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TITLE OF PAPER: **Evolving Role of DPSUs in sustained economic growth of the country**

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Abstract

India is among the fastest growing economies in the world with the IMF World Economic Outlook 2017 projecting that growth of the Indian economy will be 7.2% for year 2017 and 7.7% for 2018. While the growth is propelled largely by services sector, there is a need to propel manufacturing driven growth for sustainability and employment generation. Competitive advantage and financial benefits can accrue when manufacturing growth is driven by indigenous design and technological capabilities.

The Public Sector Enterprises, in general and defence PSEs in particular, have been cornerstones of infrastructural development, self reliance and propellers of economy during early nation building and consolidation phase of nation's economic history. The genesis of public sector is the vision of achieving self reliance in core infrastructural and defence sectors to obtain economic growth and leverage in International polity.

With the changing economic scenario, the role of DPSUs has undergone a radical shift. Along with harbingers of technology infusion into the country, DPSUs like HAL and BEL also play a role in developing the manufacturing ecosystem in advanced technologies. Sudden changes in technological environment, globalisation and increased frequency of black swan events [9] have increased uncertainty in business environment. This paper explores the changing roles and strategies adopted by Hindustan Aeronautics Limited (HAL) and Bharat Electronics Limited (BEL), leading DPSUs, in acting as catalysts of technology growth and 'creating a sustainable supply chain' powered by a Project management approach for thriving in this ever changing economic ecosystem and contributing to country's economic growth.

Intent

The paper elaborates on the challenges posed by the changing world, ways to ensure robustness of economic growth, institutionalized approach to growth through project management and some of the measures taken by the earliest PSUs to be set up - Hindustan Aeronautics Limited (HAL) and Bharat

Electronics Limited (BEL) to lead the change and adapt themselves to the changing expectations of the country from the public sector. Strategies to counter economic unpredictability (VUCA), exploring new avenues for collaboration and business diversification as the defining means of DPSUs to alter the economic landscape of the country have been dwelled upon.

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I Introduction

Among the major drivers behind the Indian success story propelling growth as well as self-reliance, spearheading technology development as well as meeting strategic requirements, is the crucial role of Public sector enterprises (PSEs). PSEs in India laid the foundation of rapid industrialization of the country and higher economic growth during the early years of planning that encompassed the socio-economic

mandate of the country building the economic and industrial ecosystem with inclusive growth. Public sector undertakings are in the field of heavy industry like steel, coal, oil, heavy machinery and aerospace.

However, the last decade has seen a drastic change in what was a stable and growing economic and business environment across the globe in general and the Indian core Industry segment (where the Public sectors are operating) in particular. Sudden changes in the technological environment, globalisation of the economy and increased frequency of black swan events [9] has increased the volatility and uncertainty in the environment leading to a 'VUCA' world – the one that is Volatile, Uncertain, Complex and Ambiguous. Ability to be responsive to the changes with agility coupled with a consolidation of capabilities to influence the environment is the key requirement to sustain in the industry. [7] In this journey, the way the PSUs have restructured to redefine their roles with respect to their contribution to the economy has been explored.

II Methodology

An experiential analysis has been carried out on the some of the measures taken by HAL and BEL and the insights from their transformative approach have been discussed.

The methodology of the experiential analysis carried out includes:

(i) Analysis of the Indian economy and the historical role of CPSEs in its growth

(ii) Journey of DPSUs - HAL and BEL and their successful collaborations

(iii) Evolving roles of PSEs - Business scenario analysis in a VUCA world

(iv) PSEs as harbingers of technology

(v) PSEs as propellants of Indigenous supply chain ecosystem

(vi) Project Management Approach to driving growth

(vii) New age role of PSEs - Engines of growth of Indian economy

III Analysis of the Indian economy and the historical role of CPSEs in its growth

The Indian economy today is the fastest growing in the world. But the scenario soon after Independence witnessed severe socio-economic problems like income inequalities, low employment, regional imbalances in economic development, lack of trained manpower, weak industrial base, inadequate investments, infrastructure facilities etc.

