Executive Yuan’s call to action:“Industrial Upgrading and Transformation Action Plan”

I.Introduction

Having sustained the negative repercussions following the global financial crisis of 2008, Taiwan’s average economic growth rate decreased from 4.4 percent (during 2000-2007 years) to 3 percent (2008-2012). This phenomenon highlighted the intrinsic problems the Taiwanese economic growth paradigm was facing, seen from the perspective of its development momentum and industrial framework: sluggish growth of the manufacturing industries and the weakening productivity of the service sector. Moreover, the bleak investment climate of the post-2008 era discouraged domestic investors injecting capital into the local economy, rendering a prolonged negative investment growth rate. To further exacerbation, the European Debt Crisis of 2011 – 2012 has impacted to such detriment of private investors and enterprises, that confidence and willingness to invest in the private sector were utterly disfavored.

It can be observed that as Taiwan’s industrial core strength is largely concentrated within the the manufacturing sector, the service sector, on the other hand, dwindles. Similarly, the country’s manufacturing efforts have been largely centered upon the Information & Communications Technology (ICT) industry, where the norm of production has been the fulfillment of international orders in components manufacturing and Original Equipment Manufacturing (OEM). Additionally, the raising-up of society’s ecological awareness has further halted the development of the upstream petrochemical and metal industry. Consumer goods manufacturing growth impetus too has been stagnated.

Against the backdrop of the aforementioned factors at play as well as the competitive pressure exerted on Taiwan by force of the rapid global and regional economic integration developments, plans to upgrade and transform the existing industrial framework, consequently, arises out as an necessary course of action by the state. Accordingly, Taiwan’s Executive Yuan approved and launched the “Industrial Upgrading and Transformation Action Plan”, on the 13th of October 2014, aiming to reform traditional industries, reinforcing core manufacturing capacities and fostering innovative enterprises, through the implementation of four principal strategies: Upgrading of Product Grade and Value, Establishment of Complete Supply Chain, Setting-up of System Integration Solutions Capability, Acceleration of Growth in the Innovative Sector.

II.Current challenges confronting Taiwanese industries

1.Effective apportionment of industrial development funds

Despite that Research and Development (R&D) funds takes up 3.02% of Taiwan’s national GDP, there has been a decrease of the country’s investment in industrial and technology research. Currently Taiwan’s research efforts have been directed mostly into manufacturing process improvement, as well as into the high-tech sector, however, traditional and service industries on the other hand are lacking in investments.

If research funds for the last decade could be more efficiently distributed, enterprises would be equally encouraged to likewise invest in innovation research. However, it should be noted that Taiwan’s Small and Medium Enterprises (SME) based on their traditional developmental models, do not place research as their top priority. Unlike practices in countries such as Germany and Korea, the research fund input by private enterprises into academic and research institutions is still a relatively unfamiliar exercise in Taiwan.

With regards to investment focus, the over-concentration in ICTs should be redirected to accommodate growth possibilities for other industries as well. It has been observed that research investments in the pharmaceutical and electric equipment manufacturing sector has increased, yet in order to not fall into the race-to-the-bottom trap for lowest of costs, enterprises should be continually encouraged to develop high-quality and innovative products and services that would stand out.

2.Human talent and labor force issues

Taiwan’s labor force, age 15 to 64, will have reached its peak in 2015, after which will slowly decline. It has been estimated that in 2011 the working population would amount to a meager 55.8%. If by mathematical deduction, based on an annual growth rate of 3%, 4% and 5%, in the

year 2020 the labor scarcity would increase from 379,000, 580,000 to 780,000 accordingly. Therefore, it is crucial that productivity must increase, otherwise labor shortage of the future will inevitably stagnate economic growth.

Notwithstanding that Taiwan's demographical changes have lead to a decrease in labor force; the unfavorable working conditions so far has induced skilled professionals to seek employment abroad. The aging society along with decrease in birth rates has further exacerbated the existing cul-de-sac in securing a robust workforce. In 1995 the employment rate under the age of 34 was 46.35%, yet in 2010 it dropped to a daunting 37.6%.

3.Proportional land-use and environmental concerns

Taiwan's Environmental Impact Assessment (EIA) is a time-consuming and often unpredictable process that has substantially deterred investor's confidence. Additionally, there exists a disproportionate use of land resources in Taiwan, given that demand for its use predominantly stems from the northern and middle region of the country. Should the government choose to balance out the utilization of land resources across Taiwan through labor and tax policies, the situation may be corrected accordingly.

