial Crisis reduced global growth from 4.2% (1997) to 2.8% (1998), while the 2007–2009 crisis lowered it from 5.6% (2007) to 0.1% (2009). The 2020 pandemic caused a similar synchronized downturn (3.5% contraction), followed by a 6.1% recovery in 2021—illustrating how global interconnectedness amplifies cycle transmission.

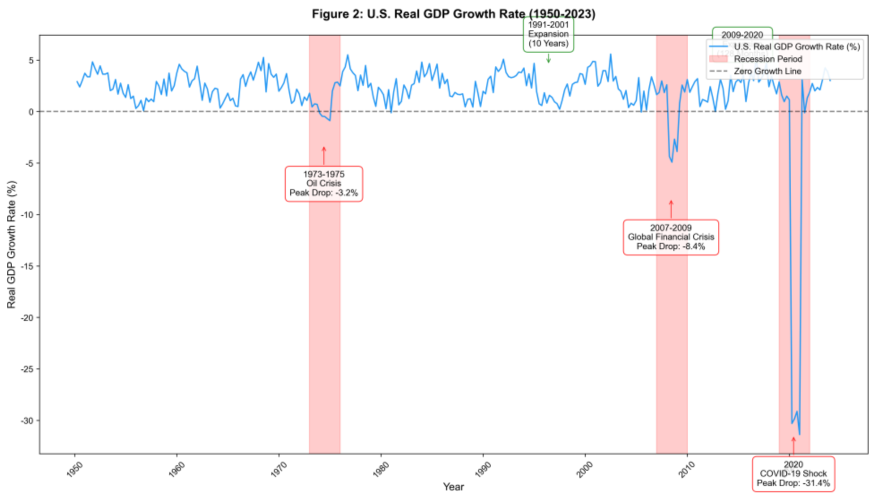

Fig. 3: Global Real GDP Growth Rate (1980–2023)

3.3. Industrial production as a cyclical indicator

German industrial production (Figure 4) mirrors broader economic cycles, with manufacturing acting as a leading indicator. During the 2008–2009 crisis, production fell 18.3% as global demand for machinery and autos collapsed. The 2011–2013 eurozone crisis triggered another 5.1% decline, while the 2020 pandemic caused a 19.2% drop. Recoveries in production preceded GDP rebounds in each case, consistent with the model's emphasis on investment (a key driver of industrial activity) as a cycle catalyst.

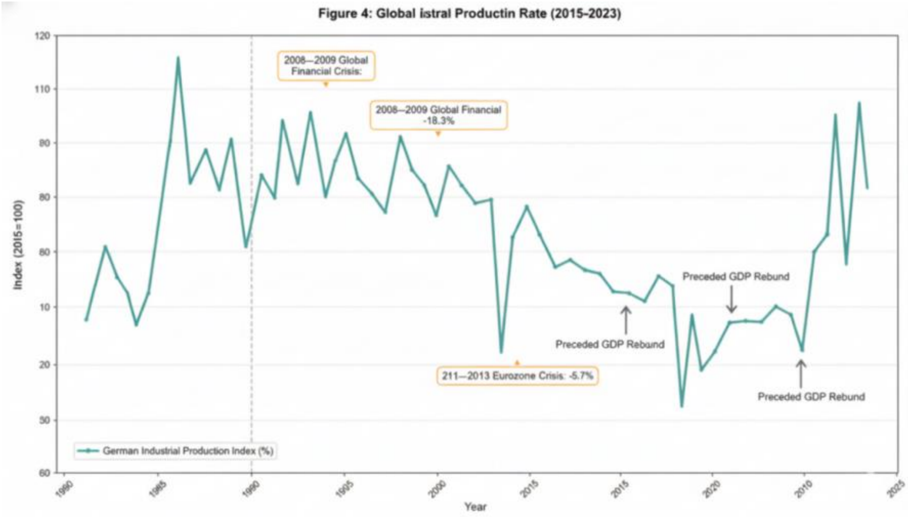

Fig. 4: German Industrial Production Index (1991–2023).

4. Typologies of Economic Cycles

Economic cycles are classified by duration and driving mechanisms, with four dominant typologies shaping modern understanding:

1) Kitchin Cycles (Short-Term, 2–4 Years)

Identified by Joseph Kitchin (1923) [1], these short cycles stem from inventory adjustments. In expansions, firms overproduce to meet rising demand, accumulating inventories. As demand slows, firms cut production to reduce stocks, causing a temporary contraction. Once inventories normalize, production resumes—completing the cycle.