In order to counter these grave issues, the country adopted planned economic development polices, which set the premise for development of PSUs through the Industrial Policy Resolution 1948 which actively involved the State in development of industries. Initially, the public sector was confined to core and strategic industries. Strategic CPSEs are in the field of Arms & Ammunition, allied defence equipments, military aircrafts, Atomic Energy and Railways. All other CPSEs are considered non-strategic. [13] Subsequently, nationalization of industries, takeover of sick units from the private sector and entry of public sector into new fields like manufacturing consumer goods, consultancy, contracting, transportation followed. [13] Liberalization of economy in 1991 and Defence Procurement Policy DPP 2016 guidelines have opened the general economy and Defence sector respectively, to private investments.

PSUs have been the backbone of industrial development right from financial backing through banks to infrastructure to establishment of steel plants.

PSUs classified as Public Sector Enterprises (PSEs), Central Public Sector Enterprises (CPSEs) and Public Sector Banks (PSBs) [13] have stood the test of time even in the face of severe economic downturns in the world, due to their strong social cause aimed at ***inclusive and non-capitalist growth*.**

In this age of profit maximization, price manipulation, protectionist and monopolistic policies in private sector, it is the public sector which raises above all these motives and seeks a higher motive for its sustenance. PSUs play a key role in nation building activities like elevating the poor, food and consumer goods for society, roads and infrastructure to ensure growth, electricity to villages, educating the poor, social causes, strengthening the armed forces' capability etc which creates a healthy balance between the economies, equitable distribution and social development bridging the income divide. [13]

Since Independence, the PSU sector has been the most consistent and prominent sector that has contributed to the Indian economy in all the following areas:

1. Contribution to GDP and generation of income:

The share of public sector in net domestic product (NDP) at current prices has increased from 7.5% in 1950-51 to 21.7 % in 2003-04. [14] While the share of the gross turnover of CPSEs to the Gross Domestic Product during 2014-15 was 15.9% [17] even in face of global slowdown, which is all the more reason to infuse growth in this sector. Overall net profit of all 244 CPSEs during 2015-16 stood at Rs. 1,15,767 crore compared to Rs. 1,02,866 crore during 2014-15, showing a growth in overall profit of 12.54%. [20]

2. Capital Formation:

The share of public sector in gross domestic capital formation has increased from 3.5% during the First Plan to 9.2% during Eighth Plan. [14] Capital Employed in all CPSEs stood at Rs. 19,68,311 crore on 31.3.2016 compared to Rs. 18,66,944 crore as on 31.3.2015, a growth of 5.43 % while Total Investment in all CPSEs stood at Rs. 11,71,844 crore as on 31.3.2016 compared to Rs. 10,95,554 crore as on 31.3.2015, growth of 6.96%. [20]

3. Employment generation:

In 1971, the sector offered employment opportunities to about 11 million people, in 2003 it was 18.6 million, a 69% increase and employment generation in 2003 was 69% of total employment generated in the country. [14] CPSEs employed 12.34 lakh people in 2015-16 compared to 12.91 lakh in 2014-15, showing a reduction by 4.42%. [20]

4. Infrastructure:

Public sector investment on infrastructure sectors like power, transportation, communication, basic and heavy industries, irrigation, education and technical training has been instrumental for attracting private investments as well as triggering agricultural and industrial development. [14] [21]

5. Strong Industrial base:

The industrial base of the economy has been consolidated and made robust with the development of public sector industries in various fields like—iron and steel, coal, heavy engineering, heavy electrical machinery, petroleum and natural gas, fertilizers, chemicals, drugs etc.

The development of private sector industries is dependent on the strong industrial base forged by the public sector, providing a perfect setting for the rapid industrialization in the country. [23]

6. Export Promotion and Import Substitution:

PSEs have worked consistently for export promotion and import substitution. The foreign exchange earning of PSEs rose from Rs. 35 crore in 1965-66 to Rs. 34,893 crore in 2003- 04. PSEs like Hindustan Steel Limited, Hindustan Machine Tools (HMT) Limited, Bharat Electronics Ltd., State Trading Corporation (STC) and Metals and Minerals Trading Corporation have been involved in contributing through exports. [14] Foreign exchange earnings through exports of goods and services stood at Rs. 1,03,071 crore in 2014-15. [20]

Foreign exchange outgo on imports and royalty, know-how, consultancy, interest and other expenditure decreased from Rs. 5,44,561 crore in 2014-15 to Rs. 3,88,045 crore in 2015-16 showing a reduction of

28.74%. [20] PSEs like Bharat Heavy Electricals Limited (BHEL), Bharat Electronics Ltd., Indian Oil Corporations, Oil and Natural Gas Commission (ONGC) [23] have helped in saving foreign exchange through import substitution of high-end electronics, niche technologies, oil and fuels.

