Technology, Industrialization and Economic Development in Emerging Economies

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The birth of industrial revolution that occurred in Britain was the transition to new manufacturing processes in the period from about 1760 to 1840. The transition included the migration of the era of the use hand to the use machines, new chemical manufacturing and iron production processes, the increasing use of steam power, the development of machine tools and the rise of factory system with the textile industry being the first to use modern production methods [wiki]. Following the revolution, by the mid-18th century, Britain controlled a global trading empire with colonies in North America and political influence over the Indian subcontinent by the East India.

Emerging Markets

Popularly called developing countries, emerging markets are countries with either low or lower middle per capita income of less than $4,035 based on World Banks definition of developing countries. According to the balance, they are characterized by having **a lower-than average per capita income** of less than $4,035, **rapid growth**, **high volatility** resulting from natural disasters, external price shocks and domestic policy instability, higher susceptibility to volatile currency swings such as changes in dollar rate and prices of commodities such as oil or food. Other characteristics include **less mature capital markets** and **higher than average return for investors**

Two popular groupings under the developing economies are BRICS (Brazil, Russia, India, China and South Africa) and MINT (Mexico, Indonesia, Nigeria and Turkey) economies.

Industrialisation: Economic Growth Driver and a Source of Global Competitive Advantage

Industrialization is the utilization of machineries and equipment for manufacturing or the production of goods or commodities in large scales in a country or region and what comes to mind it is mentioned, is the manufacturing of products. According to UNIDO's Industrial Development Report 2013, since the industrial revolution, manufacturing has been the core of structural change, consistently creating higher levels of output and employment and leading to growth in incomes. For developing countries with a goal to maintaining growth while sustaining job creation, manufacturing offers an opportunity not only to rebalance the economy towards higher value -added sectors but also to provide a wide employment base with higher labour productivity.

Manufacturing which is the core of industrialisation has remained a major contributor to the prosperity of nations but its contribution to the GDP and impact on employment varies depending on the state of the economy (developed or developing) and time. Its contribution to GDP and how it becomes a source of employment grows as an economy embarrasses industrialisation and takes a downward toll the economy moves to or gains the status of a developed economy. The curve is like that of a lightly-stretched inverted U. For developed and most developing (emerging) economies, the contribution of industrialisation (manufacturing) to GDP is already taking that deep.

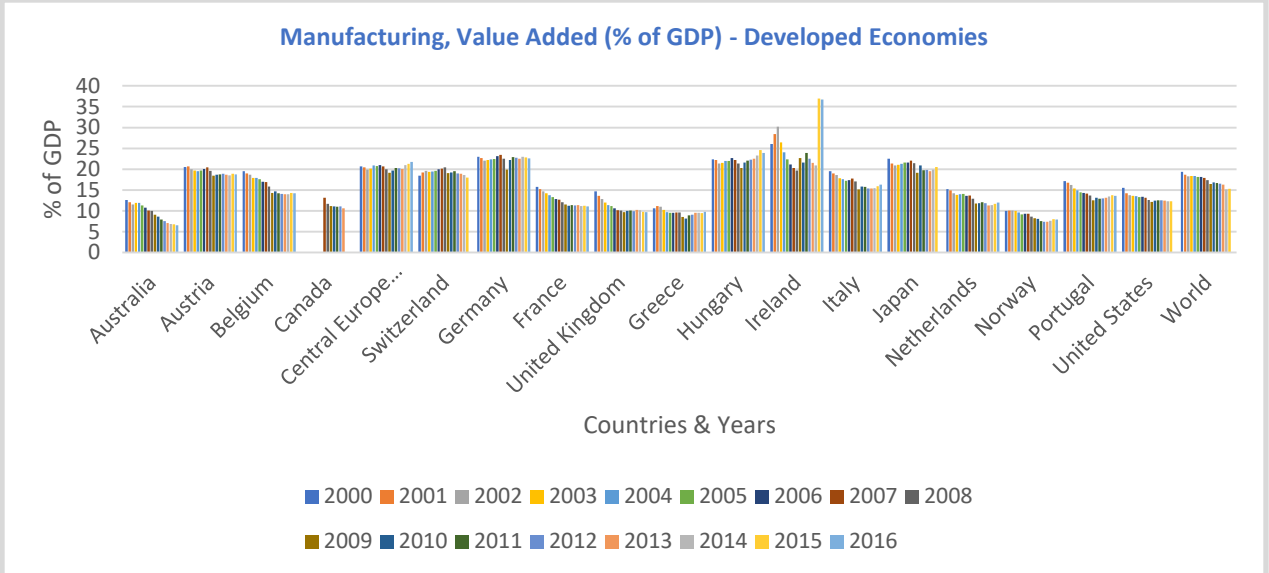

Fig 1: % Contribution of Manufacturing to GDP – Developed Economies

[*Data source: World Bank National account data and OECD National accounts data file*]

