

Weighted deductions for in-house R&D: Does it benefit small and medium firms more?

Sunil Mani¹, Janak Nabar² and Madhav S. Aney³

¹ Visiting Professor, National Graduate Institute for Policy Studies, Tokyo (on leave from CDS, Trivandrum)

² CEO, Centre for Technology, Innovation and Economic Research, Pune

³ Assistant Professor of Economics (Education), Singapore Management University, Singapore

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The importance of R&D by private sector enterprises to achieve the national goal of raising Gross Expenditure on Domestic R&D (GERD) to at least 2 per cent of the country's GDP cannot be emphasized enough. If India is to emerge a major manufacturing hub, a broad based increase in investments in R&D is essential to both absorb imported technologies and indeed in developing local technological capabilities.

In India today, industrial R&D spending is heavily concentrated, with around 20 firms accounting for 60% of India's total industrial R&D spending, and 60 firms accounting for around 80% of total spending. To encourage increased and broad based spending on R&D by industry, tailoring policies to firms that respond most to R&D incentives will make these policies most effective. One such incentive is the government's tax incentive for R&D that has seen a reduction in the weighted deduction amount from 200 percent to 150 percent starting April 2017. From fiscal year 2020-21, the weighted deduction on R&D expenditure will be further lowered to 100 percent.

Based on our preliminary analysis (Refer to A and B in Appendix), we find that having a weighted deduction policy appears to benefit firms, although the effect is mainly for small and medium sized firms. Going forward, the government could consider applying differential rates for weighted deduction depending on the size of a firm (rather than the planned reductions that applies to all firms). This would tie in appropriately with the Government's focus to provide support to small and medium enterprises.

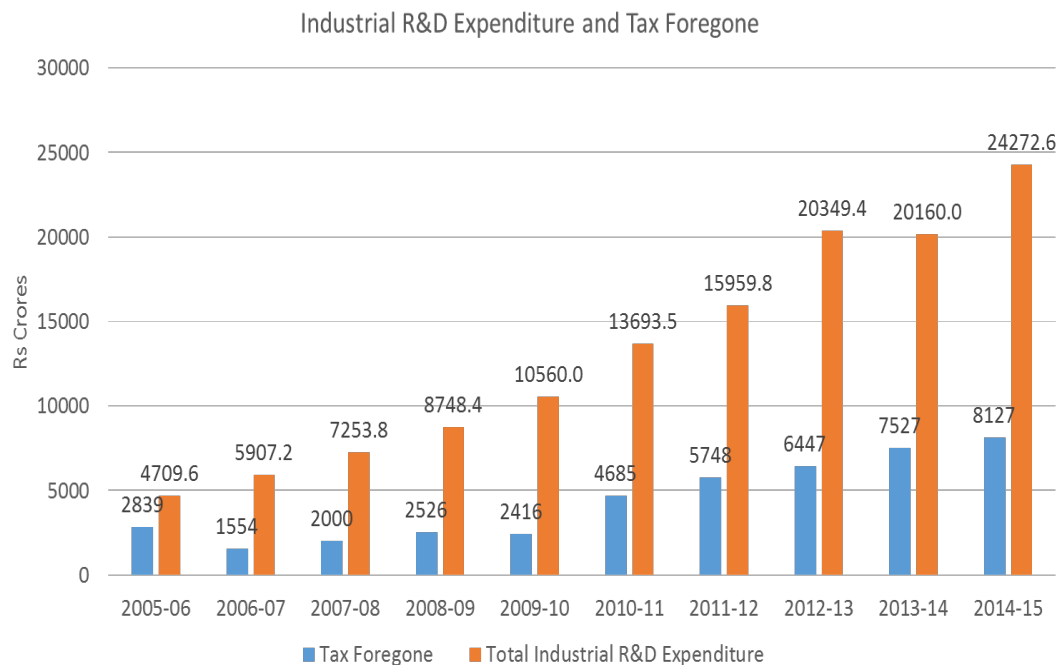
Importance of tax subsidies for R&D and insights from an empirical exercise

Tax subsidies are an important incentive tool for R&D. By its very nature, R&D is partly a public good where the social returns on investment tend to be higher than the private returns. As a result, firms may tend to typically under-invest in R&D, and the market determined R&D level being below the socially desirable level.

By simply examining Figure 1 to trace the evolution of R&D spending in India and the total tax foregone as a result of the various incentives the government offers for R&D (the weighted deduction policy is just one of them), it is not possible to discern the true impact of the weighted deduction policy on R&D spending in India. It is also impossible to see whether small and large firms respond differently to these incentives.