7. Contribution to Government Treasury:

PSEs contribute high revenues to the Treasury regularly in the form of dividend, excise duty, custom duty, corporate taxes etc. This contribution has increased from Rs. 7,610 crore in 1980-81 [14] to Rs. 2,00,593 crore in 2014-15 and to Rs. 2,78,075 crore in 2015-16, showing a growth of 38.63% in just a year. [20]

8. Check on Monopoly and on concentration of Income and Wealth:

The issue of inequalities in income and wealth distribution can be addressed through diversion of profits for the welfare of the poor people, undertaking measures for labour welfare and also by producing commodities for mass consumption.

9. Removal of Regional Disparities:

Some of the divisions of Public sectors have been opened in remote locations and less-developed states like Bihar, Orissa, and Madhya Pradesh. [14]

The current state of the economy as evident in the India Exclusion Report 2016 brings into focus the fact that even as the Indian economy grew, the inequality between the rich and the poor, has widened with a drastic fall in jobs. Job creation has been consistently falling over the years adding very few jobs, mostly of low quality and fell to 1.35 lakh new jobs in 2015 when India's economy grew 7.52 percent per annum. [10] The last fifteen years has seen tremendous growth in the economy which has been pre-dominantly services-led, however, as evident, it ***has been a jobless growth***. In view of recent developments world over, there is a looming uncertainty in Indian college campuses over employment of fresh STEM graduates.

The India exclusion report stresses the importance and growing relevance of PSUs in its contribution to the society, national security, self-reliance, export promotion, regional equality and employment opportunities that cannot be gauged from the lens of quantifiable numbers alone. [16]

IV Journey of DPSUs - HAL and BEL and their successful collaborations

Aerospace manufacturing is a high technology industry that produces "aircraft, space vehicles, aircraft engines, propulsion units, and related parts". Its value chain is characterized by a long project life cycle

spanning R&D, engineering design, manufacturing, assembly, maintenance, repair and overhaul that mandate significant investments in R&D and quality control. [4]

HAL as the pioneer in country's Aerospace industry has contributed immensely to mission of self-reliance and earned the reputation of being the "Force behind the forces". The volatile and changing business environment offers HAL an opportunity to review its strategy and re-jig itself as the leader in developing a sustained Aerospace ecosystem in the country.

Founded in 1954, Bharat Electronics was set up to provide electronics, primarily for India's defence, with the overall objective being eventual self-reliance in electronics.

The company is now one of the top technology organizations in the country today. Being initially a technology adaptor, the organization has come a long way to become a Technology innovator. BEL is highly regarded for their star products of high quality – Automatic Electronic Switch and Electronic voting machine. As a product differentiator with flexible problem solving approach, the company has offered the defence forces modernized equipment with assured quality at low cost, enhanced features on adapted products and also onsite support which has forged a strong stakeholder relationship of BEL with the Defence forces. [19]

V Evolving roles of PSEs - Business scenario analysis in a VUCA world

Globalization and open international market has forced most of defence organisations to look for opportunities to sustain their market presence in wake of intense competition, few buyers, diminishing margins, supply chain constraints, budget limitations, need for sustaining high technological expertise, talent management, speed of technology change and obsolescence at a faster rate than ever before.[5] [1]

The first strategic insight any Industry needs to develop is foresight of the trends in market needs, technological changes and competitive forces. Scenario building and extrapolating forecasting approaches are used to map the future landscape. [7]

Some of the public sectors like ITI and HMT believed that they would continue to be lead drivers and mould industry in their segment and downplayed the impact of market forces and technological changes and so could not catch up.