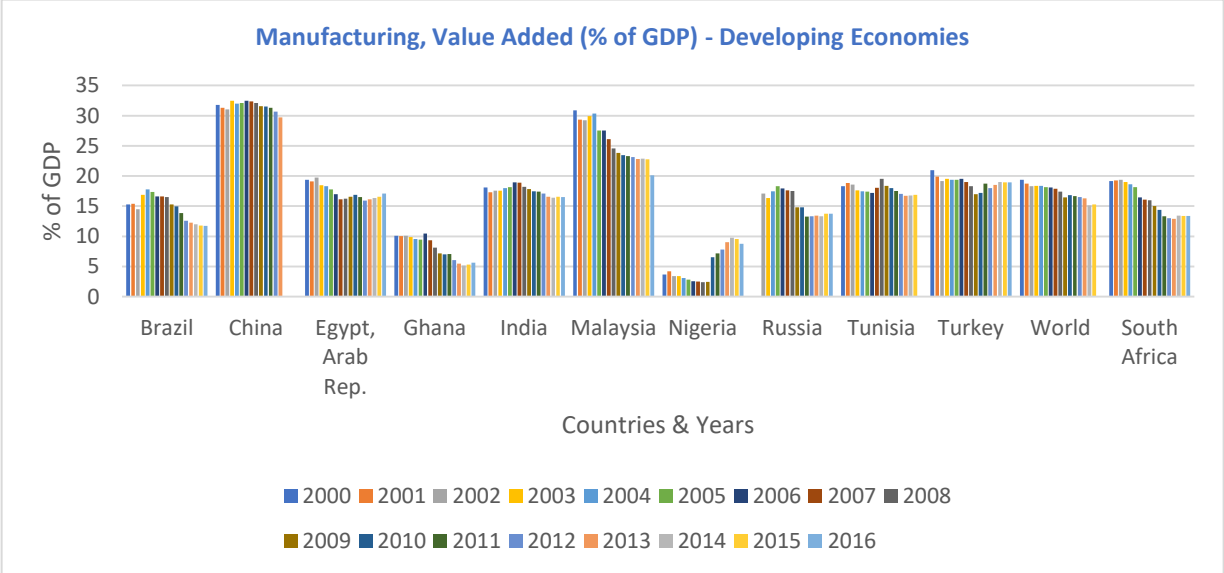

Fig 2: % Contribution of Manufacturing to GDP – Developing Economies

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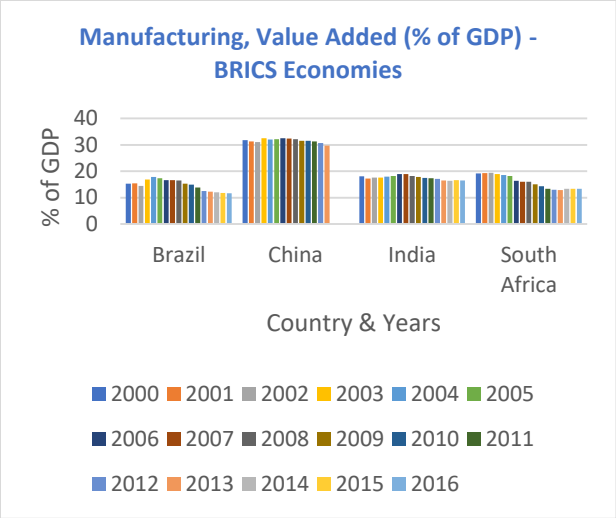

