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Article

Nvidia doubles down on India with Hindi language model and major partnerships

Nvidia CEO Jensen Huang speaks during Computex 2024 in Taipei on June 4, 2024.

Nvidia on Thursday announced a slew of partnerships with major Indian firms and launched a Hindi language model, as the American chip company looks to ramp up business in one of the world's biggest technology markets.Nvidia CEO Jensen Huang spoke about the firm's tech and efforts in India at its AI Summit in Mumbai — an event that featured Bollywood superstar Akshay Kumar and India's richest person Mukesh Ambani, the chair of Reliance

Industries. Amid the flurry of partnerships announced on the occasion was a deal between Reliance and Nvidia to build AI infrastructure in India. Huang said that Nvidia is working with companies including Yotta and Tata Communications to also build computing infrastructure. Huang said that by the end of the year, India will have "20 times more compute" than just over a year ago, referring to the country's computing power."India used to be a country that produced software. [India] exported software. In the future, India is going to export AI," Huang said.

Nvidia also announced Nemotron-4-Mini-Hindi 4B — a small language model in Hindi, the widest-spoken of India's multitude of languages. Companies running Nvidia hardware can deploy this language model, while Indian IT consultancy Tech Mahindra is using Nvidia's model to launch its own Hindi AI model, Project Indus 2.0. Small language models are trained on much more compact and specific datasets compared to large language models, such as OpenAI's GPT-4. Nvidia is also collaborating with other major Indian IT companies like Infosys, Wipro and TCS to train around 500,000 developers in creating and implementing AI agents with its software.Nvidia's ramp-up in India takes place as the company looks to find new regions to boost business, while the breakneck speed growth it has experienced over the last year and a half begins to slow down. In India, Prime Minister Narendra Modi has been looking to lure in major foreign technology companies, particularly in the semiconductor industry, to increase investment in the country. India aims to establish itself as a major player in the semiconductor industry, as it strives for self-sufficiency in manufacturing.

Modi has outlined various objectives to advance the semiconductor sector, setting a significant target to grow the country's electronics industry from its current value of around $155 billion to $500 billion by 2030."India is very, very dear to the world's computer industry, central to the IT industry," Huang said. Ambani's presence at the Nvidia event also highlighted his conglomerate's ambition to become a leading AI player in India. Reliance Jio, the telecommunications firm under Ambani's Reliance Industries and an upstart less than a decade ago, is now India's biggest mobile provider. "Jio aims to build large scale AI infrastructure to democratize AI leveraging data emanating from almost a billion Internet users in next few years. With this planned investments and scale, Jio aims to be the flag bearer of proliferating AI adoption from consumers to enterprises to government," Neil Shah, partner at Counterpoint Research, told CNBC. This "unlocks significant opportunity" for Nvidia and other companies, Shah added.

Commentary:

This commentary describes **efficiency** within the context of new partnerships and investments by Nvidia in India. **Efficiency** implies the best utilization of available resources with a view to achieving the highest output from a given amount of inputs using minimal wastage; thus, an important economic concept in analyzing Nvidia's role in enhancing India's AI infrastructure. The CNBC article explains how Nvidia's efforts, like building a "Hindi language AI model and training 500,000 developers" aim to bridge the gap in skills and productivity across industries. In collaboration with big companies like Reliance Industries and Tata Communications, Nvidia is contributing to the development of computing infrastructure that will significantly boost India's capacity to integrate advanced AI technologies. This is expected not only to improve **efficiency** due to better use of labour and capital but also to ensure economic growth by creating human capital and spurring innovation. As India works towards its goal of becoming a hub for AI globally, Nvidia's investments have underlined the role of **efficiency** in making sure that technological progress translates into sustained economic progress. The theory of Aggregate Demand (AD) is key to analyzing the economic impact of Nvidia's investments. AD represents the total spending in an economy at various price levels and is calculated as $AD=C+I+G+(X-M)$, where I stands for investment. Real GDP is the economic output of a nation that is adjusted for inflation. It reflects the dollar value of all goods and services produced within an economy during a given time period and is an important indicator for economic growth and living standards.
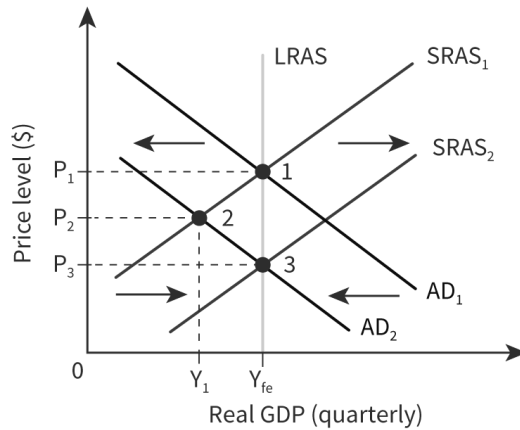
The first diagram depicts the recessionary gap for India prior to investment. The aggregate demand shifts left from AD1 to AD2, representing a decline in the total spending of an economy. Without the investments from Nvidia, India's economy has to face some critical challenges: sparse technological infrastructure, lack of skilled labor, and lowering consumer and business confidence. This leads to a decline in spending on the major components of AD: consumer expenditure (C), business investment (I), government spending (G), and possibly net exports (X - M). The decline in demand causes a shift of real GDP from Yfe down to Y1, reflecting lower output and underemployment of resources, including labor and capital. Accompanying the fall in real GDP, the price level also decreases from P1 to P2, reflecting deflationary pressures. This would be disastrous for the economic slowdown, given that a lower price could reduce profitability for firms further and dampen their motive to invest in the future. Thus, Nvidia's investment is crucial to restoring **efficiency** in India's market.