Meanwhile, other PSUs foresaw the unfolding scenario and did major re-jigging of their strategies to sustain and grow in a competitive environment even when they didn't have undisputed control over the market or business. Some companies like ONGC and BHEL diversified making 'Collaborative' efforts

including joint ventures and joint marketing in areas where the PSUs don't possess adequate penetration and addressed issues of operational efficiencies, quality and customer support imperatives.[7]

The PSUs can no longer influence the industry and Government as the owner should encourage and enable them to evolve and execute breakthrough strategies. However, wherever there are complementary PSUs in industry, they need to network and synergise their respective strengths rather than having an adversarial relationship. PSUs need to acts as Propellants of economic growth through technology infusion and building up of the supply chain capabilities of the ecosystem which will truly make them leaders with evolving roles. [7]

VI PSEs as harbingers of technology

HAL's role as a PSU in propelling Economic growth through technical upgradation and supply chain capability is noteworthy. The Aerospace industry paves the way for entry of Aerospace technology into the country and HAL is the pioneer in this aspect. The company has acted as a catalyst to drive technology entry through partnerships, license production (MiG series, Jaguar, Sukhoi-30, Hawk aircraft), collaborative designs, production through partnerships and through indigenous products (Advanced Light Helicopter, Light Combat aircraft).

The key technologies developed include:

(i) Composites

(ii) Smart materials

(iii) High precision manufacturing

BEL's R&D focus started way back in its early years as the company realized that R&D focus will ensure wider markets for the organization with roadmaps drawn for future products, acquisition of key technologies and filing of patents. [21] The 'CATCH' EW system, joint initiative of DLRL-BEL, Phased array radars, Flycatcher radar in association with DRDO labs are some of the shining examples. The evolution of BEL from a Technology follower and Adaptor to an Initiator – developing products in anticipation of requirement and assuming the role of a Technology Innovator is a testimony to this fact.

VII PSEs as propellants of Indigenous supply chain ecosystem

The PSEs not only develop in-house capabilities but also support ancillary units, MSMEs etc upgrading capabilities of supply chain to meet increasing demands.

a. Leading Supply chain for Automobile, machine tools and allied tertiary sectors, upgrading capabilities to meet AS standards in terms of equipments, processes, quality systems by partnering with HAL

b. Developing supply chain in niche areas – Mg, Ti/composite machining which is not prevalent in the industrial ecosystem

c. Aspects of Stakeholder and Procurement management have to be imbibed in ensuring effective supply chain which is wide in sourcing and dependable on delivery aspects.

The key areas of supply chain developed include:

(i) Composites

(ii) Smart materials

(iii) Precision components

VIII PROJECT MANAGEMENT APPROACH TO driving growth

There is a growing need for PSUs to adopt best practices in Project management in order to take the lead in propelling the volatile environment and contribute to economic growth and technological capabilities. It is suggested that such a transformation could be characterized by adopting the 'Anticipatory' and 'Collaborative' approaches as response to challenges, strengthening the business process through comprehensive scenario analysis and 'predictive planning' approach with alternative action plans. [18]

Increased autonomy of decision making within the realms of public accountability and probity, both at the organizational level and the operating level, effective change management and 'proactive business approach in the areas of business scenario analysis, contingency planning, and risk management would create an environment conducive to radical and disruptive innovations at DPSUs. [7] Refer fig 1. [18]

Some of the Project Management techniques that can be adopted by DPSUs to respond to VUCA environment include:

Fig1: VUCA in HAL

A. Early and Deep stakeholder engagement

- Supply chain uncertainty:

In order to tackle the uncertainty in supply chain, HAL is in process of converting from a vertically integrated organisation to lead integrator building capabilities more than ramping up capacity. Another measure involves developing supply chain especially Tier-II and Tier-III suppliers and MSMEs for prospective products. [18]

- Technology complexity:

Project management is a vital tool for technology management in terms of technology risks and Organisational Process Assets (OPAs) of the ecosystem. Technological complexity and obsolescence could be dealt by development of incubation centres for futuristic technologies in collaborative mode. HAL and BEL have jointly initiated the formation of Defence Innovation and Research Institute (DIRI) which is a major step in this regard. Also, HAL and BEL had signed an umbrella MoU in May 2016 that includes sharing of expertise in design, development, engineering and manufacturing to develop and produce advanced airborne communication, electronic warfare systems aimed at greater indigenization and self-reliance in defence technologies. This collaboration will support the 'Make in India' mission.