Fig 3: % Contribution of Manufacturing to GDP – BRICS

[*Data source: World Bank National account data and OECD*

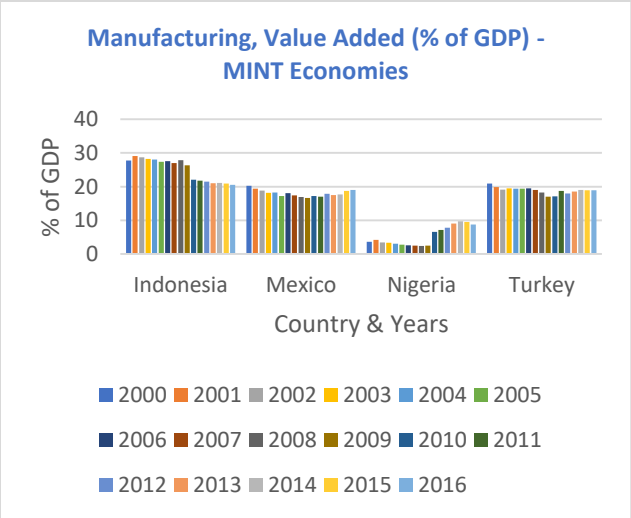

Fig 4: % Contribution of Manufacturing to GDP – MINT

[*Data source: World Bank National account data and OECD*

Figures 1 to 4 show that there is a trend of decline in the of contribution of manufacturing to GDP for both developed and developing economies (BRICS, MINT and others). Globally, there is a drop from 19.4% contribution in year 2000 to 15.3% in 2015 as shown in figure 8 based on World Bank and OECD National data and this trend can be linked to the fast growth of the technology industry and the move of global economies towards a more service-based economy.

The relevance of industrialisation as a source of income for a nation and competitive advantage in the global stage cannot be overemphasized. As a major source of foreign earnings, it also helps raise standard of living through job creation which impacts people's ability to purchase goods and services and also invest in health and education. From enterprise point of view, there is an accumulation of wealth which enterprises can reinvest into more technology and innovations thus directing them to new business opportunities that can channel resources whilst sustaining their current business operations. The net effect of this are higher cash flow in volumes and velocity, reduction in poverty resulting from increased level of employment, continuous increase in technological development and higher gross domestic product.

China sets a big example for other developing countries to follow aside Malaysia which is relatively playing strong in recent years as shown in Figure 2. Regardless of its relatively low GDP per capita of 8,123.18 USD in 2016 influenced by its population size compared to GPD capita of 57,466.79 USD, 42,157.93 USD, 36,854.97 USD, 39,899.39 USD for USA, Canada, Germany and United Kingdom respectively, there is a chance for the nation to rise to the position of a leader in the new world order. This is certainly not farfetched from its active involvement which in manufacturing, having contributed 39% to the world growth in 2016.

Interestingly, as the contribution of the manufacturing gradually tips over across economies globally, the service sector is experiencing a climb. This does not weaken the

relevance of manufacturing or industrialisation to economic growth but shows the impact of the rapid transformations in technology and management that is occurring with It is critical for developing economies to note that the boom of the industrial sector of their economy leads to a boom in the manufacturing-related services such as R&D, design, engineering, branding, marketing and sales.

