

The Hindu Important News Articles & Editorial For UPSC CSE

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The **2025 Nobel Prize in Physics** has been awarded to **John Clarke, Michel Devoret, and John Martinis** for their pioneering work in demonstrating **quantum tunnelling** using an **engineered electrical circuit**. Their research deepens our understanding of **quantum mechanics**, the branch of physics dealing with matter and energy at atomic and subatomic levels.

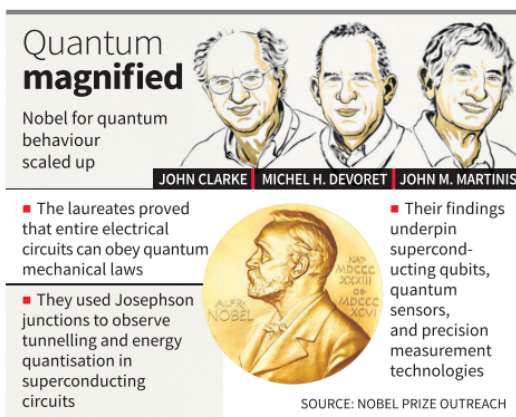
This discovery not only reinforces the foundations of **quantum theory** but also strengthens the technological base for the ongoing **quantum revolution**—including **quantum computing** and **quantum communication**.

Trio wins the Physics Nobel prize for building device that demonstrates 'quantum tunnelling'

Jacob Koshy
NEW DELHI

The Nobel Prize for Physics this year will be awarded to three scientists – John Clarke, Michel Devoret and John Martinis, the Royal Swedish Academy of Sciences said on Tuesday. The three worked together and devised experiments to tease greater insight into the workings of the quantum world: the realm of the ultra-small when objects, broken down to single, constituent particles, cease to behave in the way we ordinarily expect them to.

One of the mind-boggling behaviours that particles are capable of here is “tunnelling”, literally, the



ability of particles to pass through physical walls.

It is as if a cricket ball hitting the pitch will surely bounce up, but the odd cricket-ball particle will simply burrow into the

ground.

Such strange behaviour cannot be observed at the macroscopic level but these scientists showed that it was possible to organise a multitude of single

particles and coerce them to exhibit “tunnelling” properties.

Electrical circuit

Much like early insight into quantum mechanics paved the way for transistors and silicon chips in the 1950s, the three scientists devised an electrical circuit with two superconductors, components that can conduct a current without any electrical resistance.

They separated these with a thin layer of material – called a Josephson junction – that did not conduct any current at all.

In this experiment, they showed that they could control and investigate a phenomenon in which all the charged particles in the

superconductor behave in unison, as if they are a single ‘particle’ that fills the entire circuit. Following this, they were able to demonstrate that such a particle could be made to behave simulating the flow of electricity even without voltage, a prerequisite for the flow of current.

“It is wonderful to be able to celebrate the way that century-old quantum mechanics continually offers new surprises. It is also enormously useful, as quantum mechanics is the foundation of all digital technology,” said Olle Eriksson, Chair of the Nobel Committee for Physics.

EDITORIAL ON
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What is Quantum Tunnelling?

- **Quantum tunnelling** is a phenomenon where particles can **pass through a barrier** that they **classically shouldn't be able to cross**.
- For example, in classical physics, a ball cannot pass through a wall. But at the quantum level, a particle can “tunnel” through an energy barrier due to the **probabilistic nature of quantum mechanics**.
- This effect has real-world applications in **semiconductors, tunnel diodes, scanning tunnelling microscopes, and nuclear fusion** processes in stars.

About the Nobel-winning Work

- The trio constructed a **quantum electrical circuit** made of **two superconductors** separated by a thin **non-conducting layer**, known as a **Josephson junction**.
- This arrangement allows **Cooper pairs** (pairs of electrons) to move through the barrier **without resistance**, showcasing quantum tunnelling on a macroscopic scale.
- Their experiment demonstrated that **quantum coherence** — where particles act as a single unified entity — can be manipulated in engineered systems.
- This is a key step toward **quantum bits (qubits)** used in **quantum computers**.

Static Linkages (UPSC Static Syllabus Context)

1. **Quantum Mechanics (Physics concept):** Originated in the early 20th century through the works of Planck, Einstein, Bohr, Schrödinger, and Heisenberg. Quantum tunnelling was first theorized in the 1920s to explain **alpha decay** in radioactivity.
2. **Josephson Junction:**
 - Proposed by **Brian Josephson** in 1962 (Nobel Prize in 1973).
 - Basis for **SQUIDS (Superconducting Quantum Interference Devices)** used in magnetic field detection and quantum circuits.
3. **Superconductivity:**
 - A phenomenon where materials conduct electricity with **zero resistance** below a certain temperature.
 - Discovered by **Heike Kamerlingh Onnes** in 1911 (Nobel Prize in 1913).

Current Relevance

- This discovery strengthens the foundation for **quantum technologies**, a major thrust area in global research and policy.
- India launched the **National Quantum Mission (NQM)** in **2023**, aiming to build quantum computers, secure communication systems, and advanced sensors by 2031.
- The Nobel-winning research is relevant for **quantum computing hardware**, where controlling quantum tunnelling and coherence is essential to build **stable and error-resistant qubits**.

Significance

- **Scientific:** Enhances understanding of **macroscopic quantum systems** and provides deeper experimental validation of quantum theory.
- **Technological:** Lays groundwork for **quantum processors, quantum internet, and next-gen AI chips**.
- **Economic:** Accelerates the **quantum economy**, expected to transform cybersecurity, computation, and materials research.