- Industry-academia collaboration:

Establishment of joint chairs with leading technological institutes like IITs ensuring sustained growth, ushering culture of innovation at low cost and knowledge repository enrichment besides fulfilling the common objective of providing service to the nation.

- Skills ambiguity :

As the industry is growing, there will be huge shortfall in skilled manpower in terms of industry–ready technicians, engineers and managers. Development of Aviation Skill sector council (ASSC) has been

initiated by HAL wherein around 60 skills specific to aerospace have been identified for designing and conducting training programmes on skill development for diploma trainees for absorption into the industry.

- Competitor uncertainty :

Competition from other players in the industry and new entrants is rising by the day and it can be handled effectively by the establishment of JVs with competitors to convert competition to collaboration.

B. Strategic risk Management

- Market risk mitigation :

(i) Investing in multiple question marks in the BCG portfolio matrix like Unmanned aerial vehicle (UAV), Naval rotary unmanned aerial vehicle (NRUAV), Unmanned combat aerial vehicle (UCAV) projects bu HAL which have potential to herald a leap in the Aerospace capabilities of country and BEL would be doing in new strategic areas like Electronic Ammunition Fuzes, Homeland Security Solutions, Navigational Complex Systems and Inertial Navigation Systems in line with the emerging needs of Customers. [15]

(ii) Scenario analysis and back casting –It is a potent tool to envisage the future and plan since defence projects have high gestation period. (Examples for HAL include Indian multi-role helicopter IMRH, 25 KN engine, Sukhoi fighter aircraft)

- Technology risk mitigation :

(i) Embracing Open system architecture in new product development such as Mission computers in order to have the technological agility to respond to changes in engineering.

(ii) Investing in products of the future – this is required for developing technology today for products of tomorrow (Examples for HAL include Cryogenic engine, 25 KN engine, UAV, UCAVs) [18]

BEL is working closely with DRDO labs, other research and academic institutions and niche technology companies for development of new products and systems. The important projects planned include Akash Weapon System, 3D TCR, Weapon Locating Radar, Schilka Upgrade, Communication Equipment, Night Vision Devices, L70 upgrade, IACCS etc. [19]

C. Scope management and assumptions analysis

Scope management is a critical parameter wherein understanding the customer requirements and scope of deliverables is vital. It should involve questioning the assumptions which is essential to remove

impediments put forth by the triple constraints. Clarity of implicit assumptions in the early stage of project leads to lesser uncertainty during execution stage. PSEs have learnt this most vital aspect the hard way with lot of scope changes due to changing customer needs and high expectations.

D. Robust Change management processes:

While a fully defined scope is desirable in any project, the evolving technology and changing requirements of military applications necessitate changes during all project phases. Defence projects being of a long duration type, technologies and scope envisaged during the beginning of the project undergo multiple changes during execution stage and a robust change control mechanism enables successful completion of projects. The response to VUCA should be built into the processes. [18]

E. HR management:

There is an increasing need to create a 'Learning organisation' nurturing new and expansive patterns of thinking by effective knowledge management, talent management and HR management including formation of cross-functional teams fostering innovation. [2]

IX New age role of PSEs - Engines of growth of Indian economy

The public sector is bracing up to face challenging market scenarios in wake of paradigm shift in government policy and adopting distinct corporate strategies to hold their ground. [12]This paper seeks to stress the important place of PSEs in Indian economy in bringing in following vital aspects of economic growth:

(i) Robustness
(ii) Sustainable growth
(iii) Technology-infused growth
(iv) Growth leading to job creation

PSUs are serving basic needs of the country and more importantly, leading Indian industry's modernization efforts to compete at the global market. [12]

According to a Deutsche Bank report, Indian PSUs are the ones to kick-off capital expenditure right now following a sharp rise in their operating cash flow and free cash flow. The report says that this could drive fresh capex to about $60 billion on large projects over the next two years in sectors like mining, road, power, housing, defence, and urban infrastructure. [22]

The present economic situation of increasing protectionism warrants fresh attention to the need to pursue manufacturing-led inclusive growth provided by PSUs to save economy from uncertainty in the services

sector. The domestic demand across various sectors is huge which is being capitalized by foreign business players which could be well met by strengthening and supporting the public sector saving huge Forex, immunity from world economic performance and driving domestic markets.