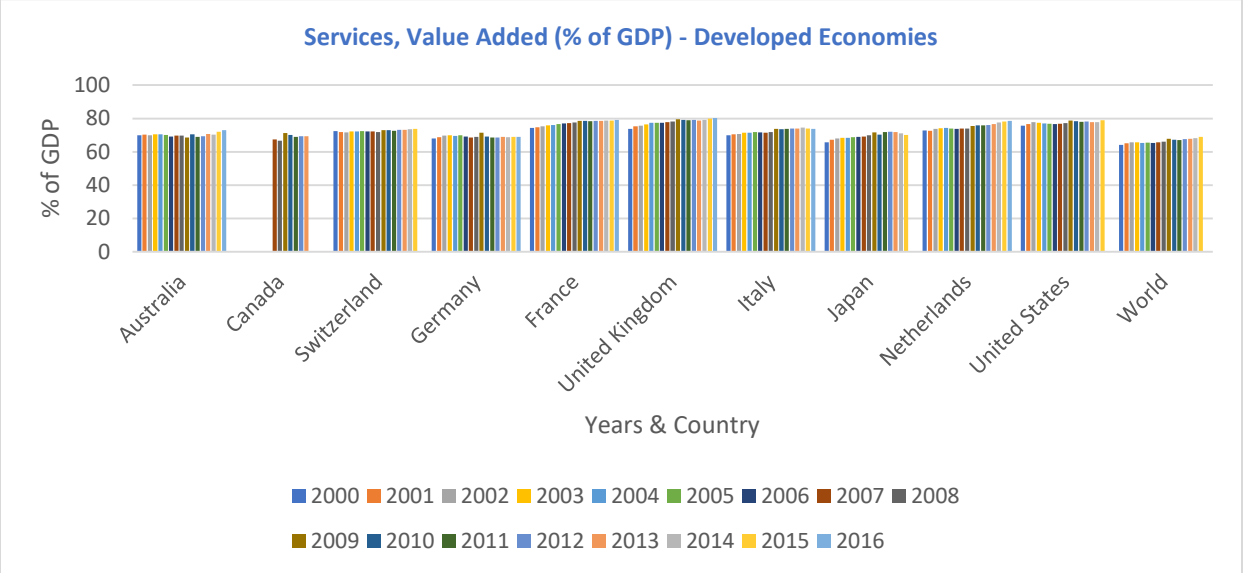

Fig 5: % Contribution of Services Sector to GDP – Developed Economies

[*Data source: World Bank National account data and OECD National accounts data file*]

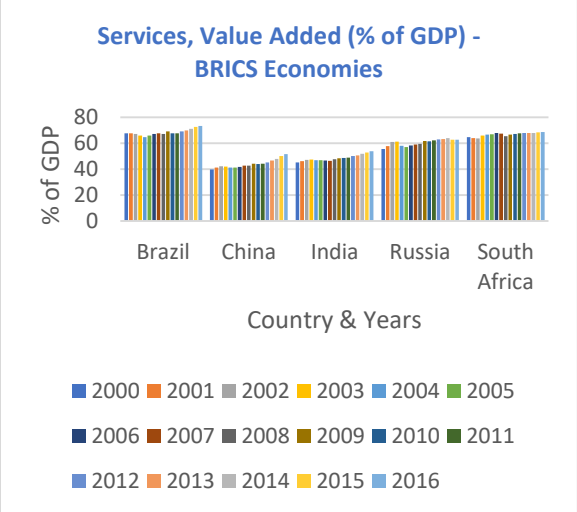

Fig 6: % Contribution of Services Sector to GDP – BRICS

[*Data source: World Bank National account data and OECD*

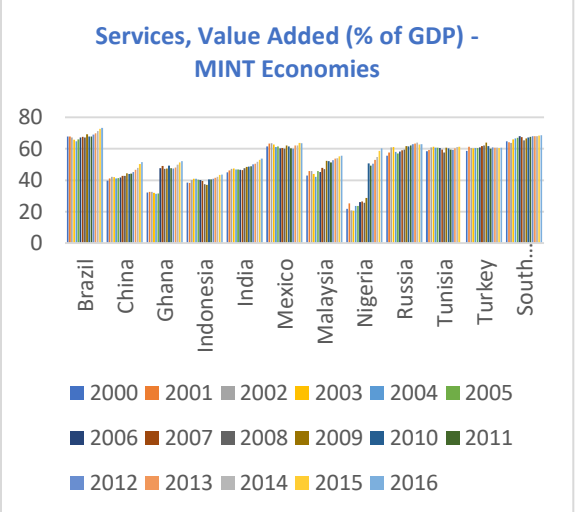

Fig 7: % Contribution of Services Sector to GDP – MINT

[*Data source: World Bank National account data and OECD*

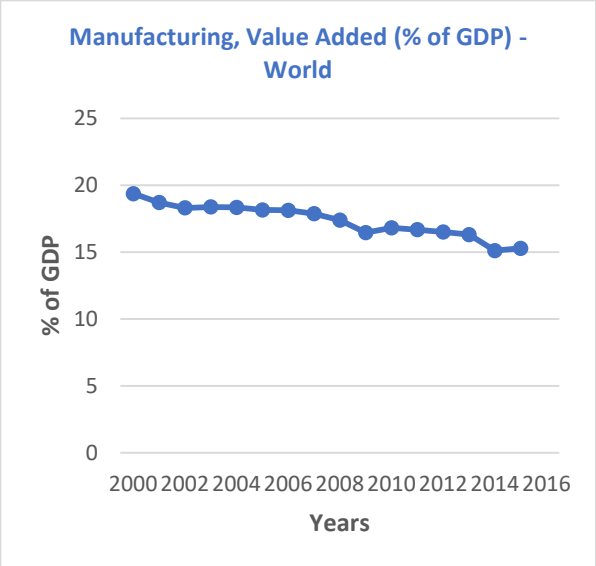

Fig 8: % Contribution of Manufacturing Sector to World's GDP (2000 – 2016)