Conclusion

The 2025 Nobel Prize in Physics reaffirms that **quantum mechanics**, even a century after its birth, continues to unveil new phenomena and practical innovations. The work of Clarke, Devoret, and Martinis bridges the gap between **theoretical physics** and **applied quantum engineering**, marking a milestone toward the realization of the **quantum age** — where the mysterious rules of the microscopic world are harnessed for macroscopic technological advancement.

UPSC Prelims Practice Question

Ques: Which of the following statements about “Quantum Tunnelling” is/are correct?

1. It is possible only at high temperatures.
2. This phenomenon cannot be explained by classical physics.
3. It can be used in quantum computers.

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) All of the above

Ans: b)

UPSC Mains Practice Question

Ques: Analysis of the scientific, economic, and ethical principles associated with the rapid development of quantum. **(250 Words)**



India's pharmaceutical industry is often hailed as the "pharmacy of the world", supplying affordable medicines globally. However, recent incidents of **adulterated and substandard drugs** have exposed weaknesses in the country's **drug regulatory and quality assurance mechanisms**.

A recent Health Ministry source confirmed that **no State drug authority has fully complied with Corrective and Preventive Action (CAPA) guidelines**, even though **18 States have adopted the Online National Drugs Licensing System (ONDLS)** — both critical components of the revised **Schedule M** under the **Drugs and Cosmetics Rules, 1945**.

Background: Schedule M and Revised GMP Norms

- **Schedule M** outlines **Good Manufacturing Practices (GMP)** for pharmaceutical manufacturing in India.
- It ensures that drugs are **consistently produced and controlled** according to **quality standards** appropriate to their intended use.
- In **2023**, the government **revised Schedule M** to strengthen manufacturing and regulatory oversight, especially in the wake of international drug quality concerns (such as the **Gambia and Uzbekistan cough syrup deaths**).

Key Elements: CAPA and ONDLS

1. Corrective and Preventive Action (CAPA):

- A **universal quality management tool** used to identify, investigate, and resolve root causes of **non-compliance or quality failures**.
- Ensures that **corrective measures** are taken to prevent recurrence of manufacturing lapses.
- Critical for **continuous process improvement** and **consumer safety**.
- Currently, **no State** has achieved full compliance with CAPA norms — a major concern for **drug quality enforcement**.

2. Online National Drugs Licensing System (ONDLS):

- A **digital, single-window platform** developed by **C-DAC** and the **Central Drugs Standard Control Organization (CDSCO)**.
- Handles applications for **manufacturing, sales licences, blood banks, and WHO-GMP certificates**.
- Aims to ensure **uniformity, transparency, and accountability** across States in drug licensing.
- So far, **18 State authorities** have adopted it.

'No State has fully complied with key drug quality norms'

Bindu Shajan Perappadan
NEW DELHI

While 18 State drug control authorities across the country have adopted the Online National Drugs Licensing System (ONDLS) for processing drug-related licences, no State has yet fully complied with the Corrective and Preventive Action (CAPA) guidelines, confirmed a source in the Union Health Ministry.

Both the ONDLS and CAPA are provisions under the Central government's revised Schedule M, which is a critical update to India's pharmaceutical manufacturing regulations.

Safety standards

"CAPA is crucial for ensuring safety and maintaining high standards in regulated industries such as pharmaceuticals. It is a universal quality management methodology for process improvement," the official said.

Voluntary compliance [with CAPA] is crucial for quality maintenance, he said, while speaking about the recent deaths of children in Madhya Pradesh and Rajasthan due to consumption of adulterated cough syrup.

CAPA also focuses on systematically investigat-

CAPA guidelines form a critical part of Centre's revised pharmaceutical manufacturing regulations

ing and resolving problems in management issues. "Compliance with CAPA will ensure that drug violation is registered and corrective action is taken," the official said.

The ONDLS is a digital, single-window platform for processing various drug-related licences in India and has been developed by the Centre for Development of Advanced Computing in coordination with the Central Drugs Standard Control Organization (CDSCO).

"The system is designed to create a uniform, transparent, and accountable process for drug licensing across all States and Union Territories. It handles applications for manufacturing and sales licences, blood banks, and various certificates, such as WHO-GMP," said the official.

Data shared with *The Hindu* show that of the total 5,308 MSME pharma companies in India, 3,838 have already complied with the revised Schedule M GMP.

Current Situation and Data

- India has **5,308 MSME pharma companies**, of which **3,838** have complied with revised **Schedule M GMP** norms.
- However, compliance with **CAPA** remains incomplete nationwide.
- The issue gained attention following **child deaths in Madhya Pradesh and Rajasthan** due to **adulterated cough syrups**, highlighting the urgent need for robust enforcement of **drug quality controls**.

Static Linkages

1. **CDSCO (Central Drugs Standard Control Organization)**: India's apex regulatory body under the **Drugs and Cosmetics Act, 1940**, responsible for drug approval, quality control, and pharmacovigilance.
2. **Good Manufacturing Practices (GMP)**: Internationally recognized guidelines under **WHO** to ensure pharmaceutical products are safe, pure, and effective.
3. **Regulatory Federalism**: Drug regulation is a **shared responsibility** — the **Centre frames policy and standards**, while **States issue licences and conduct inspections**.

Significance and Issues

Significance:

- Enhances **consumer safety, public health, and global trust** in Indian medicines.
- Promotes **ease of doing business** and digital governance through **ONDLS**.
- Aligns Indian pharma with **global GMP standards**, crucial for exports.

