सत्यमेव जयते
Department of Science & Technology
Govt. of India

DST-Centre for Policy Research at PU, Chd.
(DST/PRC/CPR-03/2013)

REPORT – 2

Stimulation of Private Sector Investment in R&D: A Global Comparison

(April, 2016 – July, 2017)

Countries	Tax credits	Tax deductions	Patent box	Financial support	Risk coverage	IP jurisdiction (location specific)
USA	✓	✗	✗	✓	✓	✗
UK	✓	✓	✓	✓	✓	✓
China	✗	✓	✓	✓	✓	✗
Japan	✓	✗	✓	✓	✓	✗
S. Korea	✓	✗	✓	✓	✓	✗
Singapore	✗	✓	✓	✓	✓	✗
France	✓	✗	✓	✓	✓	✗
Israel	✓ (Reduction in corporate tax rate)		✗	✓	✓	✗
India	✗	✓	✓ (2017 onwards)	✓ (limited support)	✗	✗

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1. Introduction

With the onset of the 21st century, emerging need and importance of knowledge and research driven industries for sustainable growth and economic development of the nation is being widely realized. One of the major key drivers for the country's development is generation and uptake of scientific innovations. These innovations are the result of high-end innovative research practices undertaken by the public (government and academia) and private sectors (industry). Developed and developing nations are continuously strengthening their national research and development (R&D) ecosystem by revisiting R&D support mechanisms. Worldwide, countries have come up with impactful steps in their R&D strategy to stimulate increased involvement and expenditure in research by public and private sectors. Globally, total R&D investments for the year 2016-2017 has accounted nearly 2.099 million (USD in purchasing power parity; Global R&D Forecast 2017) and the large lump of investments is contributed by the private sector. Private sector composed of industrial units is one of the foremost contributors to the economic development of any country. To enhance the competitiveness of a business, innovations have become an important driver for generating new genera of products/processes/technologies addressing socio-economic needs of the nation. Globally, most of the national governments have come up with the R&D incentivization programs specific for the private sector in order to boost their productivity and contribution to the R&D to evolve as competitive companies. In most of the developed economies (USA, Japan, Singapore, etc.) and emerging economies (China, S. Korea, etc.) of the world, private sector investments in R&D are almost double in comparison to the public sector investments in R&D. On the other hand, in India 2/3rd of R&D investments are incurred by the public sector and the only 1/3rd of the R&D investments are delivered by the private sector. India needs to strengthen and stimulate the private sector for investing in R&D to generate more competitive companies at par with foreign companies to deliver cost-effective. Indian Government has continuously made efforts to stimulate private sector investment in R&D by introducing a tax benefit regime for private sector engaged in R&D along with funding support for pursuing R&D projects. In spite of continuous efforts, the aim of the Indian government to achieve public to private investments in R&D under 1:1 range by 2017 remains yet to be accomplished.

Keeping in mind, the need to stimulate private sector engagement in R&D in India, we need to understand the R&D incentives availed globally to identify relevant R&D enablers practiced globally for the invigorating private sector in R&D. In this context, the government came up with the Joint Committee of Industry and Government (JCIG) under the aegis of Department of Science and Technology in 2013. The committee issued the white paper on 'Stimulation of Investment of Private Sector into Research and Development in India' in 2013 concentrating on five major tasks, which were as:

1. Studying global practices and classification of R&D heads as practiced globally
2. Revalidating the data on private sector investments into R&D in India
3. Identifying key enablers for stimulating private sector investments into R&D
4. Studying various policy instruments deployed by other countries for maximizing the provisions and benefits of PPP for R&D as tools of change in manufacturing and
5. Suggesting measures for implementation with industrial sector driving the desired changes in the private sector

In order to address the majors tasks defined by the committee, DST-Centre for Policy Research at PU, Chd. has undertaken a study on comparative analysis of global R&D incentives in select countries (USA, China, Japan, Germany, S. Korea, Singapore, U.K., France and Israel) to draw relevant lessons for India. The above-mentioned countries were selected on basis of their large share in global R&D investments and foremost participation of private sector in R&D ecosystem (nearly 80%) in comparison to the public sector (nearly 20%) of these countries respectively.

The report consists of following sections:

Section 1: Global R&D investments and selection of countries for comparative analysis

Section 2: Pattern of R&D investments in select countries

Section 3: R&D incentivization implemented in select countries

Section 4: Relevant lessons for India

Section1: Global R&D Investments

Innovative research practices have become one of the key sources for generation of new processes, products, and technologies that can be explored in national and international markets to bring out mankind's benefit. Substantial investments in R&D activities are required to promote national innovation ecosystem. The R&D processes and the costs associated with R&D varies from country to country and year to year. The total global share of R&D expenditure touched $ 2.066 trillion in power purchasing parity in 2017 with the growth of 3.4% for 115 countries worldwide (Global R&D Forecast 2017). As per the continental share in world R&D expenditure, Asia with 24 countries is leading in R&D investments (more than 42% of total R&D expenditure) in total followed by Europe (34 countries), North America (12 countries), Russia (5 countries), Middle East (13countries) and South America (10 countries) (Figure 1). Asian countries such as China, India, Singapore, South Korea, etc. from past decade has undertaken impactful initiatives to enhance their R&D investments for building self-reliant technological advancements.

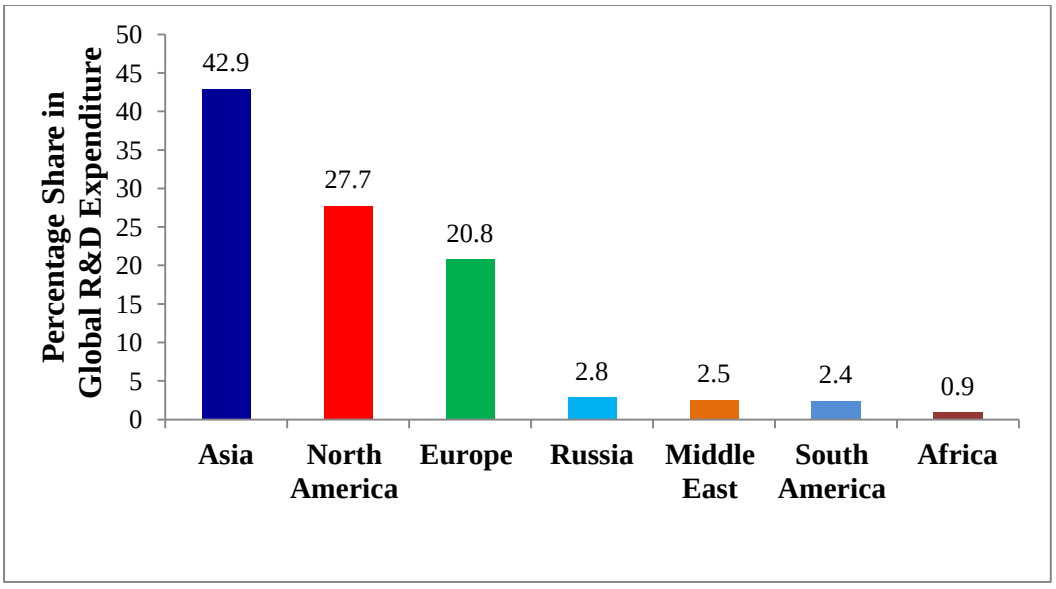

Figure 1: Percentage share of global R&D experience of continents in 2017 (forecasted)
Source: *Global R&D Forecast 2017.*
(http://digital.rdmag.com/researchanddevelopment/2017_global_r_d_funding_forecast?pg=1#pg1)

Figure 2 represents top 10 nations of the world that significantly invest in R&D in terms of Gross Expenditure on Research and Development (GERD) value. The US holds the topmost

position in the chart with $ 527.46 billion PPP in 2017 (forecasted) followed by China ($ 429.54 billion PPP). From past 50 years, US is been outpacing other nations in R&D investments. The strong network of academic institutions, research organizations along with industrial units and number of federal programs to support R&D activities in the US have led to advancing R&D activities in the country that has drawn the substantial amount of investments. On the other hand, China has shown the significant increase of 7.1% in their R&D spending in 2017 compared to 2015. It is expected, China with the current growth rate of R&D investments will out pass US numbers in R&D spending by 2026.

Countries such as Japan and Germany fall under the bracket of $ 100-200 billion in PPP investments in R&D. Rest of the countries depicted in figure 2 have less than $ 100 billion in PPP GERD numbers starting with South Korea, followed by India, France, Russia, U.K., and Brazil. India ranks 6th globally in terms of GERD, being the first developing nation to compete with developed nations (France, Russia, and U.K.) in R&D investments.

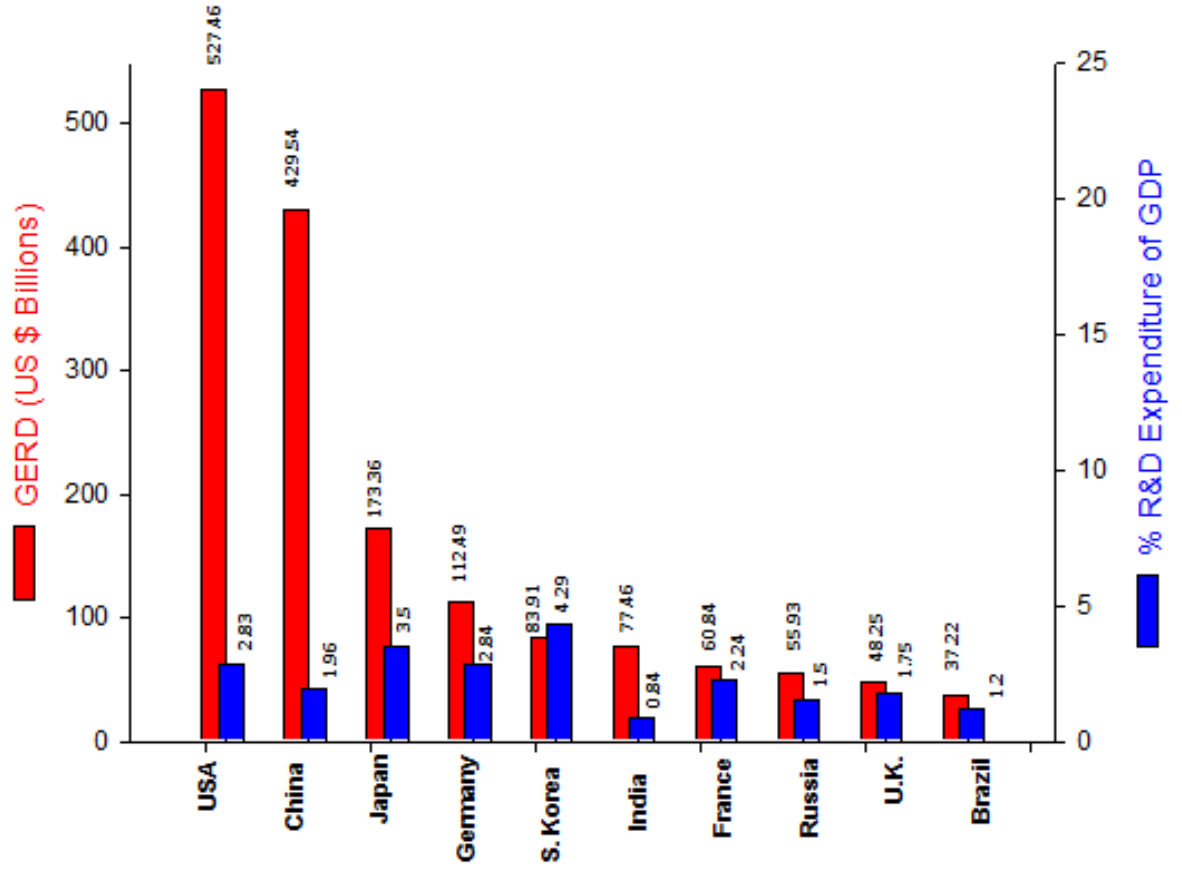

Figure 2: Top 10 countries as per GERD values (2017 forecasted) and their % R&D expenditure as % of GDP

Source: *: Global R&D Forecast 2017.*
(http://digital.rdmag.com/researchanddevelopment/2017_global_r_d_funding_forecast?pg=1#pg1)

In spite of India being in the top 10 list of R&D investments, it has the lowest percentage of R&D Expenditure (0.84%) as part of total GDP of the country. South Korea with 4.84% of R&D expenditure from its GDP spends highest globally for R&D from its total GDP value followed by Japan (3.50%), Germany (2.84 %), US (2.5 %), France (2.24%), China (1.96%), U.K. (1.75%), Russia (1.50%) and Brazil (1.20%). South Korea is strongly committed to the R&D expansion in the country by strengthening workforce and generation and fortification of knowledge-intensive competitive firms with well-built infrastructure.

Technological advanced nations of the world-USA, China, Japan, Germany, S. Korea, U.K., Singapore, France and Israel which are exceptionally doing well in R&D (Global R&D Forecast 2017) were selected for carrying out detailed review of R&D incentivization followed in these countries to draw relevant lessons for India.

Section 2: Pattern of R&D investments in select countries

The industry is the major propellers for the R&D in most of the innovation based countries worldwide. Innovative practices adopted by the companies has led them to emerge as competitive and self-sufficient. Many of the industries have rightly exploited their R&D potential for generating in-house intellectual property (IP) to evolve as a leader in their research domain. Along with the active participation industry, national governments also put substantial investment in R&D to promote the technological growth of the country. It is essential to review public to private sector contribution to R&D to determine major R&D players and devise ways to strengthen them for national economic development. The pattern of R&D funding under different sources such as government, industry and other nongovernment service organizations for select countries in terms of global R&D investments is presented in Figure 3.

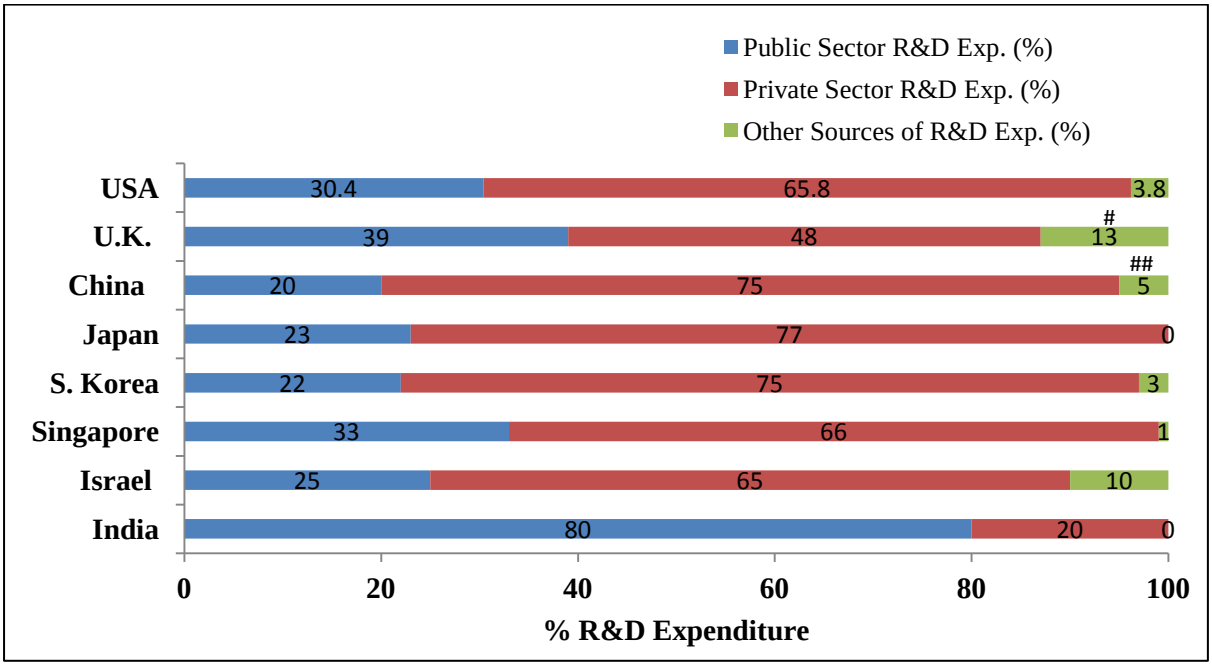

Figure 3: Pattern of R&D Funding in Leading Countries
Source: *Global R&D Forecast 2017; Patil A and Biswas S, 2014; http://ec.europa.eu/eurostat/statistics*
Other sources consist of NGOs, non profit organizations, etc.
#: consist of non for profit and offshore accounts; ##: in sourcing

International Scenario

As highlighted in Figure 3, all the select countries have more than double private to public sector contribution for R&D investments. In the US, the majority of R&D (two-thirds) is

carried out by various industrial organizations. Top five innovative industrial organizations in US are presented in Table 1.

Table 1: Top five Innovative Companies of US

2016 Global Rank	Company	Research Domain	R&D Spending ($ Billions)
1.	Amazon	Software & Internet	12.5
2.	Alphabet	Software & Internet	12.3
3.	Intel Co.	Computing & Electronics	12.1
4.	Microsoft	Software & Internet	12.0
5.	Johnson & Johnson	Healthcare	9.0

Source: *2016 Global Innovation 1000 Study(https://www.strategyand.pwc.com/innovation1000)*

Under public sector, academic institution mainly goes ahead with basic research, while private sector heavily invests in developmental and applied research. On the other hand in China, industry invests in R&D three time more in comparison to the government, some of the major publically listed companies, highly investing in R&D in China are described in Table 2.

Table 2: Top R&D Investing Companies of China

S. No.	Company	Research Domain	Global ranking
1.	Alibaba Group Holding Ltd.	Internet	61
2.	ZTE Corp.	Telecommunications	70
3.	PetroChina Co. Ltd.	Petroleum	73
4.	China Railway Group Ltd.	Mechanical Engineering	86
5.	Baidu Inc.	Internet	88

Source: *http://www.chinadaily.com.cn/business/tech/2016-10/27/content_27185564.htm; https://www.strategyand.pwc.com/innovation1000*

The industry carries out business-related R&D, while the basic research is carried out by different government agencies of China. Much of R&D is directed by Chinese Academy of Sciences (CAS) under Ministry of Science and Technology (MoST) (Global R&D Forecast 2017). Under CAS, more than 20 enterprises (such as, KYKY Technology Co., Ltd.; Shanghai Bi Ke Clean Energy Technology Co., Ltd.; Shenzen CAS IP Investment Ltd.; CAS Science and Technology Service Co., Ltd.; SKY Technology Development Co., Ltd., etc.) have been set to direct industrial research in the country (http://english.cas.cn/institutes/companies/index.shtml). In Japan also, the industry

contributes majorly to the R&D funding (77%) and private sector is the major sector that has undertaken research in Japan under independent in-house research centers and through academic collaborations (Global R&D Forecast 2017). The similar pattern is also noticed in South Korea, where industry carries out magnums amount of research that has strongly contributed to the emergence of South Korea as one of the major industrial revolutions in shortest time frame. Singapore has become the favorite destination for multinational companies setting up their research centers in Singapore. The industry is also the major R&D performer (66%) in Singapore followed by academic institutes (23%) and research organizations (10%). In spite of the small size, Singapore is leading in the number of scientist, engineers, and researchers generated per capita (Global R&D Forecast 2017).

