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'Fabless model suits India's ready-made talent pool'

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FORMER AMD founder and CEO Jerry Saunders once notoriously quipped, "Real men have fabs." But times have changed and the semiconductor industry continues to reinvent itself. As new semiconductor fabs are built in China and various other geographic locations, the government of India recently announced a semiconductor policy along with incentives to encourage companies to build a semiconductor fabrication (fab) facility.

On the surface, building a fab in India seems to make perfect sense. Dig a bit deeper and the reasons for a fab become less clear. While private consortiums pushing the fab proposal believe that this is a splendid idea to build the Indian economy, I'm yet to see a clear direction, value and I question the rationale. Since the Indian government's semiconductor policy announcement, multiple proposals from various consortiums have been floated to build several fabs throughout India.

Let's start with an overview of the semiconductor industry, which is experiencing untoward change. If India and the consortiums were to move forward with this audacious plan, they would soon find that the semiconductor market is cyclical and tends toward a "boom or bust" economy driven by pricing pressure and leading-edge process technologies. As you can imagine, that makes it a difficult business proposition to manage.

Having a fab does not mean cost effectiveness or competitiveness or even better, cheaper chips for local consumption. In fact, building a fab is a huge capital investment. Latest estimates put the cost at \$3 billion or more and will continue to go up with each new technology process. And, it's much more than start-up costs, as a fab needs regular maintenance, not to mention the cost of tracking new process technologies and constant retooling.

While it could create 5,000 -10,000 or so jobs, we need to consider the \$3 billion investment for a single fab and compare it to the return it will provide. The market leader in the foundry business is Taiwan Semiconductor Manufacturing Company (TSMC). It has built its business on long-term technology and business partnerships with key captive customers. Intel's announcement that it intends to build a fab in China reinforces the point that a captive fab could drive development and provide a ready-made customer base. Captive fabs such as Intel's can bring the much-needed semiconductor ecosystem and help develop the infrastructure. But is this enough to justify building a fab in India?

Another point is that the formerly popular integrated device manufacturer (IDM) model that swept the semiconductor industry in the 1990s is gone because it's not cost-effective, efficient and, most importantly, not practical. Add to this the widespread consolidation and the unmistakable conclusion is that India may have missed the fab trend.

It's well known that India's talent base is steeped in software development. Our designers are not process or manufacturing experts. That means that India would need to create university-level training programmes and the whole ecosystem and infrastructure, including bringing expert talent from other countries to get a fab operational and working efficiently. With fabs come environment hazards, including import and manufacturing of gases and other hazardous chemicals, and need for proper disposal of those chemicals.

As compared to the fab business, the software and very large scale integration (VLSI) design engineering industry is clean and can be distributed over various geographic locations, and doesn't need a huge infrastructure. The only requirement is access to engineering talent and internet connectivity. Conversely, the fab is one production facility in one location.

The questions government officials should be asking is whether government policy should be focused on offering incentives to build a fab or if it should focus on incentivising the VLSI design industry that can offer much more value and return for its investment.

Given all this, wouldn't a better use of government incentives and the consortium's billion dollar funds be to invest \$3 million each in 1,000 design companies to further promote the fabless model in India? The incentives could provide access to design tools and intellectual property (IP), along with subsidised or free silicon manufacturing for engineering prototyping to these fabless design companies. This would allow local companies to develop new chip designs for the local market. It would enable local systems and consumer companies to develop products using these new chips and create more value in their products. Because of these subsidies, it will become easier for entrepreneurial engineering to get into the chip business.

Additionally, it would be far more cost-effective and 1,000 companies could mean employment for close to 2,00,000 or more. Just think of it: Of the 1,000 companies, about 100 will succeed and could become leading worldwide fabless companies, rivalling today's market leaders and creating tremendous return on investment.

The market cap of TSMC is about \$56 billion. Compare that to the market cap of Qualcomm, the number one fabless semiconductor company, which is \$75 billion. The market cap of the top 10 fabless semiconductor companies combined is in excess of \$150 billion. According to the Fabless Semiconductor Association, revenue for public fabless companies was \$49.5 billion in 2006, accounting for 20% of the total semiconductor revenue. The numbers speak for themselves. The unmistakable conclusion is that the real value is in owning the design and not owning the fab.

We have a large ready-made pool of creative, talented engineers who generate products for local and international companies. Traditionally, the Indian software and chip design companies have focused on service, not on developing products. India should continue to invest in this talent and offer incentives to build products instead of only providing services. Perhaps it is time we learned to design, build and market products, though without incentives, it will not happen.

India is fast becoming a global economic force due to its strong design talent. With the days of 'real men have fabs' over, building a fab is too difficult, the investment is too high and return questionable. A far wiser choice would be for India to remain fabless and focus on its core competency. Let's look elsewhere for ways to create value and become a true economic powerhouse.

(The writer is president and CEO of QualCore Logic, a provider of digital, mixed-signal and analog IP and chip design services. The views expressed are personal.)