Issues and Challenges:

- Lack of **uniform implementation** across States.
- **Regulatory capacity constraints** — shortage of trained drug inspectors.
- Weak enforcement of **CAPA** leading to recurring drug quality failures.
- Limited digital literacy and infrastructure at State drug offices.

Way Forward

- **Strengthen CDSCO–State coordination** and harmonize regulatory frameworks.
- **Capacity building** for inspectors and pharma MSMEs to implement CAPA effectively.
- **Mandatory digital adoption** of ONDLS across all States for end-to-end transparency.
- **Periodic audits** and third-party assessments to ensure continuous compliance.
- Accelerate **National GMP Compliance Programmes** under the **Pharma Vision 2047**.

Conclusion

India's pharmaceutical success must rest on a foundation of **quality, safety, and transparency**. The lack of full compliance with **CAPA** despite progress in **ONDLS** adoption signals a gap between **policy intent and implementation capacity**. Strengthening regulatory oversight through **digital tools, accountability mechanisms, and uniform enforcement** is vital to protect public health and sustain India's global reputation as a reliable drug manufacturer.

UPSC Prelims Practice Question

Ques: Which of the following statements is correct?

1. The CAPA (Corrective and Preventive Action) system is related to drug quality control.
2. The Online National Drugs Licensing System (ONDLS) has been developed by the Central Drugs Standard Control Organization (CDSCO).
3. Schedule M is related to the pricing process of drugs in India.

Select the correct answer from the code given below:

- (A) 1 and 2 only
- (B) 2 and 3 only
- (C) 1 and 3 only
- (D) 1, 2, and 3

Ans: (a)

UPSC Mains Practice Question

Ques:What are the challenges in drug quality regulation for India to maintain its reputation as the "pharmacy of the world"? How can recent reforms like CAPA and ONDLS help in this direction? **(150 Words)**



A *supermoon* is a celestial event that occurs when a **full moon** or **new moon** coincides with the **moon's closest approach (perigee)** to the Earth in its elliptical orbit. This makes the moon appear **larger and brighter** than usual. The term was popularized by astrologer **Richard Nolle in the 1970s**, and though informal, it is now widely accepted in astronomy and media.

Static Context:

- The **Moon's orbit** around Earth is elliptical, causing the distance between them to vary by about **50,000 km**.
- The **perigee** is the closest point (~363,000 km from Earth), while the **apogee** is the farthest (~405,000 km).
- When the full moon occurs near perigee, it appears **up to 14% larger** and **30% brighter** than a normal full moon.
- This enhanced appearance is due to the **optical illusion** created when the moon is seen close to the horizon and due to its physical proximity.

Current Context (October–December 2025):

- A **supermoon** was visible on **October 7, 2025**, and two more are expected in **November and December**.
- Such events are often used by astronomers for **public engagement, lunar surface observations, and tidal studies**.
- Supermoons can cause **perigean spring tides**, where the **moon's stronger gravitational pull** slightly increases **high and low tides**, sometimes worsening **coastal flooding** when combined with storm surges.

Cultural and Environmental Significance:

- Supermoons have held symbolic value in many cultures, often associated with **festivals, folklore, and spirituality**.
- They also provide excellent opportunities for **science communication** and **public outreach** in astronomy.

Conclusion:

The supermoon is not just a visually captivating astronomical event but also a natural phenomenon that reflects the **dynamic Earth-Moon system**. While its physical effects on Earth are modest, its **cultural, scientific, and environmental** significance makes it an important event linking **celestial mechanics with human imagination**.

WHAT IS IT?

What is a supermoon?

Vasudevan Mukunth

A supermoon occurs when a full moon or new moon coincides with the moon's closest approach to the earth in its elliptical orbit — a point known as the perigee. Because the moon's orbit is not a perfect circle, its distance from the earth varies throughout the month by around 50,000 km. When the moon is near its perigee and also directly opposite the sun, the full moon appears about 14% larger and 30% brighter than when it is at its farthest point. This is the supermoon.

A supermoon was visible on the night of October 7 and will appear twice more in November and December. The astrologer Richard Nolle popularised the term 'supermoon' in the 1970s, but it has since been adopted by astronomers and the media to describe the visually striking lunar events. Though the difference in size is subtle to the naked eye, the enhanced brightness often makes the moon appear vivid against the night sky, especially when seen low on the horizon. Supermoons also influence the



A full moon sets behind Stonehenge in April 2021, in Amesbury, England. GETTY IMAGES

tides, creating perigean spring tides. These tides are slightly higher and lower than usual because the moon's stronger gravitational pull acts in concert with that of the sun. While the changes are typically modest, they can exacerbate coastal flooding when combined with storm surges. Culturally, supermoons have long captured human imagination, inspiring folklore and spiritual observances across civilisations. They also offer opportunities for astronomers and photographers to observe lunar surface details and study tidal effects more clearly.

For feedback and suggestions for 'Science', please write to science@thehindu.co.in with the subject 'Daily page'

UPSC Prelims Practice Question

Ques: The "Perigean Spring Tides" that occur during a supermoon are caused by—

- A.** The combined effect of the gravitational forces of the Moon and the Sun
- B.** A decrease in the Earth's rotational speed
- C.** An increase in ocean salinity
- D.** The effect of a lunar eclipse

Ans: a)



Maoist insurgency, often referred to as Naxalism, has been one of the most persistent internal security challenges for India since the late 1960s. Rooted in the ideology of armed revolution to overthrow the state, the movement initially emerged as a peasant-led struggle in West Bengal and later spread to Andhra Pradesh, Bihar, Jharkhand, Odisha, and Chhattisgarh.