X CONCEPTS AND LESSONS FOR THE FUTURE

Based on the experiential studies of two major DPSUs, their projects, industry analysis, SWOT analysis, VUCA studies and analysis of the evolving roles of CPSEs, it can be surmised that the increased liberalization of the economy to propel growth in changing and dynamic situations is not the ultimate solution but building on the strengths of established industries like CPSEs to boost manufacturing-led growth is the panacea for robustness and sustenance of economic growth. The growing sentiment of protectionism will hamper services-led growth compelling other sectors to contribute to the economic growth wherein manufacturing comes into play. There are some challenges posed by the industry and changing geo-political dynamics for DPSUs that necessitate them to focus on innovative new products, tackling technology obsolescence to meet the requirements of prevalent and future warfare and defence scenarios. This underlines the need to revamp the product portfolios of the DPSUs and work on collaboration mode to effectively tap into defence requirements.

XI CONCLUSION

While there are a host of critical success factors that drive sustainable economic growth through evolution of PSEs, there is also little doubt about the indispensable role that accelerated project management initiatives perform in their implementation.

Therefore, the key to sustenance and being engines of the country's growth in the VUCA world for DPSUs like HAL and BEL, is the need for being harbingers of technology entry into the country, creating a sustainable supply chain creating jobs, leading the VUCA, encouraging 'Collaborative' and 'Anticipatory' attitudes to be built into the business strategy as well as in the process of managing portfolios/projects to deal with unpredictable situations that offer a truly sustainable competitive advantage and in turn script a great growth story for the nation.

References

[1] Roger Moser, Heiko A. von der Gracht and Tobias Gnatzy,– The Indian Aerospace industry 2019-BrainNet Science Edition 2010

[2] Peter.M.Senge –"The fifth discipline: The art and the practice of the Learning organization"

[3] Dr.Laxman Kumar Behera – India's Defence budget 2015-16 – The Institute for Defence Studies and Analysis Issue Mar 2015

[4] Report of working group on Aerospace sector

[5] Report by CII & KPMG on unlocking the potential for Indian Aerospace & Defence Sector

[6] ( )"New business diversification of HAL as a Lead Industrial Trainer-Combined role of Industry and Academia" - National Seminar on "Indigenous technology base for growth of Aerospace ecosystem" Nov 2015

[7] ( ) "Strategising in a VUCA world: A PSU perspective

[8] Vikram Bhalla, Senior Partner & Director of BCG – "Leadership and Talent management" – Corporate Dossier July 24-30, 2015

[9] Nassim Nicolas Taleb – "The Black Swan"

[10] India Exclusion Report, 2016, Yoda Press

[11] PricewaterhouseCoopers report on "2016- Aerospace and defence trends".

[12] Central Public Sector enterprises, Leading companies of India Inc,

[13] Public sector enterprises in India, India.gov.in Archive

[14] Vidya Sethy - Roles Played by Public Sector in Indian Economy

[15] Excerpts from the speech of Chairman, BEL – moneycontrol.com

[16] Ranjan Kumar Mishra, Importance of PSU in Indian Economy –LinkedIn, Oct 2016

[17] Press Information bureau, Ministry of Heavy Industries and Public Enterprises, Nov 2016

[18] () Need for Ambidexterity for Business Transformation in HAL, PMI RAC 2017

[19] Krishnan.S, Prabhala.S, Koshy.V.K, Inside the Solid State, Westland Ltd

[20] SCOPE – Standing Conference on Public Enterprises, PSUs at a glance, 2017

[21] Rohan Khanna, What is the role of public sectors in India?

[22] Tushar K Mahanti, Indian PSUs rediscovering their potential, Business economics, Jan 6th 2016

[23] Bhimasen Hantal, Contribution of Public Sector in Indian Economy