[*Data source: World Bank and OECD National accounts data file*]

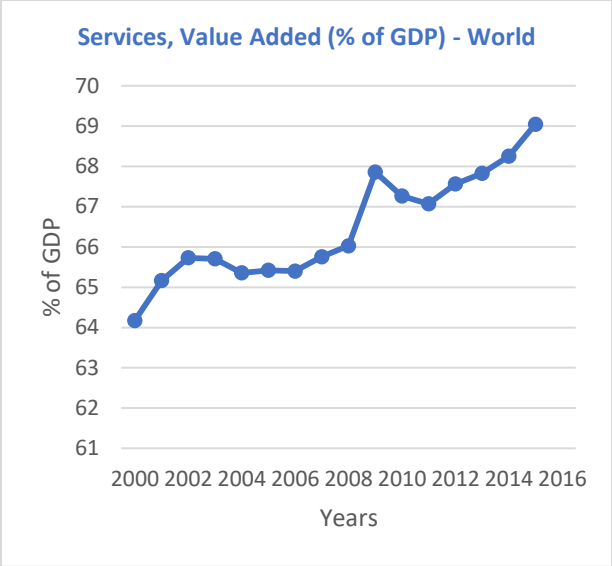

Fig 9: % Contribution of Services Sector to World's GDP (2000 – 2016)

[*Data source: World Bank and OECD National accounts data file*]

Industrialisation on the Wheels of Technology

For so many people, the fact that technology is a fuel for industrialization and industrialization, a driver to economic development is a broken record. It is a song that has been sung by pioneer industrialists such as Samuel Slater (1768 – 1835), Moses brown (1738 – 1836), Jamsetji Tata (1839 – 1904) and in recent years, by advocates of industrialisation and organisations such as Global Manufacturing & Industrialisation Summit (GMIS), United Nations Industrialisation Development Organisation (UNIDO) etc. but sadly, the countries that should embrace it and take advantage of the numerous benefits it presents are not doing all that needs to be done within their capacity.

The industrial revolution that brought about the economic development of Britain from 1760 to 1840 was technologically driven which saw the advent of the use of new energy sources and the invention of new organization of work known as factory systems that led to better utilisation of natural and machineries resources for mass production. We are witnessing an industrial revolution of the 21st century that is powered by a digital-based technology as against the machine-based technology of the 18th century and the preceding industrial revolutions.

Using Nigeria as an example for emerging economies, the Ministry of Budget and National Planning has set an economic growth target of 7 per cent by 2020 starting with a 3.5 percent growth in 2018 and 4.5 per cent in 2019 according Guardian Nigeria dailies. Like any economic or financial model, there are key drivers that must be at optimum performance for the model or projection to be actualized and for an economic growth plan, industrialization is a sine qua non with technology as the driver.

Classification of Manufacturing Industries by Technology	
International Standard Industrial Classification	Technology Group
Food and beverages	Low tech
Tobacco products	Low tech
Textiles	Low tech
Wearing apparel, fur, leather products and footwear	Low tech
Wood products (excluding furniture)	Low tech
Paper and paper products	Low tech
Printing and publishing	Low tech
Furniture; manufacture, not elsewhere classified	Low tech
Coke, refined petroleum products and nuclear fuel	Medium tech
Rubber and plastic products	Medium tech
Non-mettallic mineral products	Medium tech
Basic metals	Medium tech
Fabricated metal products	Medium tech
Chemicals and chemical products	High tech
Machinery and equipment, not elsewhere calssified; office, accounting and computing machinery	High tech
Electrical machinery and apparatus; radio, televesion and communication equipment	High tech
Medical, precision and optical instruments	High tech
Motor vehicles, trailers, semi-trailers and other transport eqipment	High tech

Table 1: Classification of Manufacturing Industries by Technology

[*Data source: UNIDO Industrial Development Report 2013*]

The manufacturing sector can be classified by technology level in line with UNIDO Industrial Report 2013. Taking a look at the figure, emerging economies can tick off from the list to measure how industrialised their economies are by probing to know how many of these industries they actively play in and how many they have the capacity of resources to play in if not currently participating in those industries. automated systems and artificial intelligence in different points of manufacturing value chain.