III.Industrial Upgrading and Transformation Strategies

The current action plan commences its implementation from October 2014 to end of December 2024. The expected industrial development outcomes are as follows: (1) Total output value of the manufacturing sector starting from 2013 at NTD 13.93 trillion is expected to grow in 2020 to NTD 19.46 trillion. (2) Total GDP of the service sector, starting at 3.03 trillion from 2011 is expected to grow in 2020 to 4.75 trillion NTD.

1.Strategy No.1 : Upgrading of product grade and value

Given that Taiwan's manufacturing industry's rate for added value has been declining year after year, the industry should strive to evolve itself to be more qualitative and value-added oriented, starting from the development of high-end products, including accordingly high-value research efforts in harnessing essential technologies, in the metallic materials, screws and nuts manufacturing sector, aviation, petrochemical, textile and food industries etc.

(1) Furtherance of quality research

Through the employment of Technology Development Program (TDP) Organizations, Industrial TDP and Academic TDP, theme-based and pro-active Research and Development programs, along with other related secondary assistance measures, the industrial research capability will be expanded. The key is in targeting research in high-end products so that critical technology can be reaped as a result.

(2) Facilitating the formation of research alliances with upper-, mid- and downstream enterprises

Through the formation of research and development alliances, the localization of material and equipment supply is secured; hence resulting in national autonomy in production capacity. Furthermore, supply chain between industrial component makers and end-product manufacturers are to be conjoined and maintained. National enterprises too are to be pushed forth towards industrial research development, materializing the technical evolution of mid- and downstream industries.

(3) Integrative development assistance in Testing and Certification

The government will support integrative development in testing and certification, in an effort to boost national competitive advantage thorough benefitting from industrial clusters as well as strengthening value-added logistics services, including collaboration in related value-added services.

(4) Establishment of international logistics centre

Projection of high-value product and industrial cluster image, through the establishment of an international logistics centre.

2.Strategy No.2 : Establishment of a Complete Supply Chain

The establishing a robust and comprehensive supply chain is has at its aim transforming national production capabilities to be sovereign and self-sustaining, without having to resort to intervention of foreign corporations. This is attained through the securing of key materials, components and equipments manufacturing capabilities. This strategy finds its application in the field of machine tool controllers, flat panel display materials, semiconductor devices (3D1C), high-end applications processor AP, solar cell materials, special alloys for the aviation industry, panel equipment, electric vehicle motors, power batteries, bicycle electronic speed controller (ESC), electrical silicon steel, robotics, etc. The main measures listed are as follows:

(1) Review of industry gaps

After comprehensive review of existing technology gaps depicted by industry, research and academic institutions, government, strategies are to be devised, so that foreign technology can be introduced, such as by way of cooperative ventures, in order to promote domestic autonomous development models.

(2) Coordination of Research and Development unions – building-up of autonomous supply chain. Integrating mid- and downstream research and development unions in order to set up a uniform standard in equipment, components and materials in its functional specifications.

(3) Application-theme-based research programs

Through the release of public notice, industries are invited to submit research proposals focusing on specific areas, so that businesses are aided in developing their own research capabilities in core technologies and products.

(4) Promotion of cross-industry cooperation to expand fields of mutual application

Continuously expanding field of technical application and facilitating cross-industry cooperation; Taking advantage of international platform to induce cross-border technical collaboration.

3.Strategy No.3 : Setting-up of System Integration Solutions capability

Expanding turnkey-factory and turnkey-project system integration capabilities, in order to increase and stimulate export growth; Combination of smart automation systems to strengthen hardware and software integration, hence, boosting system integration solution capacity, allowing stand-alone machinery to evolve into a total solution plant, thus creating additional fields of application and services, effectively expanding the value-chain. These type of transitions are to be seen in the following areas: turnkey-factory and turnkey-project exports, intelligent automated

manufacturing, cloud industry, lifestyle (key example: U-Bike in Taipei City) industry, solar factory, wood-working machinery, machine tools, food/paper mills, rubber and plastic machines sector. Specific implementation measure s includes:

(1) Listing of national export capability – using domestic market as test bed for future global business opportunities

Overall listing of all national system integration capabilities and gaps and further assistance in building domestic “test beds” for system integration projects, so that in the future system-integration solutions can be exported abroad, especially to the emerging economies (including ASEAN, Mainland China) where business opportunities should be fully explored. The current action plan should simultaneously assist these national enterprises in their marketing efforts.