Over the decades, the insurgency evolved into a coordinated armed rebellion under the banner of the Communist Party of India (Maoist), controlling vast forested areas known as 'Liberated Zones'. The Union Government has consistently deployed a combination of security measures, socio-economic initiatives, and surrender-rehabilitation policies to counter the insurgency.

It's time for Maoists to lay down arms

Recently, Union Home Minister Amit Shah ruled out talks with the Maoists and said that they will have to lay down weapons by the government's "lucrative surrender and rehabilitation policy". Reiterating that the government was firm about eradicating Maoism by next year, he asked the Maoists to surrender and join the mainstream.

It is time for the Maoists to seriously consider this offer. In the last two decades, the highest decision-making bodies of the proscribed Communist Party of India (Maoist) – the Central Committee and the Politburo – have shrunk drastically in both size and influence. In 2004, when the CPI (Marxist-Leninist) People's War Group and the Maoist Communist Centre merged to form the CPI (Maoist), there were about 42 Central Committee members, who were young intellectuals, and 10,000 cadre. Today, the Central Committee has just 13 members. Nearly all of them are over 60, fatigued, and suffer illnesses. The cadre base has reduced to below 2,000. The Politburo has shrunk from about 25 to merely 7-8 members.

It is clear that the armed rebellion has reached a dead end, and the movement, already in decline for some time, is now at its weakest. Even in their traditional stronghold in Chhattisgarh, once declared a 'Liberated Zone', the Maoist influence has waned.

The beginning of the decline
For a long time, the Maoists ruled the roost in the underdeveloped and tribal districts of combined Andhra Pradesh, Odisha, and Chhattisgarh. When Andhra Pradesh and Odisha augmented their police forces with specialised forces, the Maoists were slowly pushed into Chhattisgarh. In that forested State, they held sway for more than two decades. The 'Liberated Zone' also became a reality, as the Maoists ran a parallel government, which they called 'Janatana Sarkar'. Their



Sumit Bhattacharjee

control spread over Sukma, Dantewada, Bijapur, Narayanpur, Kanker, Rajnandgaon and Bastar.

However, the introduction of the Commando Battalion for Resolute Action, a specialised unit of the Central Reserve Police Force trained in jungle warfare and guerrilla tactics, began to change things. The deployment of the District Reserve Guard (DRG) – a counterinsurgency force comprising surrendered Maoists and former members of the disbanded Salwa Judum, which was raised by the Chhattisgarh government – also proved to be a game changer. The DRG played a crucial role in Operation Black Forest, a mission that destroyed a major Maoist stronghold and the Maoists' headquarters in the Karagutta hills. In the beginning of 2025, there were about 20 Central Committee members. Between January and June, the DRG killed five of them, including general secretary Nambala Keshava Rao alias Basavaraju.

Apart from this, in the last 18 months, security forces have also killed more than 430 Maoists, including Central Committee members, mid-level leaders, and cadres, including about 45 women operatives. Over 1,450 Maoists have surrendered and about 1,460 have been arrested. All these setbacks have substantially reduced the movement's military strength and reduced the Maoists' intellectual and political base.

A crisis of leadership
The biggest crisis confronting the Maoists is of leadership. The killing of Basavaraju brought the movement's tensions to the forefront. While nearly the entire military force comprises tribal people, especially Gonds, a dominant tribal group in Chhattisgarh, leaders of the movement have always been upper caste, primarily from Andhra Pradesh and Telangana. It was only when tensions came to the surface that the top leadership chose Telangana-based Dalit leader, Tippiri Tirupathi alias Debuji, as the new general secretary. Now, 10

Central Committee members are from Andhra Pradesh and Telangana, three from Jharkhand, and two from Chhattisgarh.

Chhattisgarh has always presented a unique case in the Maoist insurgency. Unlike West Bengal, Andhra Pradesh, or Bihar – where the movement originated and thrived as a peasant-led struggle rooted in land issues and supported by intellectuals – Chhattisgarh was not the birthplace of the movement. Instead, it was chosen by Maoists as a strategic safe haven after they were pushed out of Andhra Pradesh and Bengal. Many of the tribal people in Chhattisgarh, who have surrendered, say that they joined the movement motivated by the songs and plays enacted by the cultural wing of the Maoists and not because of ideology.

Ironically, the state-sponsored Salwa Judum movement became a blessing in disguise for the Maoists. The atrocities committed by Judum members against tribal groups drove many tribal people into the Maoist fold. However, as both sides engaged in violence, the tribal people increasingly found themselves caught in the crossfire. This led to growing disillusionment and a gradual distancing of tribal communities from the Maoist movement.

The Maoists' preference for militarisation over political development has hit the movement hard. Over the past 25 years, there has been a sharp decline in their intellectual base, overground support, and recruitment of educated youth. Combined with the modernisation of security forces, improved intelligence-sharing, and coordinated operations, this has pushed the Maoists into a corner.

This decline shows that a sustained people's movement with the backing of the civil society in a democratic way would have yielded better results than an armed struggle, such as what happened in Niyamgiri in Odisha or Sompeta in Andhra Pradesh.

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It is clear that the movement, already in decline for some time, is now at its weakest

Current Context and Analysis:

1. Decline of Maoist Strength:

- The article highlights that the CPI (Maoist) is at its weakest stage in two decades.