Indian Scenario:

In comparison to other major R&D investing countries, the pattern of R&D funding in India is totally reverse. In India, one third of R&D is supported by the private sector and rest of two third of R&D is funded by the government sector. India has developed one of the largest higher education systems in the world and majority of R&D is carried out in universities, institutes of national importance and national research laboratories. However, these universities are not world class and lack in R&D profile in terms of publications and patents. The huge amount of R&D funding (nearly 75% of total country's R&D expenditure) is carried out by various government agencies under major 27 ministries in India (JCIG, White Paper 2013). On the other hand, private sector contribution in scientific research is appallingly low at 25% of total R&D expenditure. The pattern of R&D expenditure by the public and private sector in various domains is specified in Table 1 and 2 (http://www.nstmis-dst.org/). As highlighted in Table 1, the data shared by GoI for 2009-10, the public sector was a major contributor to the research in almost every field (e.g. defense, space, energy, agriculture and basic research, etc.).

Table 1: Sector-wise R&D Investments under Public and Private Sectors in India (2009-10)

S. No.	Sector	Public sector's R&D Expenditure (₹ in lakhs)	Private Sector's R&D Expenditure (₹ in lakhs)	Total R&D Expenditure (₹ in lakhs)	Public to Private Sector R&D Expenditure Ratio
1.	Agricultural	6836.79	913.14	7749.93	**7.5**
2.	Environment	427.15	153.43	580.58	**2.8**
3.	Defence	9479.16	227.04	9706.21	**41.8**
4.	Space Technology	4312.1	20.48	4332.58	**210.5**
5.	Exploration of the Earth	1512.76	221.27	1734.02	**6.8**
6.	Industrial Production and Technology	3236.98	2621.06	5858.04	**1.2**
7.	Infrastructure	584.61	4290.78	4875.39	**0.13**
8.	Non-oriented Research (Basic Research)	5578.09	292.18	5870.26	**19.1**
9.	Energy	3474.04	344.28	3818.32	**10.1**
10.	Human Health	2021.33	5654.29	7675.62	**0.35**
11.	Social Structures and Relationships	188.06	133.43	321.5	**1.4**
12.	Other Aims	84.69	181.79	266.48	**0.5**
13.	**Total R&D Expenditure**	**37735.76**	**15053.17**	**57121.51**	**2.5**

Source: *http://www.nstmis-dst.org/ (2009-10); last updated in 2015(after extensive prior art search, our centre was unable to track latest information on Public and private sector expenditure in R&D, lack of such information may hinder in analysing and bringing out recommendations for stimulating private sector investments in R&D in India)*

Table 2: Breakdown of Public Sector Investments in R&D in India (2009-10)

S. No.	Sector objectives	Central Government's R&D Expenditure (₹ in lakhs)	State Governments' R&D Expenditure (₹ in lakhs)	Other Public Sector's R&D Expenditure (₹ in lakhs)	Total Public sector's R&D Expenditure (₹ in lakhs)
1.	Agricultural	3239	3590.57	7.22	6836.79
2.	Environment	402.5	24.65	0	427.15
3.	Defence	8498.89	0	980.27	9479.16
4.	Space Technology	4312.1	0	0	4312.1
5.	Exploration of the Earth	796.79	44.56	671.41	1512.76
6.	Industrial Production and Technology	2082.37	79.87	1074.74	3236.98
7.	Infrastructure	553.41	5.44	25.76	584.61
8.	Non-oriented Research (Basic Research)	5527.45	50.6	0.04	5578.09
9.	Energy	3419.23	2.56	52.25	3474.04
10.	Human Health	1952.08	66.37	2.88	2021.33
11.	Social Structures and Relationships	187.44	0.62	0	188.06
12.	Other Aims	84.69	0	0	84.69
13.	Total R&D Expenditure	31055.95	3865.24	2814.57	37735.76

Source: *http://www.nstmis-dst.org/ (2009-10)*

Moreover, only 0.8% of the country's GDP is targeted for R&D, which is quite low in comparison to other countries such as South Korea (4.29); Japan (3.5); China (1.96); Singapore (2.19) etc. The major reasons behind low private sector involvement in Indian R&D ecosystem lie in a) majority of Indian industries fall under medium and small scale bracket and b) lack of government support for private companies engaged in R&D business. India globally ranks second in number of MSMEs in the world which employs more than 40% of the workforce and associated with 45% of manufacturing activities (http://msme.gov.in; http://www.gktoday.in; 2015). Due to lack of funding, these enterprises do not actively take up research to improve their stature. Government programs for funding private sector research are quite limited in India in comparison to other western nations in North America and Europe where federal governments provide more than 55% of total funding to private sector research (Global R&D Forecast 2017).

The 12th five-year plan aimed at increasing percentage R&D investment to 2% of GDP from current value of 0.8% of GDP of which public and private sector should invest 50:50 (http://planningcommission.gov.in/plans/planrel/12thplan/welcome.html). India is at the end of its 12th five-year plan has not been able to achieve its ambitious target of achieving enhance private sector engagements in R&D investments in India. To address the need for engaging private sector in R&D NITI Aayog constituted 'Expert Committee on Innovation & Entrepreneurship'. The major highlights of the committee report were as:

Major challenges for Innovation and Entrepreneurship in India:

- *Trust deficit between the government and private sector*
- *Lack of incentive structures*
- *Lack of adequate business incubators*
- *Gaps in education and work-readiness*
- *A disabling business environment*
- *Stigma over failure*

Steps needed to overcome challenges:

- *Harnessing corporate funds to finance R&D*
- *Improving the efficiency of incubators*
- *Strengthening links between the corporate sector and incubators*
- *Strengthening the intellectual property (ip) rights regime*
- *Foster a culture of coordination and collaboration*
- *Improving the ease of doing business: this has targeted for enhancing the private sector involvement in R&D activities*
    - ✓ *Digitization of government permits*
    - ✓ *Revisit the companies act*
    - ✓ *Tax compliance*
    - ✓ *Move service tax back to actuals rather than accruals*
    - ✓ *Improving access to capital*
    - ✓ *Creating an online portal to aggregate information on funding*
    - ✓ *Creation of a separate regulatory category for new business*

Source: *Report of the Expert Committee on Innovation and Entrepreneurship, 2015 http://niti.gov.in/writereaddata/files/new_initiatives/report-of-the-expert-committee.pdf*

Government is continuously seeking for private sector participation in R&D as stated in various government released white papers (Stimulation of Investment of Private Sector into Research and Development in India, 2013; Sectoral Innovation Council on Industrial R&D, 2013) and expert committee reports [Report of the Expert Committee on Innovation and Entrepreneurship, 2015; Committee Report on Corporate Participation in Higher Education (Narayana Murthy Committee Report) 2012; Innovation in India, NKC, 2007]. To stimulate private sector engagements in R&D, it is essential to review present system of incentivization of private sector by government to promote R&D and determine the gaps in incentivization scheme by carrying out comprehensive analysis of the incentivization programme executed by federal governments of select countries as discussed in coming section.

Section 3: Global Comparison of R&D Incentives

For the present report, we have studied in depth the R&D incentives prevailing in countries (USA, China, Japan, Germany, S.Korea, Singapore, U.K., France and Israel) based on their top ranking in terms of global R&D investments and active participation private sector in countries R&D regime.

Through this report, our Center has categorized various R&D incentivization under following categories as presented in figure 3.

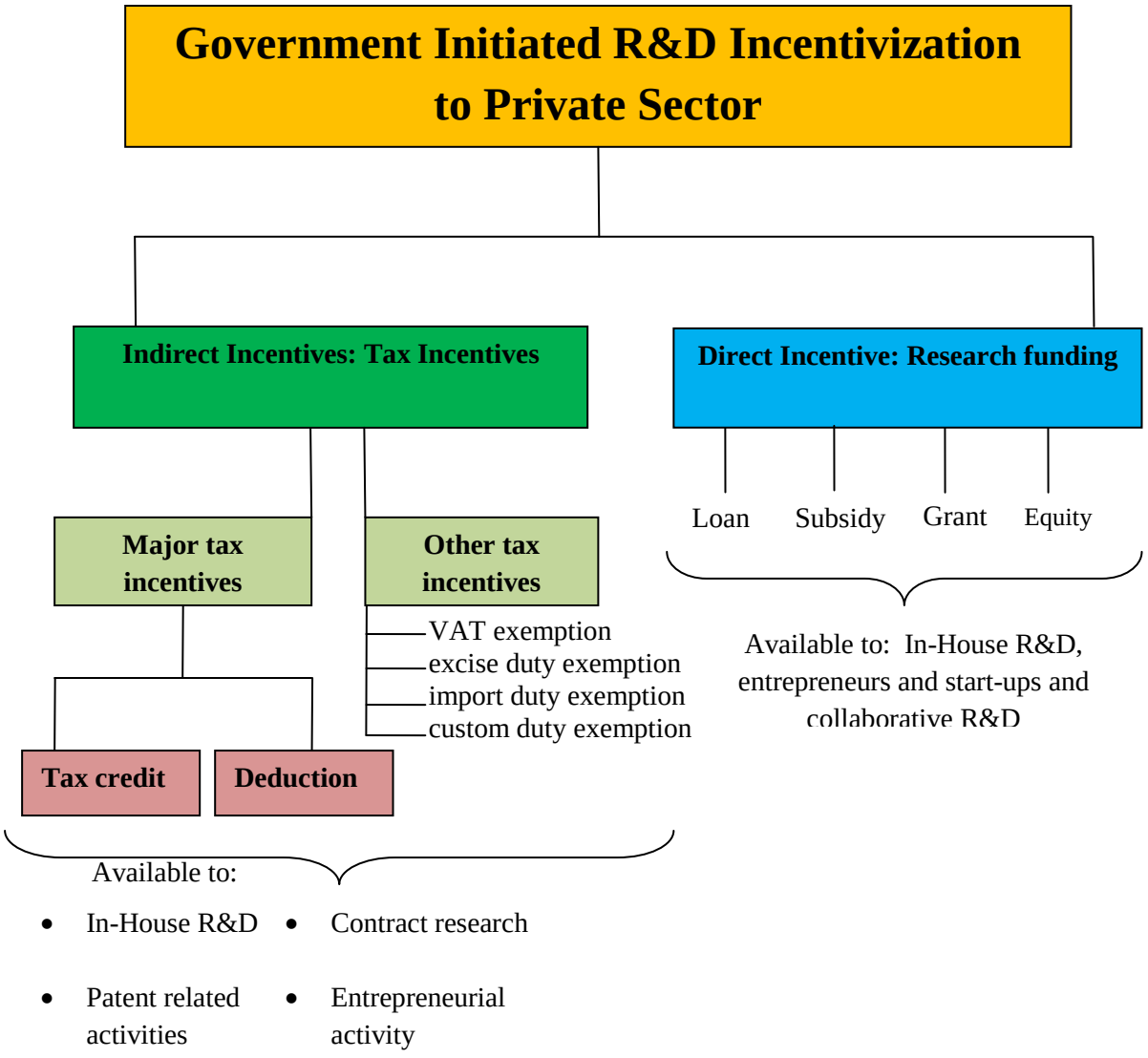

Figure 3: Categorization of R&D Incentives Availed Globally

Worldwide, there are two types of incentives for R&D. The first category is the direct incentive that includes funding industrial R&D and second category includes indirect incentivization by provided tax incentives on R&D expenditure. The share of both direct and indirect incentivization for R&D excelling countries considered in our study is presented in figure 4. In countries like S. Korea and Japan, significant percentage of GDP (0.19 and 0.14) is subjected to R&D tax incentives, respectively. Whereas, in country like USA, significant percentage of GDP (0.18) is accounted for financially supporting private industries in pursuing their R&D projects. Majorly utilized R&D incentivization falls under tax incentives. The tax support provided in countries USA, China, Japan and South Korea is presented in figure 5.

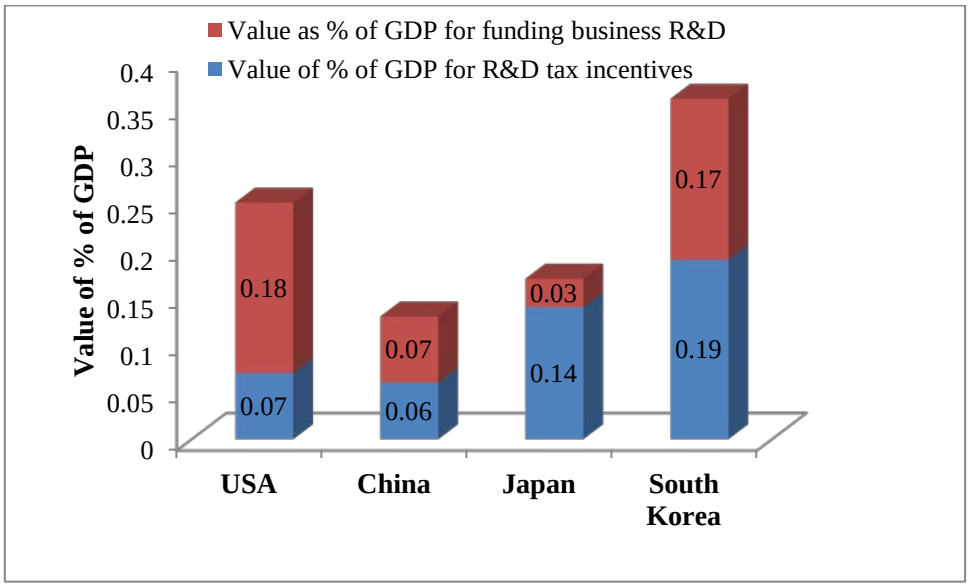

Figure 4: Share of Indirect and direct incentivization in country's GDP

Source: *http://www.oecd.org/sti/rd-tax-stats.htm; data is for 2014*

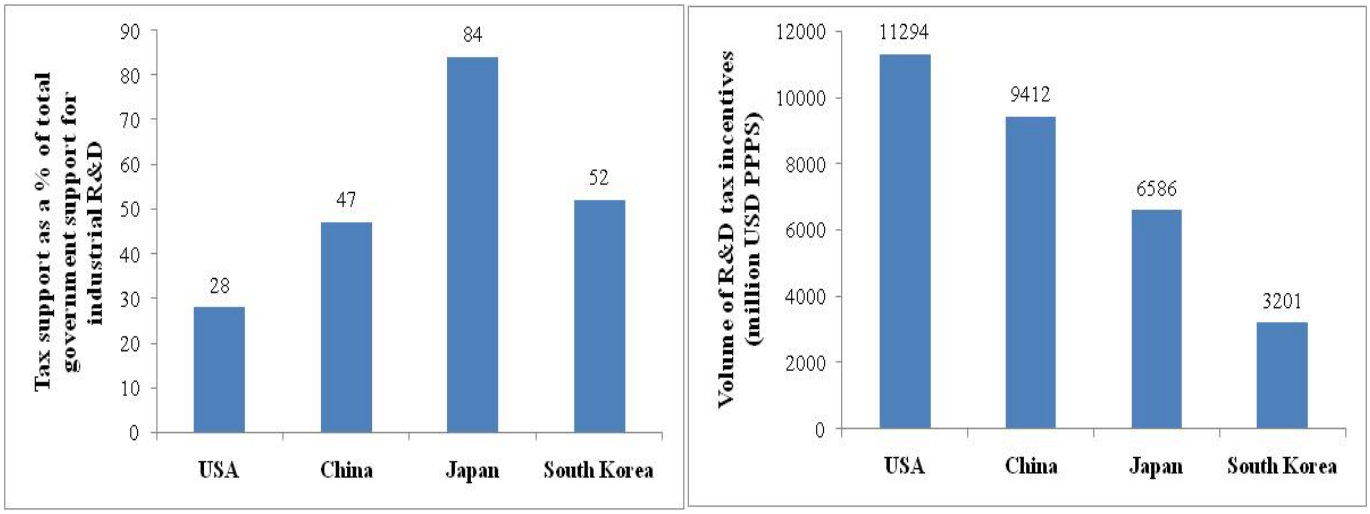

Figure 5: Volume of tax support for industrial R&D

Source: *http://www.oecd.org/sti/rd-tax-stats.htm; data is for 2014*

Our study comprise of the comparative analysis of the R&D incentivizing government schemes for private sector engaged in R&D. The comparative analysis has been carried out under four subheads which are as:

- ***Eligibility and qualified research expenditure***
- ***Intellectual property (IP) and R&D location Jurisdiction***
- ***Tax Incentives***
- ***Funding support***

The context of each subhead in terms of R&D incentivization has been described in Appendix I.