(2) Formation of System Integration business alliances and Strengthening of export capability through creation of flagship team Formation of system integration business alliances, through the use of national equipment and technology, with an aim to comply with global market’s needs. Promotion of export of turnkey-factory and turnkey-projects, in order to make an entrance to the global high-value system integration market. Bolstering of international exchanges, allowing European and Asian banking experts assist Taiwanese enterprises in enhancing bids efforts.

(3) Establishing of financial assistance schemes to help national enterprises in their overseas bidding efforts

Cooperation with financial institutes creating financial support schemes in syndicated loans for overseas bidding, in order to assist national businesses in exporting their turnkey-factories and turnkey-solutions abroad.

4. Strategy No.4 : Acceleration of growth in the innovative sectors

Given Taiwan economy’s over-dependence on the growth of the electronics industry, a new mainstream industry replacement should be developed. Moreover, the blur distinction between the manufacturing, service and other industries, presses Taiwan to develop cross-fields of application markets, so that the market opportunities of the future can be fully explored. Examples of these markets include: Smart Campus, Intelligent Transportation System, Smart Health, Smart City, B4G/5G Communications, Strategic Service Industries, Next-Generation Semiconductors, Next-Generation Visual Display, 3D Printing, New Drugs and Medical Instruments, Smart Entertainment, Lifestyle industry (for instance the combination of plan factory and leisure tourism), offshore wind power plant, digital content (including digital learning), deep sea water. Concrete measures include:

(1) Promotion of cooperation between enterprises and research institutions to increase efficiency in the functioning of the national innovation process

Fostering of Industry-academic cooperation, combining pioneering academic research results with efficient production capability; Cultivation of key technology, accumulation of core intellectual property, strengthening integration of industrial technology and its market application, as well as, establishment of circulation integration platform and operational model for intellectual property.

(2) Creating the ideal Ecosystem for innovation industries

Strategic planning of demo site, constructing an ideal habitat for the flourishing of innovation industries, as well as the inland solution capability. Promotion of international-level testing environment, helping domestic industries to be integrated with overseas markets and urging the development of new business models through open competition. Encouraging international cooperation efforts, connecting domestic technological innovation capacities with industries abroad.

(3) Integration of Cross-Branch Advisory Resources and Deregulation to further support Industrial Development

Cross-administrations consultations further deregulation to support an ideal industrial development environment and overcoming traditional cross-branch developmental limitations in an effort to develop innovation industries.

IV. Conclusion

Taiwan is currently at a pivotal stage in upgrading its industry, the role of the government will be clearly evidenced by its efforts in promoting cross-branch/cross-fields cooperation, establishing a industrial-academic cooperation platform. Simultaneously, the implementation of land, human resources, fiscal, financial and environmental policies will be adopted to further improve the investment ambient, so that Taiwan’s businesses, research institutions and the government could all come together, endeavoring to help Taiwan breakthrough its currently economic impasse through a thorough industrial upgrading.

Moreover, it can be argued that the real essence of the present action plan lies in the urge to transform Taiwan’s traditional industries into incubation centers for innovative products and services. With the rapid evolution of ICTs, accelerating development and popular use of Big Data and the Internet of Things, traditional industries can no longer afford to overlook its relation with these technologies and the emerging industries that are backed by them. It is only through the close and intimate interconnection between these two industries that Taiwan’s economy would eventually get the opportunity to discard its outdated growth model based on “quantity” and “cost”. It is believed that the aforementioned interaction is an imperative that would allow Taiwanese industries to redefine its own value amidst fierce global market competition. The principal efforts by the Taiwanese government are in nurturing such a dialogue to occur with the necessary platform, as well as financial and human resources. An illustration of the aforementioned vision can be seen from the “Industrie 4.0” project lead by Germany – the development of intelligent manufacturing, through close government, business and academic cooperation, combining the internet of things development, creating promising business opportunities of the Smart Manufacturing and Services market. This is the direction that Taiwan should be leading itself too.

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