Daily News Analysis

- Central Committee reduced from **42 to 13 members**, Politburo from **25 to 7–8**, cadre strength from **10,000 to less than 2,000**.
 - Many leaders are over 60 and physically unfit, showing the movement's **leadership and organizational crisis**.
 - Even traditional strongholds like Chhattisgarh have seen a marked decline in Maoist influence.
2. **Role of Security Operations:**
- Specialised forces like **Commando Battalion for Resolute Action (CoBRA)** and **District Reserve Guard (DRG)** have successfully weakened the Maoists.
 - Operations like **Black Forest** eliminated key strongholds and leaders, including general secretary Nambala Keshava Rao.
 - Over **430 Maoists killed** and **1,450 surrendered** in recent years show the effectiveness of coordinated counterinsurgency measures.
3. **Leadership Crisis and Ethnic Tensions:**
- Traditional top leadership remains **non-tribal (mostly from Andhra Pradesh and Telangana)**, while the military force largely comprises **tribal Gonds**.
 - Recent appointment of Telangana-based Dalit leader Tippi Tirupathi as general secretary reflects both **internal tensions** and **attempt to maintain control**.
 - Tribal communities, initially mobilized culturally rather than ideologically, are now distancing themselves due to violence and disillusionment.
4. **Failure of Militarisation over Political Development:**
- Preference for armed struggle over civil-political engagement has **eroded intellectual and youth support**.
 - Past civil society-backed struggles (e.g., Niyamgiri in Odisha, Sompeta in Andhra Pradesh) show **peaceful democratic avenues** can yield better results than militarized insurgency.
 - Modernisation of security forces, improved intelligence, and coordinated operations have cornered Maoists, limiting both recruitment and ideological propagation.
5. **Government Strategy:**
- Union Home Minister Amit Shah's statement emphasizes **surrender and rehabilitation policies** as a pathway for Maoists to join the mainstream.
 - The approach combines **hard power (security operations)** with **soft power (incentives, rehabilitation, development)**—reflecting India's counterinsurgency doctrine.

Static Context

- **Naxalism/Maoism:** A left-wing extremist movement inspired by Mao Zedong's ideology; aims to establish a "people's government" through armed struggle.
- **Key Areas Affected:** Red Corridor – Chhattisgarh, Jharkhand, Odisha, Maharashtra, Bihar, Andhra Pradesh.
- **Counter-Insurgency Forces:** CoBRA, Greyhounds (AP), DRG (Chhattisgarh).
- **Government Policies:** Surrender and rehabilitation schemes, socio-economic development in affected districts, and coordinated operations.
- **Judicial & Legislative Measures:** UAPA (Unlawful Activities Prevention Act), ban on CPI (Maoist) in 2009.

Current Relevance

- Declining influence of Maoists indicates **success of combined security and development strategy**.
- Highlights importance of **civil society engagement and tribal welfare** in counterinsurgency.
- Demonstrates **interplay between internal security and socio-political factors**.

Conclusion:

The Maoist insurgency in India, once a formidable armed rebellion, is now witnessing an irreversible decline due to **leadership crises, reduced cadre strength, strategic security operations, and waning tribal support**. The Union Government's approach of combining **hard and soft power**—security measures alongside surrender and rehabilitation schemes—offers a sustainable path to integrate insurgents into mainstream society. The trajectory of Maoism in India underscores the lesson that **people-centric democratic and developmental strategies are more effective than prolonged armed struggle**. For aspirants, this provides a clear example of how ideology, socio-economic factors, and governance interact in shaping internal security outcomes.

UPSC Prelims Practice Question

Ques : What did "Janatana Sarkar" stand for?

- A) The public administration of the Indian Congress
- B) The parallel administration of the Maoist movement
- C) The administration of the Jharkhand government
- D) The Panchayat model of state government

Ans: B)

UPSC Mains Practice Question

Ques: How does the role of tribal communities in the Maoist movement and their changing perspectives affect the strengths and weaknesses of this movement? **(150 Words)**



The global economy is currently facing heightened uncertainty due to rising tariffs, trade wars, and disruptions in international trade flows. For India, which is increasingly integrated into the global economy, this scenario poses both risks and opportunities. The role of **domestic capital** becomes critical in maintaining growth momentum, ensuring equitable development, and stimulating domestic demand, especially in the wake of subdued external demand. Indian business houses are now urged to align with national priorities rather than focus solely on profit maximization.

Why Indian capital needs to invest domestically

As the global economy now moves to an extended period of uncertainty, due to tariffs and fluctuations in world trade, India's private business houses have to work closely with the government and align with public interest to maintain the economy's growth momentum

ECONOMIC NOTES

M. Suresh Babu

A central challenge for policy makers in India, at the present juncture, is to work out a balance between the long-term benefits of global trade and the short-term harms that current uncertainties pose to large sections of the population who are at risk of low wages and unemployment. Tackling this requires a change of the existing system to account for the needs of the larger masses rather than only enriching private capital's interests.

The evolution of capital

Indian capital has an important role to play in this change by becoming more inclusive of a broader set of interests beyond individual profits and rapid accumulation. The history of capitalism shows that this is not impossible as capitalism has evolved before, and if it is to continue into the future, it can evolve again. As the economy is at risk of negative shock to external demand for its products, due to unprecedented tariffs imposed and distortions caused in the global trading system, Indian capital needs to reinvent itself and work closely with the government to mitigate the risks posed.