Table 2: R&D Incentivization followed in Select Countries

Country	Funding Support	R&D Tax (Combined)	R&D Tax Credit	R&D Tax Deduction	Volume Based	Incremental Based	Refundable	Carry Forwarded	Preferential Tax Incentives		Patent Box	CAPEX Incentives
									SMEs	Collaboration		
USA	√	√	√	**n.s.**	×	√	√ **(Payroll taxes for start-ups)**	√	√ **(for start-ups)**	×	√	√
China	√	√	**n.s.**	√	×	×	×	×	×	×	√	×
Japan	√	√	**n.s.**	**n.s.**	√	√ **(for high end R&D intensity)**	×	×	√	√	×	√
Germany	√	×	×	×	×	×	×	×	×	×	×	√
S. Korea	× **(limited)**	√	√	**n.s.**	×	√	×	√	√	×	√	√
Singapore	√	√	**n.s.**	√	×	×	×	×	×	×	×	×
UK	√	√	√	√	√	×	√ **(for SMEs)**	√	×	×	√	√
France	√	√	√	**n.s.**	√	×	√	√	√	√	√	√
Israel	√	√	**n.s.**	√	×	×	×	×	×	×	×	×
India	× **(limited)**	√	**n.s.**	√	√	×	×	√ **(only in case of losses)**	×	×	√	√

Compiled from2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD
n.s: .not specified

Details of other countries is provided as Appendix II

Comparative analysis of R&D Incentivization carried out in Select Countries

1. Eligibility and Qualified Research Expenditure:

Countries	Eligible Industries	Qualified Research Expenditure	Nonqualified Research Expenditure
USA	All industries	➢ Wages for in-house labor ➢ 65% of contract research ➢ Supplies used in the research process ➢ Costs incurred to construct a pilot model ➢ Expenses incurred for developing software	➢ Overhead expenditure ➢ Capital expenditure
China	All industries except negative list industries which are: ➢ Tobacco ➢ Hospitality and catering ➢ Wholesale and retail ➢ Real estate ➢ Rental and commercial services ➢ Entertainment	➢ Labor expenses (including labor costs for external personnel) ➢ Direct expenses incurred in the R&D project ➢ Depreciation expenses* (even if the equipment is not used exclusively for R&D) ➢ Amortization expenses** ➢ Design and testing expenses (including testing expenses for trial products) ➢ Expert consultation ➢ High and new technology R&D insurance*** ➢ IP application costs ➢ Travel and meeting costs. ➢ Up to 80% of fees paid to contractors to perform research on the taxpayer's behalf qualify	Expenses related to R&D activities carried out by contractors that are foreign organizations or individuals

**Depreciation expense* *is the allocated portion of the cost of a company's fixed assets that are appropriate for the accounting period indicated on the company's income statement. It includes noncash payments associated with the industry work will add to the income of the industry (definition by Accounting Coach)*

***Amortization* *is the paying off of debt with a fixed repayment schedule in regular installments over a period of time. It includes spreading out of capital expenses for intangible assets over a specific duration (usually over the asset's useful life) for accounting and tax purposes. (Definition by Investopedia).*

****R&D insurance* *is an innovative insurance product that allows companies in the R&D chain to cover their unique risk exposures in the context of their business and funding models (http://www.riskcan.ca/r-d.html).*

Japan	All industries	➢ In-house labor costs ➢ R&D supplies ➢ Overhead[****] ➢ Depreciation on fixed assets ➢ Contract costs	Research expenses that are funded by unrelated entities (government agencies, customers, suppliers, etc.)
Germany	Industries in following sectors: ➢ Manufacturing and production processes ➢ Automotive and transportation ➢ Biotech and life sciences ➢ ICT ➢ Energy and utilities	➢ Personnel Costs ➢ Materials ➢ Overhead ➢ Subcontracting ➢ Amortization ➢ Travel Costs	-
S. Korea	Dedicated R&D center of the corporation or the corporation's internal R&D department, both of which should be registered with the Government	➢ Labor costs (salaries, wages, bonuses, etc.) ➢ Materials costs (samples, parts, and raw materials used in the conduct of R&D) ➢ Rent for R&D equipment ➢ Commissions paid to the qualifying body ➢ Training costs ➢ Other costs (trademark development costs, design development costs, consulting fees, and quality guarantee costs).	➢ Legal and administrative activities such as protection of patent rights, etc. ➢ Research activities on contract basis

********Overhead*** *expenses are all* ***costs*** *on the income statement except for direct labor, direct materials, and direct expenses. Overhead expenses include accounting fees, advertising, insurance, interest, legal* ***fees****, labor burden, rent, repairs, supplies, taxes, telephone bills, travel expenditures, and utilities.*

Singapore	All industries	➢ Wages and salaries ➢ Materials ➢ Utilities incurred directly for R&D activity	Capital expenditure on plant, machinery, land, or buildings, or on alterations, additions, or extensions to buildings, or in the acquisition of rights arising in or arising out of R&D
U.K.	All industries	➢ R&D Staff costs ➢ Software or consumable items used in the R&D ➢ Payments to volunteers for participating in clinical trials ➢ 65% of R&D-related subcontracting costs(for SMEs) ➢ Can claim subcontracting costs only if they are paid to a university, health authority, charity, scientific research organization, individual, or a partnership of individuals (Large Companies)	Expenditure on rent, land, patents, and patent protection
France	All industries *(Contractors performing research on a time/materials basis can claim tax credits for their qualified research expenses)*	➢ R&D staff expenses ➢ General and administrative expenses ➢ Depreciation allowances for assets used for R&D activities in France ➢ Patent costs ➢ Contract research costs (*there is a cap on private subcontracted expenses equal to three times all other qualifying expenses, but in no event can the subcontracted R&D fees exceed EUR 12M*) ➢ Costs of technological monitoring	Materials used in the research process
Israel	All Industries approved by Innovation Authority	➢ In-house R&D costs	Not specified

	The Innovation Authority implements the government's policy to encourage and support industrial R&D that is likely to lead to new export products and international commerce. Incentives may be available if an applicant is approved by the Innovation Authority and meets "disruptive technology" innovation standards.	➢ Materials and consumables ➢ Consultant and subcontractor costs ➢ Patent registration, application costs for regulatory approval ➢ Capital investments and overhead	
India	**All industries** Some of the major tax incentives can only be availed by DSIR recognized industries with following essential requirements: ➢ The R&D unit must be located in a separate earmarked area ➢ The R&D unit must have its own personnel ➢ The company must maintain a separate account for each approved facility, which must be audited annually ➢ Assets acquired with respect to the development of scientific R&D facilities may not be disposed of without the approval of the Secretary of the DSIR	➢ Wages ➢ Supplies ➢ Utilities ➢ Other expenses directly related to R&D ➢ Expenses incurred in clinical drug trials only if pre-approved by the regulatory authority under a central, state, or provincial act and a patent application is filed under the Patents Act (1970) for the new drug/therapy developed through the clinical trials.	➢ General and administrative costs ➢ Depreciation ➢ Overhead and allocated expenditure ➢ Expenditure on R&D in following fields: beer, wine, alcoholic spirits, tobacco and tobacco preparations, cosmetics and toilet preparations, toothpaste, dental cream, tooth powder and soap, aerated waters, confectionary and chocolates, gramophones, projectors, photographic equipment and office machines, such as calculators and cash registers.

Source: *2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-PWC; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD*

2. IP Jurisdiction and location limitations

Countries	Location specificity for R&D activities	Location specificity for IP specificity
USA	YES	NO
China	YES ➢ R&D activities must be conducted in China ➢ Less than 40% of the R&D expenses qualifying for the high-new technology enterprise (HNTE) incentive is allowed to be incurred outside China.	YES The IP must be held by the Chinese applicant in China
Japan	NO The qualifying costs incurred by a Japanese company are eligible for the research credit even if the research is conducted outside of Japan.	NO
Germany	YES	NO ➢ The IP created through the research (initially) remaining in Germany/E ➢ Large multinational companies with IP relocated to headquarters outside Germany also may qualify for funding under certain conditions.)
S. Korea	NO R&D activities of the company regardless of where the R&D activities are carried out, except for research subcontracted to academic institutions; which must be located in South Korea.	NO
Singapore	YES ➢ R&D activities undertaken in Singapore. ➢ If R&D payments are made by a Singapore entity to a R&D organization for R&D performed outside Singapore, a claim for deduction may be allowed. ➢ Special approval from the Minister (advance application with the Singapore Economic Development Board is required) for RISC/IDC grants.	Not specified
U.K.	NO	NO
France	NO	NO
Israel	NO	NO

India	YES ➢ The company must be registered in India. ➢ The main object of the company must be scientific R&D ➢ The company must be approved by the Chief Commissioner of Income Tax and DSIR, GoI	NO ➢ No location restriction with respect to IP ➢ IP can reside outside the country subject to ownership remaining with the Indian Company who has undertaken such R&D ➢ Foreign patent filing expenditure is not allowed as a weighted deduction.

Source: *2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-PWC; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD*

3. Tax Incentives

Countries	**Tax Incentives**			
	Direct Tax Incentive	**Indirect Tax Incentive**	**Patent Related Tax Incentives**	**Start-up incentives**
USA	**1. Research Tax Credits** ➢ Incremental specific (Computed on an increment of qualified research spending exceeding a base amount.) ➢ Nonrefundable ➢ Unused credits can be carry forwarded for 20 years and carry back for 1 year ➢ Three types: ***a. Traditional Research credit: 20%*** (Credit on incremental Spending with Limitations) ***b. Alternative Research credit: 14%*** (Credit on incremental Spending without Limitations ***c. Targeted Research credit: 20%-basic research; 20%-Energy Research Consortium & 50%-clinical research for orphan drugs***	No	No	➢ Research credits to offset Alternative Minimum Tax (AMT) by companies with average annual gross receipts <50 million ➢ Research credits can be used to reduce payroll taxes by companies with average annual gross receipts <5 million.
China	1. **Super deduction** ➢ Non-refundable ➢ 50% Deduction on volume	➢ VAT/Custom duty incentives (Non-	Annual income from qualified technology transfers is exempted	No

	➢ Can be carried forward for 5 years (in case of losses) **2. Reduced tax rates for High-New Technology Enterprise (HNTE)-15% reduced** **3. Reduced tax rates for Technology Advanced Service Enterprises (TASE)-15% reduced** **4. Preferential Tax Incentives (10% tax credit) for using energy saving technologies**	refundable) ➢ Tax Holidays for software companies ➢ Exemption from import duties for software companies	from enterprise corporate tax	
Japan	**1. Volume-Based Tax Credit** ➢ Nonrefundable ➢ Unused tax credits may not be carried forward. ➢ 17% tax credit for Small and Medium-Sized Entities (SMEs) ➢ 6-10% tax credit for Large Companies ➢ 30% tax credit for special R&D costs **(**R&D with a university or public research institution) **2. Additional Incremental tax credits (capped at 30% based on incremental R&D Expenditure): increment in period of two years** **3. 50% tax credit for machinery and R&D equipment/fixtures used in specified businesses within the zones that are conducive to international competitiveness or the formation of hubs for international business.**	No	No	No
Germany	No	No	No	No
S. Korea	**1. Tax Credit** ➢ Nonrefundable ➢ Unused R&D credits may be carried forward for the following five years. ➢ A tax credit for SMEs: 50% on incremental and 25% on volume. ➢ A tax credit for medium sized companies: 40% on	No	➢ A patent box also is available to SMEs: 50% tax exemption on IP transfer and 25% of	No

	incremental and 8% on volume. ➢ A tax credit for large sized companies: 30% on incremental and 3% on volume. **2. 30% Additional R&D tax incentives** on qualified expenditure related to New growth engine industry **3. Investment tax credit for R&D equipment (1% for large companies; 3**% for medium-sized companies and 6% for SMEs) **4. Additional Tax credit for investing in facilities for energy-saving (1% for large companies; 3**% for medium-sized companies and 6% for SMEs)		lending) ➢ SMEs acquire a patent (7% exemption on the amount paid to acquire the patent.) ➢ SMEs lend a qualified patent (25% of the related income from such lending is exempt from tax.)	
Singapore	**1. Super deduction under Productivity and Innovation Credit (PIC) Scheme** ➢ Nonrefundable ➢ When R&D expenses exceed taxable income, the excess may be carried forward and set off against future taxable profits ➢ 100% deduction depending on the approval from the related authority. **2. 50% additional deduction if it falls under the year 2009-2025 period.** **3. Additional super deduction for R&D projects carried out in Singapore and approved by the Economic Development Board (EDB)** **4. Double tax deduction (200%) on R&D expenditure incurred on approved projects.**	No	Provides reduced or no withholding tax on royalty payments to access advanced technology and know-how.	Angel investors 50% tax deduction for two year holding period.
U.K.	**1. Volume-based super deductions (230% deduction)** ➢ Super deduction scheme is available for SME (fewer than 500	No	➢ 10% rate of corporation tax	

	employees and either gross revenue not exceeding EUR 100M or gross assets not exceeding EUR 86M.) ➢ Refundable ➢ Carry forward for indefinite period **2. Research and Development Expenditure Credit (RDEC) Scheme: Volume-Based Tax Credits (11%)** ➢ Tax credits are available for large companies ➢ Higher tax credit of 49% available for companies working in petroleum oil extraction (these companies also has higher corporate tax rates on their respective profits in comparison to other countries) ➢ Non refundable ➢ Carry forward for indefinite period **3. Cash credits for SMEs in loss positions, up to 33.35% of qualifying expenditure**		to profits generated from qualifying patents and developing technology associated with it. ➢ The "new" regime requires claimant companies to track their R&D expenses and how they relate to specific patents, products, or product families, creating a much stronger link between the R&D tax relief and the patent box regime.	
France	**1. Volume-Based R&D Tax Credit** ➢ Nonrefundable for large companies ➢ SMEs, new companies, young innovative companies, and companies with financial issues can request immediate refunds of unutilized credits. ➢ carried forward for three years ➢ R&D credit equal to 30% of the first EUR 100M of qualified R&D expenditure incurred during the tax year. The rate is reduced to 5% for qualified R&D expenditure exceeding that amount, and the 30% rate is increased to 50% in overseas territories.	No	Income from licensing (and the sub-licensing of eligible IP rights as from 2011) or the sale of patent or patentable technology are taxed at a maximum rate of 17%	Young innovative company (YIC) status: Specific measures apply to support new companies investing more than 15% of their spending on R&D. these measures are: • Two-year decreasing corporate income tax exemption (100% for the first profitable year and

	2. Innovation tax credit, is available to SMEs for certain pilot-model and prototype developments that do not qualify for the 30% R&D credit.			50% for the second year) • Exemption from taxes such as the *taxe foncière, Contribution Foncière des Enterprises (CFE),* and *Contribution sur la Valeur Ajoutée des Entreprises* (CVAE) upon request for up to seven years • seven-year capped exemption of certain employer social security contributions for R&D staff remuneration
Israel	**1. Alternative tax program** ➢ Non-refundable ➢ Carry forwarded ➢ Tax benefits are granted to industrial companies that export more than 25% of their total turnover to a market larger than 14 million persons. ➢ A corporate tax rate of 7.5% applies to companies located in "Priority Area A," and a 16% applies to companies located in other areas. **2. Strategic program incentives** ➢ The program is intended for multinational companies whose annual gross receipts exceed ILS 10B, invest a minimum of ILS 100M in R&D projects, and hire at least 250 new employees. ➢ Reduced tax rate of 5% in Priority Area A and 8% in other areas.	No	No	Angel Investor Scheme: A tax benefit is granted to individuals investing in qualified Israeli R&D companies, allowing them to deduct their investment from any other source of income. The amount of the deduction is capped at ILS 5M per investor, per eligible company.

India	1. **Super Deduction for in-house R&D expenditure** ➢ Nonrefundable ➢ If the taxpayer is in a loss situation, unused benefits may be carried forward for the following eight years, but cannot be carried back. ➢ The R&D facility must be approved by the Department of Scientific and Industrial Research (DSIR) for a company to qualify for the super deduction. ➢ 150% super deduction for carrying out R&D activities in the in-house center 2. **150% super deduction for specified payments made to certain scientific research associations, approved universities, colleges, or other institutions.** **3. 100% super deduction for specified payments made to a scientific research company/ research association/university/college/other institution for the purpose of scientific and statistical research.** **4. 100% tax exemption for the first five years, starting from the year manufacturing commences, followed by a 50% tax exemption for the following five years on export profits earned from a new undertaking set up in a Special economic zones.**	➢ Customs duty exemption on goods imported for R&D ➢ Duty-free import for Biotech and pharma units ➢ Central excise duty waiver for 3 years ➢ Reimbursement of countervailing duties (CVD) and excise duties on capital equipment under M-SIPS	10% tax rate on royalty income from the patent.	100% deduction for start-ups if engaged in field of innovation Or Tax holiday for three consecutive years.

Source: *2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group PWC; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD*

4.Funding Support

Countries	Major Funding Agency	Some of the Major Funding Programmes
USA	US Federal Government	➢ Small Business Innovative Research Program (SBIR) ➢ Small Business Technology Transfer Program (STTR) ➢ Advanced Research Projects Agency-Energy (ARPA-E) ➢ Partnerships for Innovation: Accelerating Innovation Research - Research Alliance (PFI:AIR-RA) ➢ Partnerships for Innovation: Accelerating Innovation Research - Technology Transfer (PFI:AIR-TT) ➢ Partnerships for Innovation: Building Innovation Capacity (PFI:BIC) ➢ NIH Centers for Accelerated Innovations (NIH/NCAI) ➢ Public-Private Investment Programme (PPIP)- Legacy Securities and loans are provided ➢ Industry/University Cooperative Research Center (I/UCRC) Program ***Risk undertaking Guarantee Scheme:*** State Small Credit Initiative (SSBCI): The state provides collateral and accepts burden of repayment to the financial institution
China	➢ Ministry of Science and Technology (MoST) ➢ National Natural Science Foundation of China (NSFC) ➢ Chinese Academy of Science (CAS) ➢ China Scholarship Council (CSC)	➢ National High-Tech Research and Development Programme ➢ National Key Technologies R&D Program ➢ Agriculture S&T Achievement Industrialisation Fund, etc. ➢ Innovation and Technology Support Programme (ITSP) ➢ The Research Grants Council Collaborative Research Fund ➢ The Research Grants Council Joint Research Schemes
Japan	Japan Science and Technology Agency (JST)	➢ Collaborative Research Based on Industrial Demand ➢ Center of Innovation (COI) Program ➢ A-STEP (Adaptable and Seamless Technology Transfer Program through Target-driven R&D) ➢ S-Innovation (Strategic Promotion of Innovative Research and Development) ➢ Technology Development Program for Advanced Measurement and Analysis (Program-T) ➢ Software Development Program for Advanced Measurement and Analysis (Program-SW) ➢ Prototype Validation / Practical Realization Program for Advanced Measurement and Analysis

		(Program-P) ***Risk undertaking Guarantee Scheme:*** Japan Bank for International Cooperation Loan Guarantee Scheme: Government organization guarantees and accepts the burden.
Germany	➢ German Research Foundation (DFG) ➢ German Academic Exchange Service (DAAD)	➢ Grants for R&D ➢ KMU-innovativ ➢ Central Innovation Program for SMEs (ZIM) ➢ German Federal State Funding ➢ New High-Tech Strategy Programme ➢ Horizon 2020 *For large enterprises, cash grants are awarded of up to 50% of eligible costs, with a 10% bonus possible for SMEs, depending on the specific calls.* ***Risk undertaking Guarantee Scheme:*** German United Loan Guarantees: Government provides financial guarantees for loans should the firm be unable to repay.
S. Korea	➢ National Research Foundation ➢ Korea Institute for Advancement of Technology (KIAT)-specifically woking for industrial technology ➢ Korea Energy Technology Evaluation and Planning (KETEP) ➢ Small & Medium Business Administration (SMBA)	➢ New Technology Purchasing Assurance ➢ Korea Credit Guarantee Fund ➢ Knowledge Partnership Korea Fund for Technology and Innovation ➢ Research funds under National R&D Program ➢ Creative Research Initiative
Singapore	**Singapore Government under:** ➢ SPRING ➢ Agency for Science,	➢ Industry Alignment Fund ➢ Capability Development Grant (CDG) ➢ SPRING's Partnership (PACT) programme ➢ TechBridge Ventures