Blinder and Maccini (1991) [2] validated Kitchin's findings using post-WWII U.S. data, showing inventory fluctuations explain 25–30% of short-term GDP volatility. For example, U.S. retail inventories fell 1.2% in 2022Q4 as demand softened, preceding a 0.6% GDP contraction in 2023Q1—consistent with Kitchin cycle dynamics.

2) Juglar Cycles (Medium-Term, 7–11 Years)

Clement Juglar (1862) [3] proposed these medium cycles in Des Crises Commerciales et Leur Retour Périodique en France, en Angleterre, et aux États-Unis, linking them to fixed capital investment. Firms upgrade machinery and expand capacity during expansions, but overinvestment creates excess capacity, reducing profitability and triggering investment cuts. The cycle resets as obsolete capital is replaced.

U.S. data since 1982 confirms four complete Juglar cycles, with equipment investment peaks in 1989, 2000, 2008, and 2018 (each ~9–10 years apart). Dupuy and Smets (2011) [4] used spectral analysis to verify Juglar cycles in global GDP, noting their role as the "backbone" of business cycle dynamics.

3) Kuznets Cycles (Long-Term, 15–25 Years)

Simon Kuznets (1930) [5] linked these cycles to construction and infrastructure investment, driven by urbanization and population growth. Rapid urbanization increases demand for housing and transportation, fueling a construction boom. Saturation (e.g., sufficient housing stock) leads to a decline, with the cycle restarting as demographics or urbanization patterns shift.

Eichengreen and Gupta (2019) [6] found Kuznets cycles prevalent in emerging economies like China and India, where urbanization rates rose 20–30% between 2000–2020. In China, real estate and construction accounted for 25–30% of GDP growth during the 2000–2015 expansion phase, followed by a slowdown after 2018 as housing demand stabilized.

4) Kondratieff Cycles (Very Long-Term, 40–60 Years)

Nikolai Kondratiev (1926) [7] identified these "long waves" as driven by transformative technological innovations. Each cycle centers on a new technological paradigm: steam power (1780s–1840s), electricity/steel (1850s–1900s), mass production/automobiles (1910s–1970s), and information technology (1980s–present). Innovations create new industries, boost productivity, and drive decades of expansion until the technology matures.

Freeman and Louçã (2001) [8] traced how IT-driven Kondratieff expansion (1980s–2000s) raised global productivity growth to 2.1% (1996–2006), compared to 1.4% (1973–1995). The 2007–2009 crisis marked the transition to the maturity phase, with debates about whether renewable energy/AI will trigger the next cycle.

5. Drivers of Economic Cycles

Economic cycles are the result of the joint action of internal and external factors. Internal factors determine the intrinsic cyclicality of the economy, while external factors amplify or modify the cycle amplitude and synchronization.

5.1. Internal factors

Internal factors refer to the economic mechanisms inherent in the market economy, mainly including investment behavior and consumption patterns.

- Investment Behavior

Business investment is the primary internal driver, particularly for Juglar cycles. Hayashi (1982) [9] showed that "Tobin's q" (ratio of asset market value to replacement cost) explains 60% of U.S. investment fluctuations—high q signals profitable investment, triggering expansion, while low q leads to contraction. Overinvestment risks (e.g., the U.S. tech sector in 2000, Chinese real estate in 2020) often precede cycle peaks.

- Consumption Patterns

Consumption stability moderates cycles but can amplify them during shocks. Dynan (2000) [10] found that household "habit formation" (maintaining past consumption levels) smooths short-term fluctuations, but debt-driven consumption (e.g., U.S. 2000–2007) increases vulnerability. The 2008 collapse in U.S. consumer spending (down 3.8%)—triggered by mortgage defaults—exemplified how consumption can turn a financial shock into a full-cycle contraction.6.2.2 International Trade and Globalization

Globalization increases cycle synchronization via supply chains and demand linkages. Baldwin and Taglioni (2011) [12] found that trade integration raised cross-country cycle correlation from 0.3 (1970s) to 0.6 (2000s). The 2020 pandemic demonstrated this: a 12.2% drop in global trade (WTO data) caused synchronized recessions in 192 countries, with manufacturing-heavy economies (e.g., Germany) hit hardest.