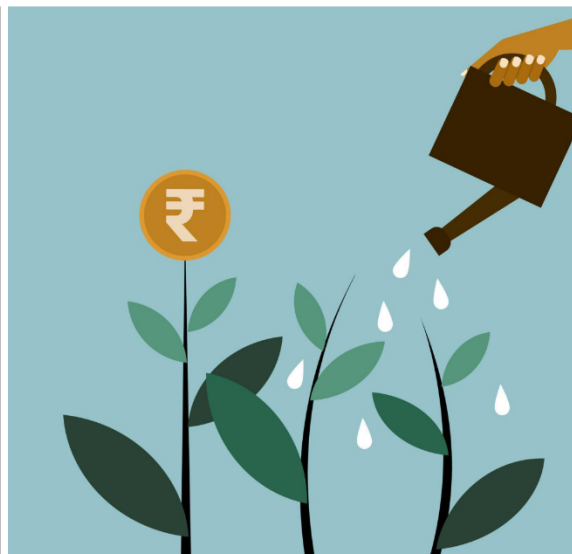
Historically private businesses, managed by Indian capital, have clamoured for a more active role in the economy as well as larger concessions and subsidies along with a liberal business environment. Governments have often been called on to command and control such businesses. These private enterprises used India's protected economic environment (pre-liberalisation) to grow and accumulate by riding on inward-looking policies and reaping supernormal profits (excess of normal profit) from protected domestic markets. The accumulated surpluses gave them the confidence to cross borders, buy out businesses elsewhere and forge global links when the economy opened up in the early nineties. This phenomenon, though not widespread among Indian businesses, has created depth in Indian capital, spawning some giants who control various important sectors of Indian industry.

However, as the global economy now moves to an extended period of uncertainty, these business houses now have to work closely with the government and align with public interest to maintain the economy's growth momentum.

Three key processes were instrumental in the emergence and subsequent development of nascent India in the contemporary global economy. First, the creation of a wage-labour class; second, the productivity-enhancing effects of industrial mass production; and third, changes in the composition of demand as personal incomes grew.

The growth of demand is an important but unrecognised ingredient in these processes. Firms require an expansion of demand if they are to realise profits from the production of additional goods and services. Most of the current macroeconomic policy frameworks simply assume that demand responds passively to supply, therefore the expansion of the latter is all that is of interest to growth.

In a globalised world, demand has two components, domestic and external. Early approaches to industrialisation focussed on the domestic component and later ones emphasised on the external side. The current turbulence in the global



THE GIST

As the economy is at risk of negative shock to external demand for its products, due to unprecedented tariffs imposed and distortions caused in the global trading system, Indian capital needs to reinvent itself and work closely with the government to mitigate the risks posed.

The first area for more active involvement of Indian capital is to enhance internal private investments. Despite India Inc. sitting on record-high profits, the willingness to invest hasn't kept pace with such profits.

While the government has been facilitating the creation of a favourable environment for businesses, that effort alone is not sufficient for tackling present challenges.

economy has led to shocks in external demand and hence exports are impacting aggregate demand and inducing vulnerabilities and fluctuations in external demand. In this scenario turning to domestic markets, raising the levels of domestic demand and catering to it, remains a viable option.

The importance of domestic capital

In India, domestic capital has an important role to play in stimulating domestic demand via three routes.

The first area for more active involvement of Indian capital is to enhance internal private investments. Despite India Inc. sitting on record-high profits, the willingness to invest hasn't kept pace with such profits. During the post-COVID period, public investments did all the heavy lifting. Fiscal policy has been fine tuned to offer incentives, while monetary policy has been responding with easier access to credit. A bulk of the regulatory requirements have been simplified along with the tax regime. Infrastructure development has been accorded high priority along with a slew of benefits, such as production-linked incentives. The net effect of all these is reflected in the indicators of the business environment.

However, despite these efforts by the government, private investments have remained flat over the past few years. The Finance Ministry in its June monthly review noted that "Slow credit growth and private investment appetite may restrict acceleration in economic momentum," underscoring the urgent need for the private sector to step up.

While private capex remains subdued, public capital expenditure surged from ₹3.4 lakh crore in FY20 to ₹10.2 lakh crore in FY25, which is a compound annual growth rate (CAGR) of 25%, driven largely by railways, roads, highways, and communications. Interestingly, during a period of sluggish domestic private investments, India's outward foreign direct investment (FDI) flows have grown at a sharp pace over the past few years, with a CAGR of 12.6%, much higher than the global average of 3.9%. This indicates that Indian capital is keener to explore foreign locations than its domestic economy. An opportune time has come for a reversal of this.

The second thrust area is to ensure that there is moderate wage growth in the economy. The Economic Survey 2024-25 flagged the trend of increasing corporate profits and lagging wage growth. In 2023-24, profits touched a 15-year high, while growth in wages stagnated. This affects distribution in the economy and dampens domestic demand. Rating agencies project that real wage growth might decline to 6.5% in FY26, down from 7% in FY25. Real wages are expected to grow faster when inflation is low. However, we find evidence contrary to it indicating worsening of distribution. The growing trend towards contractualisation within formal sectors has been eroding the collective bargaining power of workers, leading to slower wage growth within the manufacturing sector.

The third area for priority action is to invest more in Research and Development (R&D). The tendency has been to invest less and only in areas of

quick returns. This paradigm has to change as fundamental research and development is crucial for long term productivity gains. The gross expenditure on R&D in India is 0.64% of the GDP, which is insufficient and remains low compared to many advanced economies. Further, R&D funding in India is primarily through the government. In the U.S., China, Japan, and South Korea, private enterprises routinely contribute more than 70% to the total national R&D expenditure. In China, R&D spending has reached 2.1% of the GDP, with the private sector complementing the funding of the government, while in India only around 36% of R&D is funded by the private sector. In India not only is the private sector investment in innovation low, but it is also concentrated in sectors such as drugs and pharmaceuticals, information technology, transport, defence, and biotechnology.