	Technology, and Research (A*STAR)	➢ SME Energy Efficiency Initiative ➢ Singapore government start-up tech ➢ Critical Infocomm Technology Resource Programme Plus (CITREP+) ➢ Global Company Partnership (GCP) Grant ➢ Innovation & Capability Voucher (ICV) ➢ Operation & Technology Roadmapping (OTR) ➢ Productivity Innovation Project (PIP) Scheme ➢ SME Talent Programme (STP) ➢ Technology Adoption Programme (TAP) ➢ Research Incentive Scheme for Companies (RISC)/Innovation ➢ Development Scheme (IDS)
U.K.		➢ R&D grant (EU) ➢ R&D grant (national)
France		**If a company receives a subsidy or grant for an R&D project, this may affect how much tax relief it can claim. The aid rates generally amount to around 25% for large and medium-sized companies and 40% for small companies.*
Israel	Innovation Authority *The main program of the Innovation Authority supports R&D projects in Israel by offering conditional grants of up to 50% of approved R&D expenditure (up to 60% in Priority Area A and up to 75% in the area surrounding the Gaza Strip). If the R&D project is successful, the company must repay the grant by making royalty payments from future related revenue.*	➢ Tnufa program ➢ MAGNET program ➢ Binational funds ➢ Horizon2020 ➢ EUREKA funding platform *Special benefits for selected areas: Israel offers special benefits for R&D undertaken in special fields, including: (i) traditional industries, such as food and beverages, textiles, print, metal, and plastics; and (ii) non-traditional industries, such as cyber security, the space industry, and alternative fuels. There also are special benefits for start-ups and new companies.*
India	➢ Technology Development Board (TDB), Department of Science and Technology (DST) ➢ Department of Scientific and Industrial Research (DSIR)	TDB, DST, GoI: ➢ Project Finance Scheme ➢ Seed Support Scheme ➢ Venture Capital Fund ➢ International S&T Co-operation: setting up of Indo-French Centre for Promotion of Advanced Research (IFCPAR / CEFIPRA), Indo-US Science & Technology Forum (IUSSTF) and Indo-German Science &

	➢ Biotechnology Industry Research Assistance Council (BIRAC), Department of Biotechnology (DBT) ➢ Ministry of Electronics and Information Technology (MeitY)	Technology Centre (IGSTC) DSIR, GoI: ➢ Building Industrial R&D and Common Research Facilities (BIRD-CRF) ➢ Patent Acquisition and Collaborative Research and Technology Development (PACE) ➢ Promoting Innovations in Individuals, Start-ups, and MSMEs (PRISM) ➢ Access to Knowledge for Technology Development and Dissemination (A2K+) ➢ Technology Development and Demonstration Program (TDDP) ➢ Technopreneur Promotion Programme (TePP) ➢ Technology Management Programme (TMP) BIRAC, DBT, GoI: ➢ Small Business Innovation Research Initiative (SBIRI) scheme ➢ Biotechnology Industry Partnership Programme (BIPP) ➢ Promoting Academic Research Conversion to Enterprise (PACE) ➢ SEED Fund ➢ AcE Fund - Accelerating Entrepreneurs ➢ Biotechnology Ignition Grant Scheme (BIG) MeitY, GoI: ➢ Financial Assistance under Modified Special Incentive Package Scheme(M-SIPS) and Electronic Manufacturing Clusters EMCs schemes

Source: *2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-PWC; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD*

Details of each country with R&D incentivization is provided in Appendix III.

Section 4: Relevant Lessons for India

The comparative analysis of the R&D incentivization executing in USA, China, Japan, Germany. S. Korea, Singapore, U.K., France and Israel, our centre has come up with suggestion for enhancing Indian R&D Incentivization programme by drawing relevant lessons from the above mentioned countries.

1. Increasing scope of qualified research expenditure

In India, expenditure incurred on the manpower, materials and equipment and utilities and services is qualified for the R&D incentives by the government. There is demanding need to enhance the scope of qualified expenditure in research which includes following:

Inclusion of following attributes in qualified research expenditure	**Reference country**
Investments for availing R&D Insurance in domains of high technology investments	China
Investment cost for IP filling and maintenance	China
Investments incurred for performing contract research work	USA, China, Japan,
Overhead expenses	Japan, Germany
Expenses incurred in constructing and maintaining pilot plant facility	USA, France

India has set list of negative products which do not fall under R&D Incentivization such as, beer, wine, alcoholic spirits, tobacco and tobacco preparations, cosmetics and toilet preparations, toothpaste, dental cream, tooth powder and soap, aerated waters, confectionary and chocolates, gramophones, projectors, photographic equipment and office machines, such as calculators and cash registers. Certain product range from cosmetics to dental creams and powders, toothpaste, toilet preparations, confectionary items and electronic products like projectors and office machines are continuously evolving in their standards in accordance to the consumer's budget and quality expectation by implementing R&D activities. These products should be qualified for R&D incentivization scheme. In accordance to the recommendations from The Joint Committee of Industry and Government (JCIG) presented in white paper entitled 'Stimulation of Investment of Private Sector into Research & Development in India' released by GoI in 2013, private sector R&D investments should

also cover up costs incurred for translating R&D work involving test designing and development, standardization and field testing along with pre commercialization trial.

2. Eligibility criteria

The simplifying process of granting eligibility status to the industries to avail R&D incentives. Most of the countries implementing R&D incentivization program have simplified process of availing R&D incentives provided by the government. Indian system involves the long and complicated system of granting government recognition to the industry by means of dedicated autonomous agency 'Department of Scientific and Industrial Research (DSIR)' under Ministry of Science and Technology Recognition. DSIR provides recognition certificate that has to be renewed after every 3 years period (minimum) subjected to the lengthy process of government evaluation and assessment. It is particularly difficult for companies mainly small and medium-sized to input considerable efforts to avail incentives from the public sector.

3. Enhancing R&D tax incentivization

The majority of industries recognized under DSIR are availing tax incentives and only a few of them are dependent on R&D public funds. Figure 7 outlays the amount of tax foregone by the government in comparison to the R&D undertaken by the private sector.

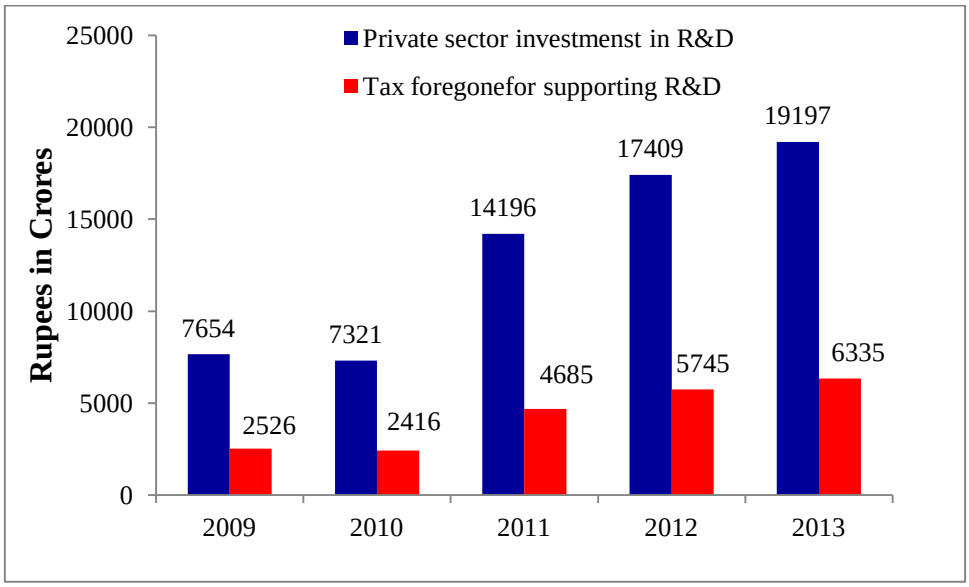

Figure 7: Tax Foregone by government for supporting R&D (2009-13)

Source: *Stimulation of Investment of private sector into research and development, DST, 2013*

Some of the suggestion for improving Indian tax incentivization in lines with R&D tax incentivization followed in other countries are presented below:

Tax incentives	**Brief details**	**Reference country**
Introduction of research credit scheme	Tax credits are more favourable than tax deductions or exemptions because tax credits reduce tax liability rupees for rupees. While a deduction or exemption still reduces the final tax liability, they only do so at an individual's marginal tax rate. Unlike deductions and exemptions, which reduce the amount of taxable income, tax credits reduce the actual amount of tax owed.	USA, Japan, South Korea
Incremental tax incentivization	In India, volume based tax incentivization is executed that benefits large tax deduction for large investments and low tax deductions for low investments. Under incremental tax incentives, the incremental amount of research expenditure in comparison to the base amount is calculated and based on increment in research expenditure tax incentivization is provided.	USA, Japan, South Korea
Target based tax incentivization	Targeted research credits/deduction should be available in India for different subject areas depending on national needs and societal improvement. In USA different tax credit slabs are functioning for research in different areas such as 20% tax credit for basic research and energy research and 50% tax credit for clinical research of orphan drugs. In China targeted group of high-new technology enterprise is provided with enhancing tax deductions. On similar lines, GoI should identify key priority areas and provide special incentives to stimulate R&D investments in these identified areas. Moreover, government should release specified are funds from its budget to promote public-private partnerships for addressing the national key challenges of the country.	USA, China, Japan, Israel
Different tax incentivization rates	Industrial research mainly comprise of large scale, medium scale, and small scale industries. Different tax	South Korea, UK

for large, medium and small enterprises	incentive slabs depending on the scale of industries should be introduced in Indian R&D tax incentivization schemes. As observed in South Korea tax credit of 50% for SMEs, 40% is for medium sized companies and 30% for large sized companies. Similarly, Japan follows 17% tax credit rates for SMEs and 6-10% for large sized companies. Implementation of such incentives will stimulate research in SMEs. As in U.K., special tax incentives to SMEs is provided that face loss situations.	
Patent related incentives	From March 2017 onwards, Patent related incentive as a fixed tax rate of 10% is available for royalty income generated from patenting activities. Whereas in other countries cost incurred in the patent filing and patent maintenance and amount spent in acquiring a patent is also considered for tax incentivization and the extent of incentivization varies with the scale of the industry.	South Korea
Incentives for angel investors	India has come up with start-up based tax incentives by providing 3 year tax holiday. In order to promote participation of private sector in start-ups through angel investing, special incentives can be provided to them.	Singapore, Israel
National tax agency for R&D	Creation of national tax agency to simplify the process of approval and accreditation of tax incentives to R&D companies as on lines of Japan should be promoted in India. This should be persuaded to simplify the process of getting government accreditation in time effective manner.	Japan
Development and expansion related tax incentives	Special development and expansion related tax incentivization as applied in Singapore can be introduced for Indian companies who wish to expand their R&D business. Despite having one of the lowest corporate tax rates in the world, Singapore offers a wide range of investment incentives for investors, including tax holidays, preferential tax rates, and grants to attract substantive Singapore inbound investment and to support business expansions in Singapore. Such fiscal tools have been used by Singapore since her independence to	Singapore

	promote economic development in the country.	
Special Tax incentives for Academic Collaborated Research	Industries pursuing collaborative research with academic institutions should be eligible for getting additional tax incentives on R&D expenditure in collaborative research work in order to strengthen Industry-Academia research participation in India. Moreover, Service Tax waiver for I-A research projects.	Japan

5. Monitoring and enhancing public funding support to the private sector

Most of the expenditure on R&D in India is contributed by the public sector. The substantial amount of R&D funding in universities, institutes of national importance and national research laboratories is sponsored by the Indian government under respective ministry heads. Direct R&D funding to the private sector is very limited. Ministry of Science and Technology through Department of Science and Technology (DST), Department of Biotechnology (DBT) and Department of Scientific and Industrial Research (DSIR) supports industrial R&D carried out by the industry itself. DST and DBT have created dedicated autonomous body namely Technology Development Board (TDB) and Biotechnology Industry Research Assistance Council (BIRAC), to cater the funding needs of private sector industry in the field of High-end research in sciences specifically focussing life sciences and biotechnology. Ministry of Electronics and Information Technology has also come up with special programs for supporting Electronic System Design Manufacturing (ESDM) sector in India.

However, to support and boost private sector R&D, Indian government should come up with dedicated programmes for supporting industrial R&D and fixed percentage of funds in each ministry should be allotted to support private sector R&D as on lines of USA, Singapore and Germany. Funding programs initiated by Singapore's government such as Industry alignment fund, tech bridge ventures, innovation and capability voucher, SME talent program and Research Incentive Scheme for companies are the perfect role model for setting up dedicated funds for industrial R&D. Moreover, in financially supporting R&D persuaded by private sector in India, it is necessary to introduce financial guarantee scheme on lines of USA (State Small Business Credit Initiative), Japan (International Cooperation Loan Guarantee Scheme), Germany (German United Loan Guarantees and cash subsidy scheme), South Korea (Korea

Credit Guarantee Fund) and Israel (MAGNET programme and cash subsidy scheme through innovation authority) to provide guarantee in order to secure huge amount of money invested by industry in R&D. Funding programs introduced by Germany and China based on targeted specific and country needs should also be introduced in Indian system to support and strengthen the innovation ecosystem as per the industrial, societal and economic needs. Horizon 2020 program initiated in Germany, National High-Tech Research and Development Programme in China and RISC and IDS programs of Singapore, can act as a role model for introducing funding programs in support of future innovations through the private sector. Especially to encourage MSMEs for contributing in R&D, a special guarantee scheme should be introduced by government through which banks can give loan to MSMEs by considering IP as the mortgage able asset (recommended by JCIG, 2013).

Miscellaneous:

- In order to carry out realistic based estimation of R&D investments by private sector, government should come up with set of guidelines in accordance to which all companies engaged in R&D activities should be mandated to disclose R&D expenditure in their annual reports and balance sheets (recommended by JCIG, 2013).
- Government should come with provisions to write off loans issued by public sector to private sector for R&D activities in case of genuine failure under one window apex system (recommended by JCIG, 2013).
- Introduction of conditional grant to private sector for commercializing their R&D outcomes (recommended by JCIG, 2013).
- A fixed percentage of commercial products, developed through R&D under PPP mode, should be purchased by the Govt.
- Adoption of robust confidentiality agreement in public institutions for joint R&D
- Creation of Special Fund for global partnership in R&D by Public and Private sector
- Extend R&D incentives to companies such as beer, wine and other alcoholic drinks; confectionary, tooth pastes, steel furniture etc. These private sectors have been restricted for seeking R&D incentives
- A right mix of loan, equity and grant-in-aid according to the stage of technology development and risk factor involved in PPP mode
- The R&D investments of private sector made under PPP, which benefits society, should be considered as a part of Corporate Social Responsibility (CSR).

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3. Worldwide R&D Incentives Reference Guide 2017-EY
4. Global R&D Incentives Group-pwc
5. Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD
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Appendix I

Eligibility and qualified research expenditure: This subhead provides the details of types of industries and their respective activities engaged in R&D that are eligible for government benefits. This section also compares the expenditure incurred on research activities that fall under qualified and non-qualified research expenditure on which the government provides various benefits.

Intellectual property (IP) and R&D location Jurisdiction: In this section, we have tried to cover location and IP specific jurisdiction of the company for availing government initiated incentives.

Tax Incentives: One of the major government initiated incentives for the private sector R&D falls under tax-related incentives for the industrial R&D expenditure taken up by a company. Tax incentives can be provided through two means, one is direct tax incentive through which tax credits and super deduction to the R&D expenditure incurred by company is availed and another one is indirect tax incentives in form of Value Added Tax (VAT), custom duties (import duties and excise duties), etc. can be availed on R&D related import and export activities. Other than direct and indirect tax incentives, some of the countries provide tax incentives on IP and entrepreneurship-related activities. Brief about the major tax incentives as mentioned below availed by the private sector in select countries is provided.

- ***Direct Tax Incentives (Tax Credits and tax deduction)***

1. *Tax Credit*: is an amount in accordance with the credit scheme which is subtracted from the total tax liability owned by the taxpayer to the government. Tax credits are generally provided to individuals or businesses under specific classification or location.
2. *Tax Deduction*: is a reduction in income that has to be taxed in the result of specific activities undertaken by individual or businesses to produce additional income.

- ***Indirect tax incentives (VAT, customs duty, import duty, excise duty, etc.)***

1. VAT: broadly based consumption tax assessed on the value added to goods and services.
2. Import duty: duties levied on import of goods
3. Excise duty: duties levied on exported goods

- ***Patent related tax incentive***
- ***Start-up tax incentives***

Funding support: This subhead provides the brief details of the major government funding agency and funding programs for supporting industry for their R&D projects. Funding is provided by four means such as:

- ***Loan:*** a sum of money that is provided by the government agency for R&D purpose which needs to be returned to an industry with added interest in specified time frame.
- ***Grant:*** a sum of money given by the government to the industry for the specific purpose without the need to return it back to the grant provider.
- ***Equity:*** a sum of money provided by the government to the company for the specific purpose of which in return government holds a portion of the share of the same company in accordance to the investment.
- ***Subsidy:*** a sum of money is provided by the government to the company to maintain the price fluctuation of the specific products.