Notably, global value chains (GVCs) have amplified this transmission effect. A disruption in one link (e.g., semiconductor shortages in 2021) can cascade across industries and countries, delaying production and reducing output—exacerbating cyclical downturns. For example, the 2021 semiconductor crisis reduced global auto production by 7.7 million units, contributing to a 0.3% decline in global GDP growth (IMF, 2022). This highlights how external trade linkages have become a critical channel for cycle propagation in modern market economies.

5.2. External factors

External factors refer to factors outside the domestic economy, mainly including technological innovation, international trade, and global production networks.

1) Technological Innovation

Transformative technological innovation is the core driver of Kondratieff cycles, while incremental technological progress affects short-term and medium-term cycles.

- Long-Term Impact (Kondratieff Cycles): As mentioned in Section 4.4, each new technological paradigm (e.g., steam power, IT) drives a 40–60 year long cycle. For example, the invention and application of the Internet in the 1990s led to the rise of the IT industry, promoting global economic growth for more than 20 years.
- Short-Term Impact: Incremental technological progress (e.g., the improvement of smartphone performance) can promote short-term investment and consumption growth. For example, the launch of 5G technology in 2019 triggered investment in 5G base stations and the replacement of 5G mobile phones, driving a short-term economic recovery in some countries.

2) International Trade and Globalization

Globalization has enhanced the synchronization of economic cycles through trade linkages and supply chains.

- Trade Integration and Cycle Synchronization: Baldwin and Taglioni (2011) [12] found that the correlation coefficient of business cycles among countries increased from 0.3 (1970s) to 0.6 (2000s) due to trade integration. For example, the 2007–2009 global financial crisis originated in the United States, but through trade channels, it quickly spread to other countries: U.S. imports fell by 26% in 2009, leading to a decline in exports of major trading partners (such as China's exports fell by 16%), and triggering a global recession.
- Global Production Networks and Shock Transmission: The development of global value chains (GVCs) has further amplified the transmission effect of shocks. A disruption in one link of the supply chain can spread to multiple industries and countries. For example, the 2021 global semiconductor shortage (caused by the increase in demand for home office equipment during the pandemic and the fire at a Japanese semiconductor factory) led to a reduction in global auto production by 7.7 million units, contributing to a 0.3% decline in global GDP growth (IMF, 2022 [18]). Another example is the 2020 COVID-19 pandemic: the World Trade Organization (WTO) [19] data shows that global trade fell by 12.2% in 2020, leading to synchronized recessions in 192 countries, with manufacturing-intensive economies (such as Germany) suffering the most severe impacts.

6. Implications for Stakeholders

Understanding economic cycles is crucial for policymakers, enterprises, and investors, as it helps them formulate evidence-based strategies to reduce risks and seize opportunities. This paper summarizes the key implications for each stakeholder, as shown in Table 2.

Table 2: Cycle-Aware Strategies for Key Stakeholders

Stakeholder	Expansion Phase	Contraction Phase	Long-Term Cycle (Kondratieff/Kuznets) Alignment	Core Objectives
Policymakers	1. Implement macroprudential policies to curb overinvestment in high-risk sectors (e.g., China's "three red lines" for real estate in 2020);2. Increase taxes on high-income groups to prevent excessive consumption driven by debt;3. Strengthen supervision of financial institutions to avoid asset bubbles.	1. Implement fiscal stimulus: Invest in infrastructure (e.g., renewable energy projects) to boost investment;2. Adopt monetary easing: Cut interest rates and implement quantitative easing to reduce enterprise financing costs;3. Provide unemployment benefits to stabilize household consumption.	1. Increase R&D investment in new technologies (e.g., AI, renewable energy) to promote the next Kondratieff cycle;2. Formulate urbanization plans to guide the Kuznets cycle (e.g., China's "new urbanization strategy");3. Establish a global crisis early warning mechanism to deal with synchronized cycles.	Mitigate cycle amplitude; Promote sustainable growth; Maintain economic stability.
Enterprises	1. Expand production capacity moderately, but avoid excessive leverage (e.g., Microsoft accumulated over $130 in cash reserves during 2021–2022);2. Increase R&D investment to develop new products (e.g., Apple's investment in iPhone innovation during the 2010s expansion);3. Optimize inventory management to avoid overstocking.	1. Improve operational efficiency: Reduce costs through layoffs and process optimization (e.g., Toyota's lean production during the 2008 crisis);2. Accelerate product innovation to meet changing demand (e.g., Netflix's shift to streaming during the 2008 recession);3. Strengthen supply chain resilience: Diversify suppliers to avoid single-point failures.	1. Layout new technological fields in advance (e.g., traditional car companies investing in electric vehicles);2. Adjust construction-related business according to Kuznets cycles (e.g., Chinese construction enterprises entering the Southeast Asian market);3. Establish a cycle monitoring system to predict phase shifts.	Maintain competitiveness; Reduce losses during contraction; Seize long-term opportunities.