Figure 2: Short and Long Term Impacts of Nvidia's Investments on Aggregate Demand and Supply in India
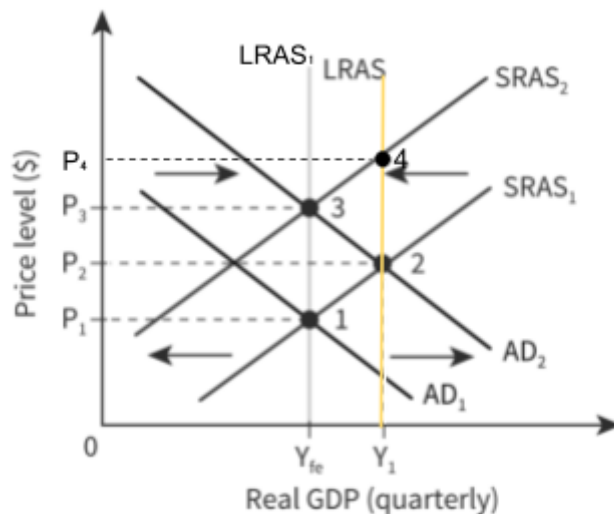

Figure 2 shows how an investment by Nvidia contributes towards the **inefficiencies** in India's economy: increasing the aggregate demand in the short term and expanding the productive capacity in the long run. This starts off with the economy, which is at point 1 and reflects the recessionary situation presented in Diagram 1. Nvidia's investments stimulate the aggregate demand and shift it to the right from AD1 to AD2, moving the economy along to point 2. This short-run shift raises real GDP to Y1 and pushes the price level up to P2, which tends to eliminate **inefficiencies** that result from underutilized resources, such as labor and capital. Nvidia's investments act as a catalyst for reversing this decline by improving both aggregate demand and productive capacity. From these, developing technological infrastructure and one related to skill shortages, the economy's LRAS is shifted rightward from LRAS to LRAS1. This increased productive capacity of the shift shows full employment output, which is shifted at Yfe that corresponds to point 3.

The **efficiency** of resource allocation that Nvidia's investments bring about significantly improves both in the short and long run. In the short run, such investments increase aggregate demand, thereby increasing output, improving the level of employment, and putting underutilized resources like labor and capital to work. This may also lead to some inflationary pressures as the increasing demand pushes up prices, especially if supply does not keep pace. In the long run, focusing on technological infrastructure and human resource development by Nvidia will help get rid of structural **inefficiencies**, spur innovation, eliminate production bottlenecks, and lay the foundation for long-term economic growth.

While Nvidia's investments may finally position India as an emerging global hub for AI, success will require supportive governmental policies, such as equitably investing in education and infrastructure, so that the benefits become more inclusive and widespread. Moreover, there is a need to balance the immediate gains with long-term **efficiency** by addressing challenges such as inflation and economic dependency on foreign firms. If well managed, the contributions by Nvidia will help drive the economic transformation of India, a combination of immediate recovery and long-term improvements in productivity and competitiveness.