Appendix II

R&D Incentivization Followed Worldwide

R&D Incentives / Country	Funding Support	R&D Tax (combined)	R&D Tax Credit	R&D Tax Deduction	Volume based	Incremental based	Refundable	Carry Forwarded	Preferential Tax Incentives		Patent Box	CAPEX incentives
									SMEs	collaboration		
Angola	×	×	×	×	×	×	×	×	×	×	×	×
Australia	√	√	√	n.s.	√	×	√ (for SMEs)	√	√	×	×	√
Austria	√	√	√	n.s.	√	×	√	×	×	×	×	√
Belgium	√	√	√	√	√	×	√	√	×	√	√	√
Brazil	×	√	n.s.	√	×	×	×	×	×	×	×	√
Canada	√	√	√	n.s.	√	×	√ (for SMEs)	√	√	×	×	√
Croatia	√	×	×	×	×	×	×	×	×	×	√	√
Czech Republic	√	√	n.s.	√	×	×	×	×	×	×	×	√
Greece	√	√	n.s.	n.s.	×	×	×	×	×	×	√	√
Hungary	√	√	√	√	√	×	×	√	×	√	√	√
Iceland	√	√	n.s.	n.s.	√	×	√	×	×	√	×	×
Ireland	√	√	√	n.s.	√	×	√	√	×	×	√	√
Italy	√	√	√	n.s.	×	√	×	×	×	×	√	√
Latvia	√	√	n.s.	√	×	×	×	×	×	×	×	√
Lithuania	√	√	n.s.	√	×	×	×	×	×	×	×	√
Malaysia	×	√	n.s.	n.s.	×	×	×	×	×	×	×	√
Mexico	√	√	n.s.	n.s.	×	×	×	×	×	×	×	×
Netherlands	√	√	n.s.	n.s.	×	×	×	×	×	×	√	√
Poland	√	√	n.s.	√	×	×	×	×	×	×	×	√
Portugal	√	√	√	n.s.	×	√	×	√	√ (for	×	√	√

									start-ups)			
Romania	√	√	**n.s.**	√	×	×	×	×	×	×	×	√
Russia	√	√	**n.s.**	√	×	×	×	×	×	×	×	√
Slovakia	√	√	**n.s.**	√	×	×	×	×	×	×	×	√
South Africa	×	√	**n.s.**	√	×	×	×	×	×	×	√	√
Spain	√	√	√	**n.s.**	×	√	×	√	×	×	√	√
Turkey	√	√	√	√	×	×	×	×	×	×	√	√

Compiled from2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD
n.s: .not specified

Appendix III

1. USA

Attributes	Brief Details
Eligible Industries and Qualifying Costs	• The incentive is intended to benefit all industries conducting qualified research. Consequently, all industries are eligible for the research credit. • Qualifying costs include: wages for in-house labor, 65% of contract research, and supplies used in the research process. • Costs incurred to construct a "pilot model" are qualified research expenses. • Expenses incurred for developing software that is primarily for internal-use can qualify for the research credit only if the software is highly innovative, which is an additional test to qualify for eligible R&D. The final regulations define software developed primarily for internal-use to include only software developed to perform general and administrative (G&A) functions. • Overhead and capital expenditure are excluded.
IP and jurisdictional restrictions	There is no restriction on the location of any resulting IP. Qualifying activities must be performed within the US and a US taxpayer must incur the related qualifying costs (although such costs may be reimbursed by a foreign affiliate).
Technology or innovation zones	There are no technology or innovation zones providing R&D incentives in the US.
Role of governmental bodies in administering incentives	The taxing authorities may audit research credits and deductions claimed by any taxpayer after the filing for the credit or deduction. Although there is no special audit or preapproval process required, there are special procedures, such as Pre-Filing Agreements (PFAs), available to taxpayers who wish to have their federal research credit and/or deduction audited in advance of filing their tax returns.
Administrative requirements	As with any credit or deduction, a taxpayer must maintain business records to support credits and deductions claimed. There are no special procedures for research credits or deductions. No preapproval process is required for the R&D incentives.
Statutory reference	• Federal research credit: Section 41 of the Internal Revenue Code • Federal R&D deduction: Section 174 of the Internal Revenue Code • State credits and deductions: various provisions based on each state's statutory framework
R&D Incentives	
1. Tax Incentives	
Tax Attribute	**Brief Details**
Current level of corporate Tax Rate	• Most states also impose an income tax at rates ranging from 4.6% to 12%. The average combined federal/state corporate tax rate is 39.1%
Research Tax Credit *under section 41 of the Internal Revenue Code (IRC)* *(Which became permanent at the end of*	• The research tax credit is a credit computed on an increment of qualified research spending exceeding a base amount. • Forty-five states offer a research tax credit that is similar to the federal tax credit, but generally at a lower credit rate. There are, however, a few states that offer refundable credits. Moreover, some states offer sales and use tax refunds or exemptions for property purchased to be used in the R&D process.

2015) 14-50%; Non refundable	• Eligible small businesses(companies with average annual gross receipts not exceeding USD 50M for the three preceding taxable years) can, for the first time, utilize research tax credits to offset alternative minimum taxes (AMT). • Qualified small businessescan utilize research credits to reduce payroll taxes. This new law applies to very small start-up companies that: (i) have gross receipts for the credit year of less than USD 5M (ii) have no gross receipts for any taxable year before the five taxable year period ending with the current taxable year, i.e., for the sixth year preceding the credit year and any years prior to the sixth year.
Traditional research tax credit **20%; non refundable** Credit on incremental spending with limitations	• The traditional credit is equal to 20% of the amount of the qualified research expenses (QREs) exceeding a base amount for the period 1984-88. • There is, however, a minimum base amount of 50% of the current year QREs, thereby limiting the incremental QREs to 50% of the determined amount. • This can be challenging considering that records dating back to the early 1980s are often not readily available. For this reason, and the complex base amount rules, very few companies elect to report the traditional research credit. • There is a minimum base amount applicable only to the traditional credit equal to 50% QREs.
Alternative Simplified Credit 14%; Non Refundable Credit on incremental Spending without Limitations	• The alternative simplified credit (ASC) is equal to 14% of the excess of the QREs over 50% of the average of the previous three years' QREs. • The ASC base amount is, therefore, much easier to determine than under the traditional method and most taxpayers elect the ASC. • There is no minimum base amount for the ASC. However, if there is no qualified research spending in any one of the previous three years, the credit is equal to 6% of qualified research spending in the current tax period.
Targeted research credits 20% (Basic Research); 20%(Energy Research Consortium) & 50% (Clinical Testing work) Non refundable	• There are other research credits under US law targeting specific types of research, including basic research credit (i.e., for funding research undertaken by universities and research organizations that have no commercial objective), energy research consortium, and a clinical testing relating to orphan drugs. • These additional credits cannot be taken on the same QREs included for the regular research credit.
Computational adjustments Non refundable Excess credits may be carried back 1 year and forward 20 years	• There are several computational adjustments that significantly reduce the true value of US R&D tax credits. While qualifying R&D expenses are currently deductible, taxpayers must reduce the current deduction by the amount of the tax credit (thereby reducing the net benefit of the traditional research tax credit and the ASC to 13% and 9.1%, respectively). • Alternatively, taxpayers may elect to forego the reduction to its current deduction and just report the traditional credit at 13% or the ASC at 9.1%. This election must be made annually on a timely filed original income tax return.
2. Government Funding Support	
Federal Grants	There are over 900 programs offered by the US federal government providing grants for: • developing commerce and business • improving food and nutrition, health, and environmental quality • improving, promoting, and assisting agriculture and agricultural activities • improving energy resources • training, employment, and labor management

	• development and/or implementation of science and technology
3. Investment	
Wind Production Tax Credit (PTC)	IRC section 45 provides a 10-year production tax credit of USD 02.3 per kw/hr for electricity produced from specified resources and sold to a third party. Specified resources include wind, biomass, landfill gas, waste to energy, and others.
Power Investment Tax Credit (ITC)	IRC section 48 provides a 30% investment tax credit for specified property used to produce electricity from renewable sources. These sources include solar, fuel cells, and combined heat/power systems (10% credit).

Source: Camp's 2014 legislation; 2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD

2. China

China offers a variety of tax incentives for R&D, including super deductions and reductions in the enterprise income tax rate.

Attributes	**Brief Details**
Eligible Industries and Qualifying Costs	Non Eligible Industries (Negative List) • Tobacco • Hospitality and catering • Wholesale and retail • Real estate • Rental and commercial services • Entertainment • Other industries to be specified by the Ministry of Finance and State Administration of Taxation Expenses eligible for the super deduction include: • Labor expenses (including labor costs for external personnel) • Direct expenses incurred in the R&D project • Depreciation expenses (even if the equipment is not used exclusively for R&D) • Amortization expenses • Design and testing expenses (including testing expenses for trial products) • Other directly related R&D expenses such as expert consultation, "high and new technology" R&D insurance, IP application costs, and travel and meeting costs. Eligible expenses in this category are limited to 10% of all eligible expenses for expenditure incurred on or after 1 January 2016 • Up to 80% of fees paid to contractors to perform research on the taxpayer's behalf qualify for the super deduction as long as the fee and related terms reflect an arm's length transaction • Expenses related to R&D activities carried out by contractors that are foreign organizations or individuals are not eligible for the super deduction. Activities not eligible for super deduction • Normal upgrades of products (services) • Direct application of research findings

	• Support activities following commercialization of a product • Duplication or simple alteration of existing products, services, technology, materials, or processes • Market research, efficiency studies, or management research • Quality control, testing, and analysis or repair and maintenance activities that are related to industrial (service) processes or are routine in nature • Research in the social sciences, the arts, or humanities • where an Chinese enterprise entrusts the R&D activities to overseas organizations or individuals, the incurred R&D expenses are not eligible for R&D super deduction.
IP and jurisdictional restrictions	• The IP must be held by the Chinese applicant • While less than 40% of the R&D expenses qualifying for the high-new technology enterprise (HNTE) incentive is allowed to be incurred outside China, the authorities may consider whether IP has been created and retained in China in granting HNTE status.
Technology or innovation zones	• There are many National Economic and Technological Development Zones (NETD Zones) in China, and various preferential treatments of financial subsidies are provided to companies established inside the NETD Zones. R&D incentives provided by each NETD Zone are diverse, according to the different development status and development policies of each NETD Zone. • R&D incentives are mainly provided by local authorities of NETD Zones by way of rewards or subsidies. The types of R&D incentives include land/office price reduction, one-off subsidy and financial subsidies to attract the R&D headquarters/center or technological companies, technology innovation project/ program financing, additional subsidies to the original R&D incentives, subsidies to the talents engaging in scientific and technological innovation, and rewards for the technology innovation honors.
Role of governmental bodies in administering incentives	• A preapproval or information registration is required to claim R&D tax benefits. Taxpayers need to submit all relevant information, including the R&D project budget, descriptions of specific R&D projects, categories of R&D expenditure, and management or board meeting documents authorizing R&D project(s), to the Government authorities as early as possible. • The incentives related to the R&D expenses super deduction should be claimed during the annual CIT filing, which is due within five months after the end of the tax year (the statutory annual filing deadline). The application package should be submitted with the relevant forms in the CIT filing return, which include the Basic Information Form on Taxpayers
Administrative requirements	• It is no longer necessary to obtain advance approval from the relevant tax authorities, i.e., taxpayers merely have to follow tax return filing procedures • Companies undertaking R&D projects at the provincial or ministerial level or above, or projects that span multiple years and that already have been verified, are not required to obtain annual verification by the competent science and technology authorities. • A company can apply for the super deduction retroactively, within three years after the expenses are incurred. • Companies are not required to set up special accounts for R&D expenses; however, in addition to complying with the standard accounting treatment under the prevailing financial accounting rules, companies must prepare supplementary financial records to accurately track the actual expenses that are eligible for the super deduction in the current year. • The tax authorities are required to intensify their administration of super deduction claims filed by taxpayers, through regular inspections and monitoring, with audits covering no less than 20% of all cases annually.

Statutory reference	• SAT, tax authorities at local levels and the science and technology authorities at city level or above for super deductions • The MOST, MOF and SAT are responsible for the guidance, management and supervision of the HNTE recognition procedures nationwide. • MOF, SAT, the Ministry of Commerce (MOC), MOST, and the National Reform and Development Commission (NRDC) for TASE • Regulations Effective year Incentives related to HNTE • Article 27, 28 and 30 of CIT Law 2007 • Article 90, 93 and 95 of Implementation Regulation of CIT Law 2007 • SAT Announcement [2013] No. 62 2013
R&D Incentives	
1. Tax Incentives	
The statutory Enterprise Income Tax (EIT) rate	25%
Super deduction 50%; 150% (pwc report) Non-refundable; Deduction on volume & can be carried forward for 5 years	• A super deduction provides an extra 50% deduction for eligible R&D expenses. Tax losses attributable to R&D super deductions may be carried forward up to five years.
VAT/Custom duty incentives Non-refundable	• An exemption from VAT (with input VAT refundable) is available for providing R&D, offshore outsourcing services, or transferring technologies to foreign entities. • An exemption (with input VAT not creditable or refundable) also is provided for technology transfers or R&D services (including relevant consulting services) between domestic parties. • Qualified foreign-invested R&D centers may be eligible for an exemption from import duty, VAT, and consumption tax on the import of equipment, devices, and instruments through 31 December 2018. • Qualified private non-enterprise technology institutions may be eligible for an exemption from import duty, VAT, and consumption tax on the import of items for scientific R&D use.
2. Funding Support	
Local Financial Subsidies	Granted by local governments to support R&D activities upon approval
3. Patent Box	
Technology/Software Companies	• The first CNY 5M of annual income from qualified technology transfers (including income from a non-exclusive license with a license term of no less than five years) is exempt from EIT. • Annual income from qualified technology transfers (including income from a non-exclusive license with a license term of no less than five years) in excess of CNY 5M is taxed at 50% of the normal EIT rate. • Newly established software companies often are granted tax holidays.

	• Taxable software companies may be granted VAT preferential treatment on qualified revenue. • Qualified software companies may be eligible for an exemption from import duties on self-used equipment and materials. Reduced tax rates are offered to companies developing new technologies, products, etc.
Income on Technology Transfer	Scope of qualified technology transfer: • Transfer of patent technology • Transfer of computer software copyright • Transfer of right of integrated circuits layout designs • Transfer of new species of plant • Transfer of biopharmaceutical products • Transfer of other technology authorized by the MOF and SAT
4. Investments	
Reduced tax rates for High-New Technology Enterprise (HNTE)	• A reduced 15% EIT rate is available for companies granted HNTE status. HNTE status is granted for a three-year term, with an annual review of the status during the three-year period. HNTEs normally are eligible for a 50% super deduction for qualified R&D expenses, in addition to the reduced EIT rate.
Reduced tax rates for Technology Advanced Service Enterprises (TASE)	• The reduced 15% EIT rate also applies to TASE that are located in 21 designated cities. This incentive has been extended through 31 December 2018. TASE status is obtained by submitting an application and will be reviewed each year. TASEs generally are not granted the 50% super deduction for qualified R&D expenses, in addition to the reduced EIT rate.
Promote Foreign Investment	• The local governments are authorized to support investment projects that make a substantial contribution to local employment, economic development, and technological innovation to lower the cost of the investment and operation of foreign enterprises. • Most incentives offered by local governments are based on negotiation on a case-by-case basis. Incentives commonly include tax refunds, tax credits, free leasing of office spaces, etc.
Preferential Tax Incentives	• Support different kinds of production and the use of energy-saving technologies and products. For example, investment in designated energy-saving equipment and facilities is entitled to an EIT credit equal to 10% of the total investment.

Source: 2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD

3. **Japan**

Attributes	**Brief Details**
Eligible Industries and Qualifying Costs	• Research credits are not limited to specific industries, although the activity must be technological and scientific in nature. • The expenses must be incurred by the Japanese entity. Research expenses that are funded by unrelated entities (government agencies, customers, suppliers, etc.) are not eligible for the research credit. • To qualify for the credit, the expenses must be incurred to manufacture products or to improve, design, formulate, or invent techniques. Qualifying expenditure includes • In-house labor costs & supplies

	• Overhead • Depreciation on fixed assets • Contract costs.
IP and jurisdictional restrictions	• Japanese law does not expressly require that companies claiming research tax incentives own the IP created through their R&D activities. • The qualifying costs incurred by a Japanese company are eligible for the research credit even if the research is conducted outside of Japan.
Technology or innovation zones	There are no technology or innovation zones providing R&D incentives in Japan.
Role of governmental bodies in administering incentives	The National Tax Agency administers the R&D tax credit (i.e., eligibility for the tax credit is scrutinized by tax authorities upon future tax audits).
Administrative requirements	• No prior approvals from government/regulatory agencies are required. Credit should be claimed on the tax return for the relevant period. Claims on amended tax returns generally are accepted in cases of a change to the tax credit limitation amount. • The R&D tax credit is available to "blue return" filers. Blue form tax return status is obtained by submitting an application to the appropriate tax office. Record-keeping substantiation requirements apply. • To claim a tax credit, certain forms (schedule 6(6), 6(7), 6(8) and/or 6(9)) must be attached to the corporate tax returns, which are due two months after fiscal year-end (a one-month extension is generally allowed).
Statutory reference	• Article 42-4 of the Special Taxation Measures Law
R&D Incentives	
1. Tax Incentive	
General National Corporate Income Tax Rate	Corporate income tax rate in Japan is 23.4% for fiscal periods beginning on or after 1 April 2016 and this tax rate will be reduced to 23.2% for fiscal periods beginning on or after 1 April 2018.
Volume-Based Tax Credit Non refundable; Unused tax credits may not be carried forward.	• The tax credit for general R&D costs is a volume-based credit and varies depending on whether the company claiming the credit is a SME or a large company.
a. Small and Medium Sized Entities (SMEs) 12%	• SMEs may claim a tax credit equal to 12% of total R&D expenditure. The tax credit cannot exceed, however, 25% of the corporation tax liability before the credit is applied.
b. Large companies 8-10%	• The tax credit for large companies is 8% to 10% of total R&D expenditure. The tax credit cannot exceed, however, 25% of the corporation tax liability before the credit is applied.
c. Tax credit for special R&D costs 30%	• A 30% credit is provided for joint R&D with a university or public research institution or where the R&D is contracted to such entities. • This provision is applicable to "blue" tax return filers, which includes both SMEs and large companies. • Royalty payments made to SMEs also qualify for this special tax credit. The credit is 20% where the R&D is with other non-public entities

Incremental tax credits Capped at 30%	• Additional incremental tax credits (for both SMEs and large companies) also are available. • Where the current period R&D expenditure exceeds: (i) An amount 5% greater than the annual average of the R&D expenditure for the three preceding fiscal years (ii) The highest annual R&D expenditure for the previous two fiscal years, the company may claim a credit for a percentage of the increase in R&D expenditure, where the percentage applied is equivalent to the percentage increase in R&D expenditure
Tax Reform 2017	
2017 Tax Reform: Revision of the R&D Credit Regime	The proposals, which are subject to amendment, are expected to be finalized and enacted into law by 31 March 2017, and will impact the following incentives.
a. Volume-based tax credit	• The tax credit for SMEs will be increased up to 17% of total R&D expenditure, under a two-year transitional measure, where the R&D cost is increased by more than 5%. • The tax credit for large companies will be changed from 8%-10% to 6%-10% of total R&D expenditure. The upper limit, however, may be increased to 14% under a two-year transitional measure.
b. Credit limitations	• The credit limitation generally still will be 25% of the corporate tax liability. • However, where the incremental tax credit is not taken, the volume-based tax credit limitation may be increased as follows: if R&D costs for an SME is increased by over 5%, the cap will be increased by 10% (i.e., to 35% of the corporate tax liability); and if R&D costs for large companies exceed 10% of average sales, the cap may be increased by 0% to 10% (i.e., up to 35% of the corporate tax liability).
c. Incremental tax credits	• The basic calculation method will be abolished, but the alternative calculation method will be extended for two years.
d. Expanded scope of R&D costs eligible for tax credit	• The scope of R&D costs eligible for the tax credit will be expanded to include costs for service development in relation to the "fourth industrial revolution" (businesses using IT, big data, artificial intelligence, etc.)
2. Funding Support	
R&D grants	• Japan offers many different grants for R&D across a wide range of fields. For example, the Small Business Innovation Research "SBIR" program encompasses cash grants from various government ministries
3. Investments	
CAPEX—Special depreciation/tax credit for revitalization of local economies (42-11-2)	• Tax incentives are available to encourage the revitalization of regional economies through the relocation of head office functions from large cities to local regions, and the expansion of head office functions at existing regional facilities. • Special depreciation of 25% of the acquisition cost of buildings may be available in the case of relocation, and 15% in the case of expansion. • Alternatively, a tax credit (capped at 20% of the corporation tax liability) may be taken for 7% of the acquisition costs in the case of relocation, and 4% of the acquisition costs in the case of expansion.