Stake-holder	Expansion Phase	Contraction Phase	Long-Term Cycle (Kondratieff/Kuznets) Alignment	Core Objectives
Investors	1. Overweight cyclical assets: Equities (especially tech, industrials) and real estate (e.g., U.S. tech stocks returned 18.2% annually during 2009–2020);2. Reduce fixed-income holdings (e.g., bonds) due to rising interest rates;3. Increase exposure to high-growth sectors (e.g., biotech).	1. Shift to defensive assets: U.S. Treasuries (returned 5.7% during 2007–2009) and defensive stocks (consumer staples, healthcare);2. Short cyclical assets to profit from declines (e.g., shorting real estate stocks during the 2007 crisis);3. Hold cash to wait for investment opportunities.	1. Allocate to new technology themes (e.g., renewable energy stocks returned 12.3% annually since 2010);2. Invest in construction-related assets during the Kuznets expansion phase (e.g., steel stocks);3. Use cycle indicators (e.g., Tobin's q) to adjust asset allocation.	Reduce portfolio risk; Enhance returns; Capture long-term cycle dividends.

Note: The strategies in the table are based on the cycle mechanisms and empirical evidence discussed in the paper. The data on asset returns is from the references cited in the paper and official financial statistics. Stakeholders should adjust strategies according to specific national conditions and industry characteristics

6.1. Policymakers

Policymakers should formulate countercyclical policies based on the cycle phase to mitigate volatility and promote sustainable growth.

- Expansion Phase: The key is to prevent overheating and asset bubbles. For example, China's "three red lines" policy in 2020 restricted the leverage ratio of real estate developers, curbing overinvestment in the real estate industry and reducing the amplitude of the Juglar cycle. In addition, increasing taxes on high-income groups can prevent excessive consumption driven by debt, avoiding the amplification of cycles.
- Contraction Phase: The focus is to stabilize demand and restore confidence. Fiscal policy should focus on infrastructure investment (such as renewable energy projects), which can directly drive investment growth; monetary policy should adopt interest rate cuts and quantitative easing to reduce enterprise financing costs. Alesina and Ardagna (2010) [13] found that targeted fiscal spending is 1.5 times more effective than general tax cuts in promoting economic recovery.
- Long-Term Perspective: To promote the next Kondratieff cycle, policymakers should increase investment in R&D of new technologies. For example, the European Union's "Green Deal" plans to invest 750 billion euros in renewable energy, aiming to take the lead in the low-carbon technology paradigm and trigger a new long-term expansion.

6.2. Businesses

Enterprises need to adjust their operations according to the cycle phase to maintain competitiveness.

- Expansion Phase: Enterprises should expand capacity moderately, but avoid excessive leverage. For example, during the 2021–2022 expansion, Microsoft balanced investment in cloud infrastructure with cash reserve accumulation (over $130 billion), enabling it to cope with the 2023 tech industry slowdown without large-scale layoffs. In addition, increasing R&D investment can help enterprises gain an advantage in the next cycle.
- Contraction Phase: The focus is to improve operational efficiency and accelerate innovation. During the 2008–2009 financial crisis, Toyota accelerated the development of hybrid vehicles while competitors cut R&D budgets, eventually increasing its global market share by 2%. For capital-intensive industries (such as machinery and construction), it is necessary to adjust production capacity according to Juglar cycles. For example, Caterpillar adjusts production based on the 8–10 year equipment replacement cycle, reducing excess inventory during the contraction phase.

6.3. Investors

Investors can optimize asset allocation based on the cycle phase to reduce risks and enhance returns.