The road ahead

An uncertain global economic environment calls for unified responses from the government and the private sector.

While the government has been facilitating the creation of a favourable environment for businesses, that effort alone is not sufficient for tackling present challenges. Long term national interest needs to be protected by Indian capital by keeping it as an objective above profit maximisation. It is time for Indian capital to step in more actively.

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Static Context

1. Historical Evolution of Indian Capital

- Pre-liberalization, Indian businesses grew under a **protected economic environment**, benefiting from inward-looking policies and generating supernormal profits.
- Liberalization in the 1990s allowed these firms to **expand globally**, leveraging accumulated capital for cross-border investments.
- Some Indian business conglomerates became dominant in sectors like steel, automobiles, pharmaceuticals, and IT.

2. Capitalism and Domestic Demand

- Economic growth historically relies on **three factors**: creation of a wage-labour class, industrial mass production, and rising personal incomes leading to demand expansion.
- **Demand is a critical driver**: GDP growth is sustainable only when production meets effective demand.
- India's domestic demand remains underutilized; private investment is subdued despite rising corporate profits.

3. Private Investment Trends

- Post-COVID, **public investment** surged (FY20 ₹3.4 lakh crore → FY25 ₹10.2 lakh crore; CAGR 25%).
- Private investments remained **flat**, while outward FDI grew at **12.6% CAGR**, indicating preference for foreign over domestic investments.
- There is a **mismatch between corporate profits and wage growth**, affecting consumption-led domestic demand.

4. R&D Investment Gap

- India spends **0.64% of GDP on R&D**, with only 36% from private sector—much lower than countries like the US, China, Japan, and South Korea where private contributions exceed 70%.
- R&D focus is concentrated in sectors like IT, pharmaceuticals, transport, defence, and biotech, leaving other areas underdeveloped.

Current Context

1. Global Economic Uncertainty

- Trade distortions and tariffs have **reduced external demand**, making India vulnerable to shocks in exports.
- Domestic capital must step in to **stimulate internal demand**, maintain employment, and reduce economic vulnerability.

2. Policy Implications

- Government has **improved the business environment** through fiscal incentives, easier credit, production-linked incentives, and infrastructure development.
- Yet, private capital needs to **actively invest domestically**, enhance wage growth, and contribute to R&D to ensure sustainable economic development.

3. Equitable Growth and Inclusive Capitalism

- Indian capital is expected to **move beyond profit maximization**, taking into account social and economic equity.
- Moderate wage growth, increased employment, and enhanced domestic consumption are key to sustaining long-term growth.

Conclusion

In the face of global economic uncertainty, India's growth strategy must rely on **strong domestic capital investment**. Private businesses should move beyond short-term profit motives, invest in domestic markets, enhance wage growth, and fund R&D to drive **inclusive and sustainable development**. A coordinated approach between government and Indian capital is essential to maintain economic stability, strengthen domestic demand, and secure India's long-term growth trajectory.

UPSC Prelims Practice Question

Ques: Consider the following statements regarding Indian capital and domestic investment:

1. India's private sector invests only 0.64% of GDP in R&D.
2. Private investment in India is steadily increasing, while FDI flows are declining.
3. Due to global instability, India should focus on increasing domestic demand.

Correct options:

- A) Only 1 and 3 are correct
- B) Only 2 and 3 are correct
- C) Only 1 and 2 are correct
- D) All 1, 2, and 3 are correct

Ans : a)

UPSC Mains Practice Question

Ques: Evaluate the role of Indian private capital in promoting domestic economic growth amid global uncertainties. Suggest measures to enhance its contribution. **(150 Words)**

Page : 08 Editorial Analysis

A path to progress that is paved with gold

Atmanirbharta has been central to India's story, not just as an economic plan but also as a philosophy of existence. For us, self-reliance has always meant drawing strength from within so that we may stand taller in the world. Under Prime Minister Narendra Modi, India has embraced Atmanirbharta with renewed vigour, transforming ambitious ideas into tangible national achievements across sectors. His governance has propelled India's self-reliance journey, demonstrating unparalleled resilience and innovation even amid global uncertainties.

This instinct has defined India's journey: when droughts struck in the 1960s, the Green Revolution made India food secure; in the 1990s, foresight in the digital sphere turned talent into national strength; during the COVID-19 pandemic, India developed its own indigenous vaccines rapidly, showcasing scientific and manufacturing self-reliance; today, it is advancing towards self-reliance in defence systems. The lesson remains consistent: whenever India has chosen self-reliance, crisis has been turned into capability.

That principle now needs its strongest expression in financing India's growth. India has drawn over \$1 trillion in gross FDI since 2000, yet global realities are shifting. Global investment flows have shrunk by more than 11% in calendar year 2024 while international project finance deals fell by 27%. Foreign portfolio investments, while substantial, remain volatile, swayed by global tremors. As the world retreats from globalisation and the costs of capital rise abroad, India cannot afford to hinge its future on external flows. The time has come to unlock Bharat's own wealth to fuel Bharat's own growth.

A stock of immense value

The most compelling starting point is gold. For generations, gold has been both a store of value and a symbol of security in Indian households. Over time, this trust has expanded to an extraordinary scale: families in India today



Gourav Vallabh

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A revitalised, trust-based gold monetisation scheme can help India define its growth on its own terms

collectively hold close to 25,000 tonnes of gold, making this the single largest private reserve in the world. At today's prices, this translates to about \$2.4 trillion of wealth, or more than 55% of India's GDP in FY26 terms – a stock of value even larger than all the credit extended by India's banks.