CAPEX—Special depreciation/tax credit in national strategic special zones (42-10)	• Special depreciation or a tax credit may be available for the acquisition cost of eligible assets in designated national strategic special zones. • Special depreciation depends on the type of asset acquired: 25% for buildings and structures, and 50% for machinery and R&D equipment/fixtures used in specified businesses within the zones that are conducive to international competitiveness or the formation of hubs for international business. • Alternatively, a tax credit (capped at 20% of the corporation tax liability) may be taken for 8% of the acquisition costs of buildings and structures; and 15% for the costs of machinery and R&D equipment/fixtures used in specified businesses.

Source: 2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD

4. Germany

Attributes	**Brief Details**
Eligible Industries and Qualifying Costs	Eligibility is not limited to particular industries. Companies in the following industries typically seek cash grants: • Manufacturing and production processes • Automotive and transportation • Biotech and life sciences • ICT • Energy and utilities Qualifying expenditure includes: • Personnel Costs • Materials • Overhead • Subcontracting • Amortization • Travel Costs Qualifying activities include the following: • Industrial research: Research with a specific practical objective aimed at developing new products, processes, or services, or at improving existing ones. • Experimental development and demonstration actions: Demonstration of new applications and/or research results. • Development of business models: Analysis and implementation of innovative (digital) business models. The selection criteria for eligible projects include: • Extent of innovation level • Extent of technical risk • Exploitation plan • Positive environmental effects.
IP and jurisdictional restrictions	R&D activities must be conducted in Germany and R&D costs shall incur in Germany. The exploitation of project results regularly will have to take place in Germany/EU, with the IP created through the research (initially) remaining in Germany/EU. Nevertheless, large multinational companies with IP relocated to

	headquarters outside Germany also may qualify for funding under certain conditions.
Technology or innovation zones	• There are no technology or innovation zones providing R&D tax incentives in Germany. However, Germany supports the creation of innovation clusters in certain areas. • Innovation clusters consist usually of different partners from academia and industrial stakeholders. Funding up to €5 million can be provided to the cluster by regional governments for a duration of up to 10 years. • Additionally, the creation of new R&D centers (or production premises) can be funded in specific regions in Germany.
Role of governmental bodies in administering incentives	• Funded R&D and investment projects may commence only after the cash grant has been approved for a beneficiary. Cash grants are disbursed after costs have been incurred and claimed with the funding body. Costs incurred prior to approval (e.g., before the project started) do not qualify as eligible costs.
Administrative requirements	• Public incentives for companies with a legal entity in Germany are provided by the EU, the German federal government, and the individual federal states.
Statutory reference	• EU legislation • Communication from the Commission – Framework for State Aid for Research and Development and Innovation (2014/C 198/01) • Commission Regulation (EC) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Art. 107 and 108 of the Treaty (General Block Exemption Regulation) • Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (2003/361/EC) • German legislation • National level General Conditions of the Federal Ministry of Research and Education for the Allocation of Benefits for R&D Activities to Commercial Companies on a Cost Basis as of April 2006 • National funding guidelines for investments and innovation clusters
R&D Incentives	
1. Tax Incentive Germany is one of the few countries that does not offer tax incentives for R&D activities. Although there is a political debate about the implementation of tax incentives, quick adoption is not expected in the short-to mid-term.	
2. Funding Support	
Federal R&D grants- Cash grants	• Cash grants for R&D are awarded up to 50% of qualified research expenses • Application-based, non-repayable cash grants for R&D projects and demonstration projects. • The average grant rate for R&D projects is 35%-45% of eligible project costs although higher rates may be available for SMEs.
Targeted R&D grants	a. Energy: This federal program focuses on R&D activities that increase energy efficiency in the following areas: industrial production, buildings, cities, power supply and storage, or renewable energy.

	b. Digitization and automation of production processes: This innovation area has received considerable attention, with three major framework programs: • Innovation for the production, services and work of tomorrow • Convergent ICT • Human-Machine Interaction c. New vehicle technologies This program offered by the Federal Ministry for Economic Affairs focuses on research on technologies for future vehicles d. Innovations for hydrogen and fuel cells This program supports industrial research and experimental development in the following sectors: transport, including hydrogen infrastructure; hydrogen production; industrial applications; and special markets for fuel cells. e. SME innovative The SME programs focus on SME-driven R&D projects in areas such as bio- and nano-technology, production processes, and medical technology. For SMEs, cash grants are awarded up to 60%. f. Health The two framework programs, 'Health research' and 'Medical technology' support basic R&D projects on diseases and preventive measures, as well as the development of innovative medical technologies. g. Microelectronics The framework program supports R&D projects in all types of microelectronic applications (e.g., mobility, energy, industry 4.0). h. Shipping technologies The two funding programs, 'Innovative Port Technologies' and 'Maritime technologies of the next generation' provide funding for innovations in the context of waterway transportation. For large enterprises, cash grants are awarded of up to 50% of eligible costs, with a 10% bonus possible for SMEs, depending on the specific calls.
Horizon 2020	• Enterprises located in Germany can apply for R&D grants under several EU programs. However, stiff competition for EU funding, especially in the current funding program Horizon 2020
3. Investments	
Investment Incentives	• Investment incentives are available for initial investments • There are investment grants available for initial investments within a privileged region for taxpayers setting up a new plant/business premises or undertaking new activities that lead to a diversification of the assets of an establishment.
Targeted Investment grants-a. GRW program	• Set-up of business premises and runs until 2020, and supports companies in setting up new plant or business premises in specific structurally weaker regions (mainly in Eastern Germany). • Maximum funding quotas range from 20% for large companies to 40% for SMEs
Targeted Investment	• additional investment costs for eco-friendly innovative investments can be

grants-b. Environment innovation program	funded with non-repayable cash grants or interest-reduced loans. • Cash grants are awarded up of to 30% of eligible costs or interest-reduced loans of up to 70% of eligible costs.
Targeted Investment grants-c. Acquisition of electric vehicles and charging infrastructure	• funding is available for private investors, cities and municipalities for building a nationwide loading charging infrastructure for electrical vehicles with 15,000 load stations.

Source: 2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD

5. South Korea

Attributes	**Brief Details**
Eligible Industries and Qualifying Costs	• Dedicated R&D center of the corporation or the corporation's internal R&D department, both of which should be registered with the Government (i.e., Ministry of Science, Information & Communication Technology and Future Planning in Korea). Eligible expenses include • cost of machinery, facilities, tools, office machines, telecommunications instruments, testing machines, optical instruments, etc. used to carry out the R&D activities. Ineligible expenditures include: • General management and supporting activities • Market research and promotional activities or general quality testing • Repetitive information-gathering activities • Activities to improve management or staff efficiency • Legal and administrative activities such as protection of patent rights, etc. • Exploration and investigation activities related to reserves of natural resources including minerals • Research activities on contract basis Qualified R&D costs include: • Labor costs (salaries, wages, bonuses, etc.) • Materials costs (samples, parts, and raw materials used in the conduct of R&D) • Rent for R&D equipment • Commissions paid to the qualifying body • Training costs • Other costs (trademark development costs, design development costs, consulting fees, and quality guarantee costs). However, R&D subsidized by the government is not eligible for R&D tax credit.
IP and jurisdictional restrictions	• All R&D expenditure directly related to the R&D activities of the company may be claimed in the tax credit computation, regardless of where the R&D activities are carried out, except for research subcontracted to academic institutions; which must be located in South Korea. • Any resulting IP does not have to be held by the South Korean company.
Technology or innovation zones	• If qualified, the companies located within an R&D Special Zone are able to enjoy certain tax exemptions.

Role of governmental bodies in administering incentives	• Each year, the Korean National Tax Service reviews R&D tax incentive applications that have been submitted with a CIT return and processes the R&D tax credit claims. • The R&D tax credit claims may also be subject to written information requests or a tax audit in the future.
Administrative requirements	• According to the Basic Research Promotion and Technology Development Support Act, a dedicated R&D center or R&D department set up by a company should be registered with the Ministry of Science, Information & Communication Technology and Future Planning in order to benefit from R&D tax incentives.
Statutory reference	• The Tax Incentives Limitation Law (TILL) • Tax credit for R&D expenditures- Article 10 of the TILL • Tax credit for investment in R&D facilities-Article 11 of the
R&D Incentives	
1. Tax Incentive	
Corporate Tax Rate in South Korea	Ranges from 11% to 24.2% depending on the taxpayer's tax base
Tax Credit Non refundable; Unused R&D credits may be carried forward to the following five years.	Credit on either incremental or volume. However, the incremental method cannot be used in case of either (i) no R&D expense has been incurred during the previous four years or (ii) the R&D expenses of last year are less than the average of the previous four years.
a. SMEs For start up SMEs it can be carry forwarded for 10 years	• A tax credit equal to the greater of 50% of the current year R&D expenditure exceeding the average R&D expenditure for the previous four years; or 25% of the current year R&D expenditure. • A 30% tax credit computed based on current R&D expenditure related to the New Growth Engine Industry or Original Source Technology program designated by the government authority. • A tax credit equal to 10% of the purchase price of certain IP purchased by an SME from a Korean party.
b. Medium Sized Companies	• Medium-sized companies are entitled to a tax credit that is the greater of 40% of the current year's R&D expenditure exceeding the average R&D expenditure for the previous four years or 8% of the current year R&D expenditure.
c. Large Sized Companies	• Large companies are entitled to a tax credit that is the greater of 30% of the current year R&D expenditure exceeding the average R&D expenditure for the previous four years, 1%, plus an "additional rate" capped at 3% of the current year R&D expenditure. • The additional rate is 50% of the R&D expense ratio (i.e., current R&D expense divided by sales revenue).
Additional R&D tax incentives 30%; Non-refundable; Unused R&D credits may	An additional R&D tax credit is computed on qualified expenditure related to New growth engine industry

be carried forward to the following five years.	
a. **Investment tax credit for R&D equipment**	• The investment tax credit for R&D equipment is 1% of the investment in equipment used in R&D for large companies, 3% for medium-sized companies and 6% for SMEs.
b. **Tax credit for investing in facilities for energy-saving**	• The TILL provides an investment tax credit (1% for large companies, 3% for medium-sized companies, and 6% for SMEs) for the purchase of new qualifying facilities or equipment to achieve energy savings.
c. **Tax credit for investing in facilities for environmental protection**	The TILL provides an investment tax credit (3% for large companies, 5% for medium-sized companies, and 10% for SMEs) for the purchase of new qualified facilities or equipment for environmental protection, such as an air pollution prevention facility, waste water reprocessing facilities, a soil pollution prevention facility, etc.
d. **Tax incentive for foreign-invested companies**	• Foreign-invested companies that engage in certain qualified high technology businesses can apply for a five-year exemption from corporate income tax, individual income tax, acquisition tax, and property tax. • The exemption begins from the first year of profitable operations (and from the fifth year, if not there are no profits until that time). • The full exemption is followed by a two-year 50% exemption in proportion to the foreign shareholding ratio. There is a limit for the tax exemption that varies depending on the types of tax holidays
2. Patent incentives	
Patent Box	• A patent box also is available to SMEs. If a SME transfers or leases IP it developed to a Korean party, the SME is entitled to a tax exemption in the amount of 50% of the corporate income tax on capital gains arising from the transfer or 25% of the corporate income tax on rental income. • In cases where SMEs acquire a patent from a tax resident, the SME can claim 7% of the amount paid to acquire the patent. • In cases where SMEs lend a qualified patent, 25% of the related income from such lending is exempt from tax.

Source: 2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD

6. Singapore

Attributes	**Brief Details**
Eligible Industries and Qualifying Costs	Research tax incentives are available to all industries Eligible expenses include • wages and salaries • materials • utilities incurred directly for R&D activity Capital expenditure on plant, machinery, land, or buildings, or on alterations,

	additions, or extensions to buildings, or in the acquisition of rights arising in or arising out of R&D are specifically excluded. Non eligible activities: • Quality control or routine testing of materials, devices, or products • Research in the social sciences or the humanities • Routine data collection • Efficiency surveys or management studies • Market research or sales promotion • Routine modifications or changes to materials, devices, products, processes, or production methods • Cosmetic modifications or stylist changes to materials, devices, products, processes, or production methods
IP and jurisdictional restrictions	• Only R&D activities undertaken in Singapore qualify for the section 14DA(1) additional 50% deduction. As long as the R&D is performed in Singapore, the R&D expenditure need not be related to the entity's existing trade or business. • With respect to the Section 14D base and Section 14DA(2) PIC enhanced deductions, R&D may take place outside of Singapore but must relate to taxpayer's existing trade or business. • If R&D payments are made by a Singapore entity to a R&D organization for R&D performed outside Singapore, a claim for deduction may be allowed to such entity provided the R&D expenditure is related to the entity's existing trade or business and any benefit attributable to R&D accrues to the Singapore entity itself. • For Section 14E further deduction and the RISC/IDS grants, the R&D project must be carried out in Singapore and must receive special approval from the Minister (advance application with the Singapore Economic Development Board is required).
Technology or innovation zones	There are no technology or innovation zones providing R&D incentives in Singapore.
Role of governmental bodies in administering incentives	• The expenditure claimed is processed by the Singapore tax authorities, i.e., the Inland Revenue Authority of Singapore (IRAS), for the enhanced R&D deduction. The IRAS also monitors the activities that are claimed to ensure compliance with the R&D enhanced tax deduction regime. • The Singapore Economic Development Board (EDB) administers discretionary incentives, including cash grants and the 200% tax deduction.
Administrative requirements	• No prior approval is required to claim tax deductions under Sections 14D, 14DA(1), and 14DA(2) Companies are not required to seek Government preapproval for the enhanced R&D tax deduction. For the other discretionary tax incentives, approval must be granted by the EDB. • To be eligible for the enhanced tax deduction, a company must submit the claim in its income tax return and tax computation with the completed R&D claim form, by the annual filing deadline of 30 November. • For the R&D cash grant, companies must submit documentation in relation to making claims and reporting on the progress of the project. Claims may be made on a quarterly basis using the prescribed format as provided by the relevant authority once the R&D cash grant has been awarded. Companies are also required to submit a yearly progress report and a final report at the end of the project.

	• For the double tax deduction for R&D expenses, companies must, in the first year of assessment when a new tax incentive commences, complete and submit with their income tax return, the Evaluation Checklist for a Company Awarded with Tax Incentives(s) form
Statutory reference	Income Tax Act, Section 14D, Section 14DA, Section 14E and Section 15
R&D Incentives	
1. Tax Incentives	
Corporate Tax Rate	The headline corporate tax rate is 17% with a partial tax exemption granted for the first SGD 300K of taxable income.
Productivity and Innovation Credit (PIC) Scheme 400% When R&D expenses exceed taxable income, the excess may be carried forward and set off against future taxable profits	• This scheme offers a super deduction of up to 400% of qualifying expenditure on qualifying R&D activities conducted both in and outside Singapore so long as it can be demonstrated that the benefits of the R&D activities effectively accrued to the Singapore entity. • However, this scheme is set to expire in 2017 • R&D activities in Singapore should continue to enjoy up to a 150% or 200% tax deduction if certain conditions are satisfied or approval is granted.
Section 14D—100% base deduction When R&D expenses exceed taxable income, the excess may be carried forward and set off against future taxable profits **Section 14DA(1)—50% additional deduction**	• Section 14D provides an exception to the general rule that R&D costs are capital in nature and, hence, not currently tax deductible. • This section allows current deductions for R&D expenditure incurred by a taxpayer in the conduct of its trade or business (including payments made to R&D organizations and payments made under and R&D cost sharing agreement). • In addition to qualifying for the Section 14D base deduction, expenditure incurred with respect to R&D conducted in Singapore during tax years from 2009 to 2025 may qualify for an additional deduction of 50% of qualifying expenditure. • Expenditure incurred on R&D performed outside Singapore does not qualify for the additional deduction of 50%.
Section 14E additional deduction	• This provision allows an additional super deduction for R&D projects carried out in Singapore and approved by the Economic Development Board (EDB) before 31 March 2020. • Does not apply to expenditure for which the enhanced deduction under the PIC has been allowed.
Double tax deduction for R&D expenses	• The incentive provides a 200% tax deduction on R&D expenditure incurred on approved projects. Under the current law, no R&D projects may be approved for this incentive after 31 March 2020. Unused losses can be carried forward

Can be carried forward	indefinitely and are subject to the satisfaction of the shareholding test. Taxpayers are required to seek Government preapproval in order to obtain the incentive. • The double tax deduction for R&D expenses is applicable to future investments and, typically, approval is granted only on projects that have not yet commenced.
Pioneer Tax Incentive 5-10%	• Offers a tax holiday, development and expansion incentives that can offer a 5% or 10% preferential tax rate, together with a HQ status award, investment allowance that can be used to support projects with high CAPEX, and a global trader program that seeks to promote international trading in Singapore.
Development and Expansion Incentive (DEI) and HQ awards 5-10%	• Provides a preferential tax rate of 5% or 10% on qualifying income derived from qualifying activities and the support level depends largely on the investment plan. • The initial tax incentive period is generally from 5 to 10 years. The incentive can be renewed with additional business commitments required. The total incentive period can be up to 20 years and for very strategic project, it can be supported up to 40 years.
Approved royalties incentive	• Provides reduced or no withholding tax on royalty payments to access advanced technology and know-how.
As announced in the 2016 Singapore budget, the 400% enhanced R&D deduction and cash payout option will be allowed to expire after year of assessment 2018. Furthermore, the cash payout rate of R&D expenditure incurred from 1 August 2016 has been lowered from 60% to 40%, capped at S$100,000 qualifying expenditure per year of assessment. However, the 50% enhanced deduction (along with the 100% base deduction) for R&D activities conducted in Singapore will remain in effect up until year of assessment 2025.	
2. Funding support	
grant schemes: **Research Incentive Scheme for Companies (RISC)/Innovation Development Scheme (IDS)**	• The RISC is a Government cash grant co-fund to encourage and assist companies in setting up R&D centers in Singapore and developing their in-house R&D capabilities. • The grants have been provided selectively to large projects in certain strategic technology areas identified by the Singapore Government. • Projects awarded the cash grant are not announced nor made public. • The support level generally can be up to 30% of total project costs, with higher support for certain costs. Supportable project costs include expenditure in the following: • Manpower cost (30% to 50% support) • Equipment, materials, consumables, and software (30% support) • Singapore-based professional services (30% to 50% support) • Intellectual property rights, e.g., licensing, royalties, technology acquisition (30% support). Application for the grant is reviewed on a project basis and awarded by the Economic Development Board (EDB).
3. Patent incentives	
BEPS-compliant patent box regime: IP Development Incentive (IDI)	• The IDI would incentivize income generated from the exploitation of IP arising from R&D activities carried out by a taxpayer in Singapore or outsourced to third parties.