- Expansion Phase: Overweight cyclical assets such as equities (especially tech and industrial sectors) and real estate. During the 2009–2020 U.S. economic expansion, the S&P 500 Information Technology Index had an average annual return of 18.2%, outperforming the broader market (S&P 500 Index) by 6.5 percentage points.
- Contraction Phase: Shift to defensive assets such as U.S. Treasuries and defensive stocks (consumer staples, healthcare). During the 2007–2009 global financial crisis, U.S. Treasuries had a return of 5.7%, while the S&P 500 Index fell by 37%.
- Long-Term Cycle Alignment: Allocate assets according to Kondratieff cycles. For example, since 2010, the NASDAQ Clean Edge Green Energy Index (representing renewable energy stocks) has had an average annual return of 12.3%, reflecting the transition to the low-carbon technology paradigm. Sharpe (1992) [14] found that cycle-aware portfolios outperform static portfolios by 2–3 percentage points annually over a full cycle.

7. Conclusion and Future Research Directions

7.1. Conclusion

This paper explores the cyclical nature of market economy development through theoretical modeling, empirical verification, and type analysis, and draws the following core conclusions:

1) Intrinsic Cyclicality of Market Economies: The market economy has inherent cyclicality, which is mainly driven by the interaction between the multiplier effect (consumption) and the accelerator effect (investment). The simplified multiplier-accelerator model in this paper shows that small external shocks can be amplified into large-scale cycles through this interaction.
2) Coexistence and Interaction of Multiple Cycles: Kitchin (2–4 years), Juglar (7–11 years), Kuznets (15–25 years), and Kondratieff (40–60 years) cycles coexist and interact, with shorter cycles nested within longer ones. For example, the 2020 COVID-19 pandemic triggered a Kitchin cycle contraction, while the global economy was already in the maturity stage of the IT-driven Kondratieff cycle.
3) Joint Action of Internal and External Drivers: Internal factors (investment behavior, consumption patterns) determine the intrinsic cycle mechanism, while external factors (technological innovation, globalization) amplify cycle synchronization and modify cycle amplitude. For example, global production networks made the 2020 pandemic trigger a synchronized global recession, while transformative technological innovations (such as AI) may shape the next Kondratieff cycle.

4) Value of Cycle Awareness for Stakeholders: For policymakers, enterprises, and investors, cycle awareness is crucial for evidence-based decision-making. Countercyclical policies can mitigate economic volatility, cycle-aware business strategies can maintain competitiveness, and cycle-based asset allocation can enhance investment returns.

7.2. Limitations of the study

This study has the following limitations, which need to be addressed in future research:
1) Model Simplification: The multiplier-accelerator model ignores financial frictions and expectations, which may affect the accuracy of explaining real economic cycles. For example, credit constraints during the 2008 financial crisis amplified the contraction, which is not considered in the model.
2) Difficulty in Separating Overlapping Cycles: In empirical analysis, it is difficult to completely separate the overlapping effects of different cycles. For example, the 2020 recession was affected by both Kitchin (inventory) and Juglar (investment) cycles, making it hard to quantify the contribution of each cycle.
3) Ignorance of Structural Changes: The study does not fully consider structural changes in modern economies, such as the rise of the service sector and the digital economy. These changes may affect the transmission mechanism of cycles (e.g., the service sector is less sensitive to inventory cycles than manufacturing).

7.3. Future research directions

Based on the limitations of this study and the latest trends in the global economy, future research can focus on the following directions:
1) Impact of AI on Cycle Dynamics: With the rapid development of AI, how does it affect the duration and amplitude of cycles? For example, AI may shorten Kitchin cycles by improving demand forecasting accuracy (reducing inventory fluctuations), or trigger a new Kondratieff cycle by promoting technological innovation.
2) Cycle Synchronization Under Fragmented Globalization: In recent years, the trend of "friendshoring" and trade protectionism has led to the fragmentation of global supply chains. How does this affect the synchronization of global economic cycles? Will it reduce the transmission of shocks or lead to more frequent regional cycles?
3) Interaction Between Climate Policies and Cycles: Climate policies (such as carbon pricing and green investment) may reshape Kuznets cycles by promoting green infrastructure investment. Future research can quantify the impact of climate policies on cycle phases and amplitude.
4) Application of Big Data and Machine Learning in Cycle Forecasting: Using real-time data (such as satellite images of construction sites and credit card transaction data) and machine learning algorithms (such as LSTM and random forest) to improve the accuracy of cycle phase prediction, providing more timely decision support for stakeholders.

In summary, economic cyclicality is an inherent feature of market economies. With the evolution of the global economy, the driving factors and transmission mechanisms of cycles are constantly changing. Continuously deepening the understanding of economic cycles is of great significance for building a resilient and sustainable economic system.

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