Paradoxically, despite such reserves, India remains one of the largest importers of gold, meeting roughly 87% of demand from abroad, with imports accounting for 8% of its total bill. Between 2010 and 2013, gold imports made up almost a third of India's trade deficit. This paradox highlights both an enormous challenge and an unprecedented opportunity.

Because India's relationship with gold is cultural and civilisational, coercive restrictions are not the answer. What is needed instead is a revitalised, trust-based gold monetisation scheme. Unlike past experiments that faltered due to weak infrastructure and limited outreach, a reimagined scheme must build on global best practices. A striking example comes from a few nations that successfully invested in assaying facilities, created innovative gold savings products, and digitised gold flows through mobile apps, managing to bring thousands of tonnes of "under-the-pillow" gold into their formal financial system. India can adapt these lessons.

The basics

The road ahead demands three essentials. First, infrastructure – hallmarking and purity testing centres need to scale faster for trusted valuation across the country. India requires a formal network of collection and purity testing centres. Only recently has it begun expanding the reach of standardised testing: the number of Bureau of Indian Standards-registered assaying and hallmarking centres has almost doubled in the last four years. Yet, a large share of the market still consists of unbranded gold with uncertain purity, which prevents the efficient recycling of gold into the economy. Second, logistics – banks

can manage the money flows, while experienced collection and purity testing centres handle gold movement securely and transparently. Third, digitalisation – every household depositor should be able to track their "metal balance" as easily as a bank account balance. But, above all, trust is the foundation. To build it, we must remove frictions such as goods and services tax and customs scrutiny on deposits, and ensure a simple, "no questions asked" environment where returns flow back directly to depositors without hidden costs.

If structured this way, the economics are favourable. The cost of funds raised through gold monetisation could fall in the range of 4.5%-6.5%, lower than the effective cost of borrowing from international markets. Even if a fraction of India's household is mobilised, the impact would be transformative – easing import pressure, strengthening the current account and creating a vast pool of domestic capital to drive infrastructure, manufacturing and innovation.

Moment of financial self-reliance

History shows that India has always risen to moments of crisis, transforming them into capability. Just as it attained food security during the Green Revolution and global leadership in IT services during the digital age, its now stands before the call for financial self-reliance. Mobilising domestic wealth, particularly through gold, is not just an economic choice. It is a civilisational one.

This is about building the confidence that Bharat can fund Bharat, harnessing its own wealth, ingenuity, and resilience. The path forward demands trust, foresight and determination. But the prize is unmistakable – an India that defines its growth on its own terms, self-reliant in spirit and substance, and financing its aspirations from within to step boldly into the future.

The views expressed are personal

GS. Paper 3—Indian Economy

UPSC Mains Practice Question: Discuss measures to promote domestic capital investment in India amidst current global economic uncertainties. **(150 Words)**

Context :

Daily News Analysis

Self-reliance, or **Atmanirbharta**, has long been central to India's economic and civilisational ethos. From the **Green Revolution** of the 1960s to **digital transformation** in the 1990s and indigenous **COVID-19 vaccine production**, India has historically converted crises into opportunities. Today, amid a **global slowdown, shrinking FDI flows, and volatile foreign investment**, India faces a new challenge: achieving **financial self-reliance** by mobilising its own domestic wealth to drive growth.

Static Context

1. Atmanirbharta in India's Economic History

- Green Revolution → Food security.
- IT revolution → Global competitiveness in services.
- Indigenous vaccine production → Scientific and manufacturing self-reliance.
- Defence initiatives → Towards strategic self-reliance.

2. India's Domestic Gold Stock

- Indian households hold **~25,000 tonnes of gold**, valued at ~\$2.4 trillion (~55% of FY26 GDP).
- Despite this, India imports **87% of its gold**, contributing to trade deficits and external vulnerabilities.
- Gold has historically been a **store of value and cultural asset**, presenting an opportunity for domestic financing.

Current Context

1. Global Financial Challenges

- FDI flows shrinking (>11% in 2024).
- International project finance deals fell by 27%.
- Foreign portfolio investments remain **volatile**, sensitive to global shocks.

2. Gold Monetisation as a Policy Tool

- **Revitalised Gold Monetisation Scheme (GMS)** can mobilise household gold without coercion.
- Key pillars:
 - **Infrastructure:** Nationwide hallmarking and purity-testing centres.
 - **Logistics:** Secure gold collection and movement with bank-managed money flows.
 - **Digitalisation:** Depositors track gold like bank balances.
 - **Trust:** Simple, frictionless processes; minimal taxation or scrutiny.
- **Economic Benefits:** Cost of funds via gold (4.5–6.5%) cheaper than international borrowing, strengthens current account, and creates a vast pool for **infrastructure, manufacturing, and innovation**.

3. Broader Significance

- Mobilising domestic wealth is not only an economic move but a **civilisational choice**, reinforcing India's ability to **finance its own growth** and reduce dependency on global capital.

Conclusion

India's journey toward **financial self-reliance** through gold reflects a broader civilisational and economic imperative. By mobilising domestic wealth, building robust infrastructure for gold monetisation, and ensuring trust and digital transparency, India can reduce import dependence, strengthen domestic capital formation, and fund its own growth. Just as the country leveraged self-reliance to achieve food, digital, and vaccine security, **gold-driven financial Atmanirbharta** can underpin the next phase of India's economic transformation, ensuring growth on India's own terms.