	• "IP income" for purposes of the IDI would encompass royalties from the licensing of IP and would also likely cover embedded royalties in the profit derived by a supply chain principal.
4. Investment	
Investment allowance	• Provides additional allowance (tax depreciation) on a percentage (can be from 30 to 100%) of approved fixed capital expenditure. This is in additional to the base allowance of 100%.

Source: 2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD

7. U.K.

Attributes	Brief Details
Eligible Industries and Qualifying Costs	Companies may claim the incentive for their expenditure on the following cost categories: • Staff costs for employees who are directly and actively engaged in carrying out R&D. • Contracted individuals working under the supervision, direction, or control of the company where their services are provided through a third-party staff provider. The costs are limited to 65% of the payments where the staff provider is unconnected and to the underlying staff costs where the staff provider is a connected entity. • SMEs can claim 65% of R&D-related subcontracting costs. Large companies can claim subcontracting costs only if they are paid to a university, health authority, charity, scientific research organization, individual, or a partnership of individuals. • Software or consumable items used in the R&D process may not be included in an R&D claim where the consumables form part of a product that is sold or otherwise transferred in the ordinary course of business. • Payments to volunteers for participating in clinical trials. Expenditure on rent, land, patents, and patent protection are not included.
IP and jurisdictional restrictions	There is no specific jurisdictional requirement on the location of intellectual property.
Technology or innovation zones	There are no technology or innovation zones providing R&D incentives in the US.
Role of governmental bodies in administering incentives	The taxing authorities may audit research credits and deductions claimed by any taxpayer after the filing for the credit or deduction. Although there is no special audit or preapproval process required, there are special procedures, such as Pre-Filing Agreements (PFAs), available to taxpayers who wish to have their federal research credit and/or deduction audited in advance of filing their tax returns.
Administrative requirements	As with any credit or deduction, a taxpayer must maintain business records to support credits and deductions claimed. There are no special procedures for research credits or deductions. No preapproval process is required for the R&D incentives.
Statutory reference	• Federal research credit: Section 41 of the Internal Revenue Code • Federal R&D deduction: Section 174 of the Internal Revenue Code • State credits and deductions: various provisions based on each state's statutory framework

R&D Incentives	
1. Tax Incentives	
The Corporate Tax Rate 20% (reduced to 19%)	Corporate tax rate is 19%
Volume-Based Super Deductions	The UK offers volume-based super deductions and credits for qualifying revenue expenditure that vary depending on the size of the taxpayer: (i) a super deduction scheme is available for companies that fall within the definition of a SME (ii) all other companies (large companies) can claim an R&D expenditure credit (RDEC) or, until 31 March 2016, a super deduction. SMEs qualify for the following expenditure-based tax incentives: • 230% super deduction (225% for revenue expenditure incurred before 1 April 2015) • Cash credits for SMEs in loss positions, up to 33.35% of qualifying expenditure (32.63% before 1 April 2015). • A cap restricts the amount of the tax benefit available to SMEs, over and above the benefit that would have been available had the company not been a SME, to EUR 7.5M per R&D project. Large companies qualify for the following expenditure-based tax incentives: • Until 31 March 2016, a 130% super deduction was available on qualifying revenue expenditure; • As from 1 April 2016, the RDEC is the only regime available for large companies and, where an accounting period straddles 1 April 2016, only the RDEC can be claimed. The RDEC currently is 11%. • The RDEC is accounted for as an "above the line" "grant" or "other" income and, therefore, is taxable. • The RDEC regime is based on the same qualifying cost categories (see below) and is more generous than the super deduction. Companies without a corporation tax liability against which the RDEC can be offset can claim a cash credit. The cash credit, however, is capped at an amount equal to the payroll taxes and social security costs associated with the employees whose costs are included in the claim. • Unused RDEC benefits may be carried forward to utilize in future periods or may be surrendered to group companies with a UK corporation tax liability in the same accounting period. • For both the SME and RDEC regimes, the cash credit is available only if the most recent financial statements of the claimant company have been prepared on a going concern basis. There is a higher rate of corporation tax for companies that earn profits from oil extraction or oil rights in the UK or UK continental shelf. The rate currently is 50%, but such companies also are able to claim a higher rate of the RDEC at 49%, resulting in a net after-tax benefit of 24.5%.
Renewable generation support	Innovative and environmentally friendly generation technologies may be eligible for support in the form of cash incentives from regulated energy utilities. In practice, this support usually is in the form of tariff payments made to the generator for each

	megawatt of qualifying renewable energy generated. A higher value tariff usually is paid for energy that is surplus to the generator's own needs.
Small scale renewable generation support	This incentive supports small scale renewable energy installations up to 5MW in size producing their own electricity. Generators are paid a tariff for the electricity units produced through qualifying generation assets (e.g., solar, wind, and hydro). The tariff varies depending on varying factors and is paid from energy suppliers.
Large-scale renewable generation support (renewables obligation)	Several tradeable certificates are available to large-scale renewable generation assets, such as "renewable obligation certificates" (ROCs) and "renewable guarantees of origin" (REGOs). Traded commercially, the value of these certificates is subject to market forces. In the case of ROCs, an annual "true-up" of the scheme usually leads to additional cash payments to participating generators.
Resources taxes recycled into local communities (funding for environmental projects and funding projects to reduce impact of extraction industry)	Environmentally driven research and smaller provincial projects can be supported by "grants" funded from certain resource taxes (Landfill Tax, Aggregates Levy).
2. Funding Support	
R&D Grants	**R&D grant (EU)** There is an extensive program of calls provided by the EU. Some permit a company to apply directly, while many require collaboration with three or more partners from three or more EU member states. EU schemes may offer a high level of assistance, but projects need to be more research-oriented and the application process is longer than that for a national R&D grant. **R&D grant (national)** Assistance can be available in response to a specific call or based on a direct application. The assistance level will depend on the nature of the work packages and whether they qualify as industrial research or experimental development. If a SME also benefits from R&D tax incentives, the company must consider that the award of the grant may reduce otherwise qualified R&D expenditure, or, if the grant constitutes state aid, exclude the whole project from the SME tax
3. Patent Incentives	
Patent box	A patent box regime introduced for profits earned on or after 1 April 2013 from patented inventions and certain other innovations enables companies to apply a lower rate of corporation tax. The relief has been phased in and effectively applies a 10% rate of corporation tax to profits generated from qualifying patents. The "new" regime requires claimant companies to track their R&D expenses and how they relate to specific patents, products, or product families, creating a much stronger link between the R&D tax relief and the patent box regime.
4. Investments	
CAPEX	This scheme encourages investment by private sector companies in medium term (three to five-year) investment plans that involve capital expenditure and the creation of net new jobs and/or the safeguarding of jobs that otherwise may be lost. For

	service sector projects, the grant may be influenced by the salary costs of net new jobs to be created. In all cases, a need for assistance must be demonstrated.

Source: *2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD*

8. France

Attributes	**Brief Details**
Eligible Industries and Qualifying Costs	There is no restriction on the types of entities that may qualify for incentives. Qualified activities include basic research, applied research, and development activities. To qualify, R&D activities must: • Present a significant technological, technical, or scientific advancement when compared to the current state of the art • Be associated with scientific/technological uncertainties and be uncertain with regard to the anticipated outcome • Require the use of scientific methods and/or an experimental approach. Eligible expenses generally include the following: • R&D staff expenses • General and administrative (G&A) expenses • Depreciation allowances for assets used for R&D activities in France • Patent costs • Contract research costs • Costs of technological monitoring Materials used in the research process do not qualify. The law also allows an estimate of G&A expenses. The formula for estimated G&A expenses is 50% of all R&D staff expenses and 75% of the depreciation allowance of assets used in R&D activities in France (including research equipment and facilities). The following limits apply to the amount of qualifying contract research expenses: • There is a cap on private subcontracted expenses equal to three times all other qualifying expenses, but in no event can the subcontracted R&D fees exceed EUR 12M • Qualifying contract research is limited to EUR 2M where the taxpayer and the subcontractor are related entities. • Contractors performing research on a time/materials basis can claim tax credits for their qualified research expenses because there is no “at-risk” rule under French law. • Cash grants reduce the R&D tax credit base.
IP and jurisdictional restrictions	For jurisdictional requirements, please refer to the eligibility requirements specified for each incentive.

Technology or innovation zones	There are 71 “innovation clusters” in France that are spread across the country and have been bringing together teachers, researchers and industry stakeholders to develop collaborative R&D projects — in all key technology sectors — that are eligible for state and local aid (€2 billion granted over three years through direct financial aid and tax exemptions). Based on the most recent data available, nearly 7,000 companies, including 500 foreign companies, now belong to a cluster in France.
Role of governmental bodies in administering incentives	• The R&D tax credit is managed by the French tax authorities and the French Ministry of Higher Education and Research. • No preapproval is required. An advance ruling process is available to determine eligibility for tax credits; however, it is time consuming, and taxpayers do not always receive responses during the process. As such, most taxpayers file for tax credits rather than going through the advance ruling process. • There is an automatic tax audit if a tax credit exceeds €1 million. If the credit amount exceeds this amount, the tax audit tends to be significantly scrutinized (e.g., providing supporting documentation for every project). • Tests on controls (by Government) are conducted on an average of 10% to 20% of the overall projects qualifying for the incentives, and taxpayers are advised to take consistent approaches in preparing documentation. • Documentation must be prepared in the French language. • The R&D tax credit rate has been increased from 10% to 30% since 2007.
Administrative requirements	• Detailed documentation is required for control purposes and should include detailed factual information (e.g., objective of projects, costs and calculation of the credits). The documentation also requires support on eligibility of the activity and R&D tax incentives related to the activity. This documentation has to be provided to the French tax authorities upon request, within the course of a tax audit. The company should file Form 2069 A each year with its tax return. • The requested forms (1447-M-SD/1447-C-SD and 1465-SD) should be filed with the relevant corporate tax offices within the aforementioned deadlines. The forms have to be completed as if the company did not benefit from a relief. • Therefore, all the information required by the French tax authorities to assess the territorial economic contribution should be mentioned in the forms (e.g., address, nature, size of the premise, number of employees).
Statutory reference	• R&D tax credit: Section 244 quarter B of the French Tax Code • Innovative New Company status: Section 44 sexies — 0 A of the French Tax Code • Reduced CIT treatment of revenues derived from patents: Section 39 terdecies of the French Tax Code • Territorial economic contribution relief: Section 1465 of the French Tax Code • Accelerated depreciation of equipment and tools used for research operations: Section 39 AA quinquies of the FrenchTax Code
R&D Incentives	
1. Tax Incentives	

The Corporate Tax Rate	The effective corporate income tax rate ranges from between 33.33% to 35%. Based on the 2017 Finance Act, the rate will be progressively reduced to 28% over the period 2017 to 2020.
Innovation tax credit	• R&D expenses are deductible in the year they are incurred. Additionally, France offers an R&D credit equal to 30% of the first EUR 100M of qualified R&D expenditure incurred during the tax year. • The rate is reduced to 5% for qualified R&D expenditure exceeding that amount, and the 30% rate is increased to 50% in overseas territories. An "extension" of the R&D tax credit, called the innovation tax credit, is available to SMEs for certain pilot-model and prototype developments that do not qualify for the 30% R&D credit. • The 20% innovation tax credit is an additional incentive for SMEs to encourage the completion of new/improved product/process development within France by extending the tax incentive to the late stages of development that would not qualify for R&D credit. • Specifically, this credit targets certain pilot-model and prototype developments that tend to occur after the completion of R&D, as defined under French Law, i.e., Frascati Manual definition of research.
Young innovative company (YIC) status	Specific measures apply to support new companies investing more than 15% of their spending on R&D. Eligible companies are new businesses that have existed for less than eight years, are independent, qualify as a SME,3 and have at least 15% of their total expenditure is R&D expenditure. Companies that qualify for YIC status are granted the following exemptions: • Two-year decreasing corporate income tax exemption (100% for the first profitable year and 50% for the second year) • Exemption from taxes such as the *taxe foncière, Contribution Foncière des Enterprises (CFE),* and *Contribution sur la Valeur Ajoutée des Entreprises* (CVAE) upon request for up to seven years; and A seven-year capped exemption of certain employer social security contributions for R&D staff remuneration.
2. Funding Support	
R&D grant (national and regional)	The French national and local authorities offer numerous research grants that typically are targeted towards certain industries or outcomes, such as medical research, big data, green technology, smart cities, robotics, etc. Some of the grants (particularly for SMEs) cover expenses that are outside the scope of R&D. The aid rates generally amount to around 25% for large and medium-sized companies and 40% for small companies. Such aid can be combined with the R&D tax credit. These grants generally are nonrefundable cash grants, and can also take the form a refundable grant. Refundable grants are a specific type of instrument in France which require a partial (or sometimes full) repayment of the grant proceeds if the research achieves intended goals (e.g., commercial success), as defined in the grant. R&D cash grants typically are channeled, as the case may be, via the following instruments: • Competitive project calls from certain funding bodies (e.g., *Programd'Investissements d'Avenir, Agence Nationale de la Recherche, Fonds Unique Interministériel*, or innovation clusters) • Bilateral talks with the local authorities (regional councils distribute both their own funds and ERDF funds) or with the *Banque Publique d'Investissement* (a public bank offering a number of cash grants for

	SMEs).
3. Patent Incentives	
Patent box	• Income from licensing (and the sub-licensing of eligible IP rights as from 2011) or the sale of patent or patentable technology are taxed at a maximum rate of 17%1, provided the patent/patentable technology was created by the company or acquired by the French company more than two years prior to the sale. • Moreover, for the French licensee, the royalty fee is deductible at the standard corporate income tax rate (unless the licensee does not effectively exploit the IP rights or the IP rights add no value for the licensee.) • The French patent box will be subject to a review process to check its compatibility with EU and OECD guidelines, which might lead to changes.
4. Investments	
CAPEX	• Certain R&D and industrial investments can benefit from an exceptional extra depreciation equal to 40% of the original value of eligible assets (i.e., materials and equipment involved in R&D and industrial activities) manufactured, purchased, or leased. • Assets must be eligible for accelerated (declining) depreciation and must belong to one of the following categories (some categories below only apply to certain periods of the incentive)

Source: *2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD*

9. Israel

Attributes	**Brief Details**
Eligible Industries and Qualifying Costs	• A Preferred Enterprise is an industrial company whose main activity in the relevant tax year is industrial activity that is competitive and contributes to Israel's gross domestic product (i.e., no more than 75% of total income is from sales on any one market in the year concerned, and at least 25% of total income is from sales to a market with at least 12 million residents). • A Special Preferred Enterprise meets the requirements of a Preferred Enterprise and also satisfies the following criteria: ✓ The company's total annual income in Israel is at least ILS1 billion. ✓ The combined balance sheet of the company is at least ILS10 billion. ✓ The company's business plan includes one of the following: ✓ Investment in productive equipment of at least ILS400 million in a priority area or ILS800 million in the rest of the country over a three-year period ✓ Investment in R&D of at least ILS100 million in a priority area or ILS150 million in the rest of the country or employing at least 250 employees in a priority area or 500 employees in the center of the country