The grouping further buttresses the fact that technology is a key driver of the industry and to be able to harness the rich gains that comes from playing in the sector, emerging markets especially Africa must invest more in technology and be ready to integrate it along the industries value chain from R&D to designs, operations, management as well as in sales and marketing.

Wherever space a nation decides to play in, it is important to keep in mind that, manufacturing technology is significantly evolving from basic automated systems to more integration of advanced technologies.

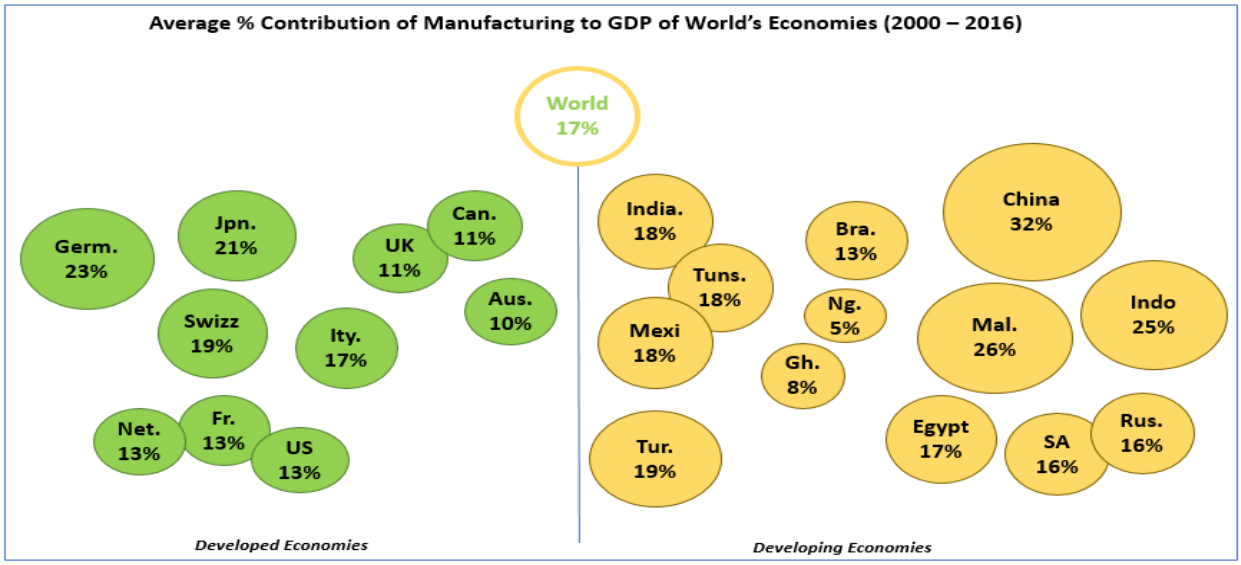

Fig 10: Average % Contribution of Manufacturing to GDP of World Economies (2000 -2016)

In conclusion, despite the global decline in the percentage contribution of manufacturing to GDP globally, its contribution is still very much significant to economic growth and sustenance. Figure 10 shows that regardless of a well-diversified economy of the developed nations and their shift towards economies that is powered by technology, innovations and new management systems, manufacturing still contributes significantly to their economies. Most countries in Africa, aside South Africa and Egypt from available data who are performing like the rest of the world in the manufacturing space, have a long way to drive. There is a huge gap to cover which invariably presents a huge market for both local and international investors.

A major way to bridge the gap is for governments to implement policies and put in place structures that support local manufacturing and encourages foreign investors whilst investing in technology in the mid-term and education in the long range. For any economy to be really industrialised and achieve sustainable economic growth, the educational system must be in integrated into the road map of its sustainable growth plan. Education is a long-term approach of which if it is well-designed and implemented from kindergarten to tertiary level, the positive rewards are generational.

Ref.

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