IP and jurisdictional restrictions	R&D activities must be carried out in Israel and the Israeli company must incur the R&D-related expenditure. Restrictions are unique to each grant program. Under most grants, the IP must remain in Israel. However, the transfer of IP outside of Israel is possible, subject to the approval of the Innovation Authority, and may require additional payments. In some programs, the resulting IP does not have to reside within Israel, although location is considered in the granting process.
Technology or innovation zones	R&D incentives are offered through the National Cyber Arena in Be'er-Sheva (see "Employment grants" in section 2).
Role of governmental bodies in administering incentives	R&D incentives are controlled by the IIA, which is part of the Ministry of Economy and Industry. Tax incentives are controlled by the Israel Tax Authority.
Statutory reference	• Law for the Encouragement of Capital Investments, 1959 • Law for the Encouragement of Industrial Research and Development, 1984 • Income Tax Ordinance
R&D Incentives	
1. Tax Incentives	
The Corporate Tax Rate	Israel's corporate tax rate currently is 24%, and the withholding tax rate on dividends is currently 25% or 33%.
Alternative tax program	Tax benefits are granted to industrial companies (including software companies) that export more than 25% of their total turnover to a market larger than 14 million persons. A corporate tax rate of 7.5% applies to companies located in "Priority Area A," and a 16% applies to companies located in other areas. If the company pays dividends during a tax year in which the full exemption is available, the dividends are taxed at a rate of 20% and any exempted taxes become immediately payable.
Strategic program	The program is intended for multinational companies whose annual gross receipts exceed ILS 10B, whose "preferred" income exceeds ILS 1B, that invest a minimum of ILS 100M in R&D projects, and that hire at least 250 new employees. If these requirements are met, the company will benefit from a reduced tax rate of 5% in Priority Area A and 8% in other areas.
Angel's Investors	A tax benefit is granted to individuals investing in qualified Israeli R&D companies, allowing them to deduct their investment from any other source of income. The amount of the deduction is capped at ILS 5M per investor, per eligible company.
2. Funding Support	
R&D grants	Companies in any industry (e.g., pharmaceuticals and medical devices, software and hardware development, and energy and utilities) engaging in innovative R&D activities are eligible for R&D grants. Qualifying expenditure includes in-house R&D costs, materials and consumables, consultant and subcontractor costs, patent registration, application costs for regulatory approval, capital investments,

	and overhead.
R&D fund	• The main program of the Innovation Authority supports R&D projects in Israel by offering conditional grants of up to 50% of approved R&D expenditure (up to 60% in Priority Area A and up to 75% in the area surrounding the Gaza Strip). If the R&D project is successful, the company must repay the grant by making royalty payments from future related revenue. • A large corporation with over ILS 100M of annual taxable income and more than 200 R&D employees in Israel, or with an R&D budget of at least ILS 20M per year, may be entitled to a grant of up to 50% of approved R&D expenses.
Special benefits for selected areas	Israel offers special benefits for R&D undertaken in special fields, including: • Traditional industries, such as food and beverages, textiles, print, metal, and plastics • Non-traditional industries, such as cyber security, the space industry, and alternative fuels. • There also are special benefits for start-ups and new companies. • A multinational corporation (over ILS 2.5B of annual revenues) investing (money or assistance) in R&D projects may be entitled to joint ownership in IP with the Israeli company. ➢ Technological incubators may be entitled to grants of up to 85% of approved expenses for nascent companies to develop disruptive innovative technologies. ➢ The "Tnufa" program is designed to encourage and support an individual entrepreneur in the initial efforts to build a prototype, register a patent, design a business plan, etc. Grants are offered up to 85% of approved expenses up to a maximum of ILS 210K for each project. ➢ The MAGNET program sponsors innovative generic industry oriented technologies through synergetic collaboration between industrial companies and academic research groups. Binational funds and bilateral agreements enable joint R&D programs with foreign counterparts worldwide.
Horizon2020	• Israeli companies can apply for grants under the European Commission's Eighth Framework Program—Horizon2020, which is the main instrument for funding R&D activities, and covers several disciplines including ICT, nanotechnologies, advanced materials, biotechnology, advanced manufacturing and processing, space, health, food security, energy, transport, the environment, and security. • Israel participates in the EUREKA funding platform, which is the world's largest R&D program that promotes industrial innovation by aiding and supporting industrial R&D projects that aim to develop new products and bring them to the market. Funding is contingent on budget and funding rates outlined by the specific call for proposal (generally 70% or 100% funding, plus a 25% overhead).
Grants for expanding activity	Industrial companies located in Priority Area A that export more than 25% of their total turnover to a market larger than 14 million persons may qualify to receive grants under either of the following tracks: • Grants for investing in manufacturing facilities: 20% of the approved total investment (30% for companies located in the south of Israel) • Grants for hiring new employees: Between 20% to 27.5% of salary costs.

3. Patent Incentives	
Innovation box	• To be eligible for Preferred Technology Enterprise status, an Israeli company must be part of a group with global consolidated revenue below ILS10 billion. To be eligible for Special Preferred Technology Enterprise status, an Israeli company must be part of a group with global consolidated revenue over ILS10 billion. • To qualify for either status, the company must have incurred at least 7% of the last three years' turnover in R&D (or the company had ILS75 million in R&D expense per year) and meet one of the following three conditions: ✓ At least 20% of its workforce is engaged in R&D (or it has more than 200 R&D employees). ✓ Venture capital investment of at least ILS8 million was previously made in the company. ✓ It had average annual growth over three years of 25% in sales or number of employees in Israel. Companies not meeting the above conditions may still be considered as a qualified company under the IIA's discretion.

Source: *2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD*

10. India

Attributes	Brief Details
Eligible Industries and Qualifying Costs	A 100% deduction is available to all industries on revenue and capital expenditures (other than expenditures incurred for the acquisition of land) paid out or expended in scientific research related to the business. A number of requirements must be met for expenditure incurred on in-house R&D to qualify for the super deduction, including the following: • The R&D unit must be located in a separate earmarked area • The R&D unit must have its own personnel;**s1** The qualifying R&D expenses may not be deductible under any other provision of the tax code • The R&D facility may not be used exclusively for market research, sales promotion, quality control, testing, commercial production, style changes, routine data collection, or similar activities. • The company must maintain a separate account for each approved facility, which must be audited annually, and a copy of the audit must be submitted annually to the Secretary of the DSIR by 30 November. • Assets acquired with respect to the development of scientific R&D facilities may not be disposed of without the approval of the Secretary of the DSIR. Qualifying expenditure includes • Wages • Supplies • Utilities • Other expenses directly related to R&D • Expenses incurred in clinical drug trials qualify for research tax incentives only if pre-approved by the regulatory authority under a central, state, or provincial act and a patent application is filed under the Patents Act (1970) for the new drug/therapy developed through the clinical trials.

	Specifically excluded expenses include • general and administrative costs • depreciation • overhead and allocated expenditure • Non eligible items under Eleventh Schedule include beer, wine, alcoholic spirits, tobacco and tobacco preparations, cosmetics and toilet preparations, toothpaste, dental cream, tooth powder and soap, aerated waters, confectionary and chocolates, gramophones, projectors, photographic equipment and office machines, such as calculators and cash registers.
IP and jurisdictional restrictions	• R&D activities must be conducted in India. There is no location restriction with respect to IP. • IP can reside outside the country subject to ownership remaining with the Indian Company who has undertaken such R&D. Further, foreign patent filing expenditure is not allowed as a weighted deduction. Following conditions must be satisfied in order to claim the deduction: • The company must be registered in India. • The main object of the company must be scientific R&D. • The company must be approved by the Chief Commissioner of Income Tax.
Technology or innovation zones	Certain exemptions occurs in accordance to special economic zones.
Role of governmental bodies in administering incentives	Further, where any expenditure is incurred before business commences in order to pay salaries to employees engaged in scientific research or to purchase materials used in scientific research, all such expenditures as certified by the Director General of Income Tax (Exemptions) (DGIT(E)), Principal Chief Commissioner of Income Tax (CCIT) and the Department of Scientific and Industrial Research (DSIR) within three years immediately preceding the commencement would be allowed.
Administrative requirements	• Specific DSIR approval is required to take advantage of super deduction benefits. • The company will be eligible for the super deduction only if it enters into an agreement with the DSIR for cooperation in an R&D facility and for audit of the accounts maintained for that facility. • Incentives related to expenditure on scientific research, contribution sto R&D and for units set up in the northeastern states of India. • No particular forms have been prescribed under the tax laws for claiming a tax incentive. However, the assessee may claim the deduction by filing a tax return within the time prescribed for the financial year in which the expenditure is incurred.

Statutory reference	**Accelerated depreciation** • Section 35(1) of the Income-Tax Act, 1961 (the Act) **Super deductions** • Section 35 of the Act • Patent-related incentives • Section 115BBF of the Act **Tax holiday for export profits for units in an SEZ** • Section 10AA of the Act **Patent-related incentive** • Section 115BBF of the Act **Funding for R&D activities in technology** • Project Funding Guidelines issued by the Technology Development Board **Fiscal Incentives under M-SIPS and EMC schemes** • M-SIPS: DEITY Notification No. 24 (10)/2010-IPHW, dated 27 July 2012, as amended by DEITY Notification No. 27 (35)/2013-IPHW, dated 3 August 2015 • EMC: DEITY Notification No. 8(50)/2011-IPHW, dated 22 October 2012 **Customs duty exemption (related to the agrochemical sector)** • Customs Notification No. 12/2012, dated 17 March 2012 **Customs duty exemption (related to in-house research units)** • Customs Notification No. 50/1996, dated 23 July 1996 (as amended from time to time) **Concessional rate of duty (related to research institutes)** • Customs Notification No. 51/1996, dated 23 July 1996 (as amended from time to time) **Excise duty exemption (related to research institutes)** • Central Excise Notification No. 10/1997, dated 1 March 1997 (as amended from time to time)
R&D Incentives	
1. Tax Incentives	
The Corporate Tax Rate 30% (reduced to 25%)	Corporate tax rate in India is also contains a surcharge and education cess
Super Deduction for in-house R&D expenditure **(*A deduction for R&D expenditure is net of any grants/gifts, donations, payments, or gains on the sale of R&D assets*)** **If the taxpayer is in a loss situation, unused benefits may be carried**	• A 200% super deduction for in-house R&D expenditure, including capital expenditure (other than land and buildings). The super deduction is limited to taxpayers engaged in the business of biotechnology, or manufacturing or producing products (other than products on the negative list). • The R&D facility must be approved by the Department of Scientific and Industrial Research (DSIR) for a company to qualify for the super deduction. • The benefit was available till 31 March 2017; the super deduction is reduced to 150% for the period 1 April 2017 to 31 March 2020. ***200% (scrapped to 150%)*** • A super deduction was available till 31 March 2017 for specified payments made

forward for the following eight years, but cannot be carried back.	to a scientific research company/ research association/university/college/other institution for the purpose of scientific and statistical research. Such payments will be 100% deductible as from 1 April 2017. ***125% (scrapped to 100%)*** • A super deduction was available till 31 March 2017 for specified payments made to certain scientific research associations, approved universities, colleges, or other institutions. The super deduction is reduced to 150% for the period 1 April 2017 to 31 March 2020, and it will be eliminated as from 1 April 2020. ***175% (scrapped to 150% and will be eliminated after 2020)*** • A 100% deduction is available for R&D expenses (other than land) that otherwise do not qualify for the above super deductions. A deduction is available for R&D expenditure incurred before an R&D center is set up, subject to certain conditions.
Incentives related to Customs and Excise	• Customs duty exemption on goods imported for R&D and central excise duty waiver on purchases of indigenous goods for R&D to public funded and privately funded institutions registered with DSIR. • DSIR recognized in-house R&D units engaged in R&D in biotechnology and pharmaceuticals sectors can import specified equipment duty free (List 28). • In respect of R&D units with manufacturing facilities, the benefits of full customs duty exemption for specified equipment is also available for manufacturing activity to the extent of 25% of the previous years export turnover. • Central excise duty waiver for 3 years on specified goods designed and developed by a wholly owned Indian company, National laboratory, Public funded research institutions or Universities and patented in any two countries from amongst India, USA, Japan and in any one country of the European Union. The specified goods are manufactured by a wholly owned Indian Company. This exemption is available based on certification from DSIR (Notification No. 13/99-central excise dated 28th February 1999).
Tax incentives for exports	• Provided certain conditions are fulfilled, export profits earned from a new undertaking set up in an SEZ are eligible for a 100% tax exemption for the first five years, starting from the year manufacturing commences, followed by a 50% tax exemption for the following five years. • A further five-year tax exemption of 50% of the export profits then is available, subject to an equal amount of profit being retained and transferred to a special reserve. During the exemption period, the minimum alternate tax must be paid, for which a credit is available.
Tax incentive for hiring new personnel	• To encourage the hiring of new employees, a deduction of 30% of additional wages paid to new regular employees in a factory is allowed for three years. • This super deduction has been extended to taxpayers across all sectors (that are subject to tax audit) to the extent the costs are incurred on an employee with total remuneration of up to INR 25K, and the employee has been employed for at least 240 days.
Training—Tax incentives for expenditure incurred on skill development projects	• Companies engaged in manufacturing and production (other than alcoholic spirits and tobacco products) or providing specific services (such as construction, healthcare, market research, etc.) are allowed a weighted deduction of 150% of expenditure (other than expenditure incurred on land and buildings) incurred in skills development projects, provided certain conditions are fulfilled. • A 150% deduction of qualified costs incurred to develop the targeted skills is available until 31 March 2020; the deduction then reduces to 100%.
Deductions for expenditure on scientific	A weighted deduction of 200% is available for scientific research on in-house R&D expenditure as approved by the DGIT(E) and DSIR, including capital expenditures

research by manufacturing entities	(other than land and buildings) by companies engaged in manufacturing and the production of articles and things except for those articles or things specified in the Eleventh Schedule2 or for companies engaged in the biotechnology business.
2. Funding Support	
R&D Grants/Equity/Loans	Various ministries and departments under them provide R&D grants to industries. Some of them are as: • Technology Development Program (TDP)-DSIR • Technology Development Board (TDB)-DST • SBIRI, BIPP-BIRAC, DBT These schemes invests in the equity capital or gives loans to industrial concerns and research associations that are attempting development and commercial application of indigenous technology or adapting imported technology to wider domestic applications. The Board also provides grants. However, this mode of funding is not particularly popular with multinational corporations, and grants are provided by the Board only in exceptional cases. Various funding schemes under ministries/ department of Govt. of India for Technology development, upgradation and commercialization. (eg. DST, DSIR, DBT, CSIR, ICMR, ICAR, TDB, TIFAC, MNRE, MoEF, MoSteel, MoFPI)
Financial Assistance under M-SIPS and EMCs schemes	• The M-SIPS will be applicable to investments in ESDM units for expansion of capacity, modernization and diversification of existing ESDM units. • Subsidies equal to 25% of capital expenditure if the ESDM unit is in a non-SEZ and 20% of capital expenditure if the ESDM unit is within an SEZ, with capital expenditure subsidy available for investments made within 10 years from the date of approval of the project The Government offers financial assistance for the development of Greenfield and Brownfield Electronic Manufacturing Cluster (EMC). • Assistance up to 50% of the project cost is available. The incentive is subject to a ceiling of INR0.5 billion for every 100 acres of land, in the case of Greenfield EMC. • Assistance up to 75% of the project cost is available. The incentive is subject to a ceiling of INR0.5 billion, in the case of a Brownfield EMC. Implementation of the scheme is made through a Special Purpose Vehicle (SPV) that will carry out the business of developing, operating and maintaining the infrastructure, amenities and other common facilities created in the EMCs. The SPV should be a legal entity (i.e., company or society) that is duly registered. SPVs can be promoted by private companies, industry associations, financial institutions, R&D institutions, state or local governments, or their agencies and units within the EMC. The selection and location of the EMC under the scheme shall be approved by the relevant Government authorities. The scheme's sunset clause — originally 26 July 2015 — has been extended to July 2020. Such incentives may be claimed by filing the requisite documents with Department of Electronics and Information Technology (DEITY). However, DEITY has not prescribed the precise mechanism for disbursement of incentives under the scheme.

3. Patent Incentives	
Patent box	• Royalty income of an Indian resident that owns a patent developed and registered in India is taxed at a rate of 10% (plus the applicable surcharge and cess) on a gross basis. Royalty income is included in the patent box as from tax year 2016–2017. • As proposed in Budget 2017, the corporate tax rate may be reduced to 25% (plus the applicable surcharge and education cess) for: (i) Indian companies whose total sales or gross receipts do not exceed INR 500M during the tax year 2015-16; and (ii) newly incorporated (i.e., on or after 1 March 2016) manufacturing companies that do not claim any income tax incentives or exemptions. The following conditions must be satisfied in order to claim the benefit: • The patent should be developed and registered in India. • "Developed" is defined to mean "at least 75% of the expenditure incurred by the assesse for invention in respect of which patent is registered." • An eligible assessee is any person resident in India who is the true and first inventor of the invention and whose name is entered on the patent register as the patentee under Patents Act, 1970. • Eligible income is income by way of royalty from patents developed and registered in India
4. Investments	
CAPEX—Tax exemption for units in North Eastern Region of India	• Tax benefits are available for setting up undertaking/manufacturing facilities in the north eastern states of India. No area restrictions are applicable, i.e., an undertaking can be set up anywhere in the specified regions. • Undertakings located in these states that (i) begin to manufacture or produce an eligible item (ii) undertake substantial expansion (iii) commence a qualifying business between 1 April 2007 and 1 April 2017 are eligible for a 100% deduction of profits for 10 consecutive years.
CAPEX—Tax incentives for expenditure incurred on agriculture extension projects	• A deduction of 150% of expenditure incurred by a taxpayer on agricultural extension projects is allowed if certain conditions are fulfilled. The 150% deduction is available until 31 March 2020; it then reduces to 100%.
CAPEX—Other state level incentives	To encourage the industrialization of certain states, the following incentives are offered: • Stamp duty reimbursement • Land cost rebates • Land conversion cost • Power cost reimbursement • VAT reimbursement • Infrastructure development cost reimbursement.
CAPEX—Investment allowance for manufacturers	• A company engaged in manufacturing is eligible for an investment allowance of 15% of the value of investments in production-related equipment and other assets, subject to the fulfilment of certain conditions. • To qualify, the company must acquire and install new assets, and the related investment must meet a specified threshold.

CAPEX—Modified Special Incentive Package Scheme (M-SIPS)	Special incentives are designed to encourage investment in the electronics systems design and manufacturing (ESDM) sector. These incentives apply to existing manufacturers and service providers in the sector, and the investment must relate to listed products covered under M-SIPS regime. There are investment thresholds applicable to different categories and the deadline for applying for incentives is July 2020. Incentives are provided through capital subsidies. The financial incentives available under the scheme are: • Reimbursement of countervailing duties (CVD) and excise duties on capital equipment for non-SEZ units • Reimbursement of central taxes and duties (i.e., custom duties, excise duties and service tax) for 10 years in the selected high-tech units, such as fabs, semiconductor logic and memory chips, and LCD fabrication • The incentives also require minimum investment thresholds for various categories and sub-categories of eligible products. The minimum investment thresholds vary from INR10 million (for mobile phones and accessories) to INR50 billion (for memory fabrication).
CAPEX—Tax incentives for infrastructure development undertakings	A tax holiday of 100% of profits for 10 of the first 15 consecutive years is available to enterprises engaged in the business of power generation, transmission, or distribution; developing or operating and maintaining a notified infrastructure facility, industrial park, or SEZ; substantially renovating and modernizing the existing network of transmission or distribution lines (between specified periods); or laying and operating a cross-country natural gas distribution network.3 To qualify for the tax holiday, operations must commence on or before 31 March 2017. On or after 1 April 2017, a deduction of 100% of capital expenditure incurred on setting up the infrastructure facility will be available.

Source: *2017 Survey of Global Investment and Innovation Incentives-Deloitte; Worldwide R&D Incentives Reference Guide 2017-EY; Global R&D Incentives Group-pwc; Compendium of R&D Tax Incentive Schemes: OECD countries and selected economies, 2016-OECD*