It would be helpful if policymakers undertook a more sophisticated analysis when thinking about how the current policy should evolve. As a first step towards a more comprehensive evaluation of the impact of the weighted deduction policy, we have analysed the impact of the policy on individual firms. For a firm to be eligible to claim weighted deduction, it must first appear on the Department of Scientific and Industrial Research (DSIR) approved list of firms (under section 35 2(ab) of the IT Act, 1961). We have considered data between FY2008 and FY2014. Our analysis reveals that being on the DSIR list has a significant and positive impact on R&D spending at the firm level.

Figure 1: Evolution of R&D spending and total tax foregone for all R&D incentives



Source: Union Budget Documents, Prowess, Sunil Mani, CTIER

This finding is robust to accounting for effects of other variables such as firm exports from previous years, sales from previous years as well as growth of R&D spending in previous years in an attempt to capture the drivers of R&D spending. We account for unobservable firm characteristics that stay constant over time that may have impacted R&D spending. Similarly, we also account for possible global and domestic events in a particular year that would have likely impacted the economy.

Further analysis reveals an interesting pattern. We find that the effect is especially strong for firms that spend less than Rs. 10 crores on R&D. This suggests that small and medium firms may be responding more to such a policy compared to large firms that spend on R&D regardless of this incentive. We also find that if one restricts the

entire sample of firms to the period FY2011 until FY2014 (after the introduction of the 200 percent weighted deduction), there appears to be a diminished impact on R&D spending of being on the DSIR list. This lends some justification to the government's decision to lower the amount of weighted deduction from 200 percent to 150 percent.

For a more complete evaluation of the policy in question, it would also be important to consider data on the amount of weighted deduction that was given to individual firms. This would help inform policy makers as to what proportion of the tax foregone is driven by small or medium versus large firms. One criticism of the above empirical exercise could very well be that certain firms only applied for weighted deduction in those years when they knew they were likely to spend on R&D, leading to a selection bias in the analysis.

The authorities should undertake a more comprehensive evaluation of the weighted deduction policy for R&D, and consider tailoring it to small and medium enterprises. Applying differential rates for weighted deduction depending on the size of the firm would tie in appropriately with the government's focus to support small and medium enterprises. It could also help reduce the cost for the government in terms of tax foregone, while encouraging more broad based spending on R&D with the aim of achieving the 2 percent target for GERD as a percent of GDP.

Appendix

A. Table 1: Regression Results

Table 1: The effect of DSIR on R&D spending

	(1)	(2)	(3)	(4)	(5)
DSIR	0.255*** (0.0390)	0.252*** (0.0411)	0.244*** (0.0410)	0.232*** (0.0398)	0.139*** (0.0312)
L.ln_exports		0.0973** (0.0418)	0.0712* (0.0392)	0.0328 (0.0384)	0.0136 (0.0309)
L.ln_profits			0.103*** (0.0307)	0.0503 (0.0355)	0.0289 (0.0214)
L.ln_sales				0.471*** (0.152)	0.269*** (0.0920)
L.ln_rnd					0.357*** (0.0472)
Constant	3.026*** (0.0412)	3.486*** (0.283)	3.079*** (0.298)	-0.641 (1.222)	0.0159 (0.752)
N	2379	1801	1677	1677	1618

Notes:

- Dependent variable in all columns is the log of R&D spending.
- Standard errors clustered at the firm level are shown in parentheses.
- All specifications include year and firm fixed effects.
- * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

B. Data used in the analysis

We would like to highlight the data used in our preliminary study and the gaps that exist.

Table 2. Data gaps need to be addressed

1	2	3	4	5	6
Fiscal Year	Total R&D Spending by 472 firms (Rs. Cr.)	Total No: of firms on the DSIR List	Total No: of DSIR firms who have reported R&D spending in Prowess	Total R&D Spending by Firms on the DSIR List (Rs. Cr.)	% of total R&D Spending by 472 firms
2008	5485.69	175	120	3280.61	59.8
2009	6352.6	187	118	3426.68	53.9
2010	7618.76	215	130	4336.41	56.9

2011	10175.45	307	172	8028.26	78.9
2012	11784.35	149	65	1026.47	8.7
2013	14495.74	218	73	1643.1	11.3
2014	15260.9	207	62	1743.41	11.4

Source: Authors' calculations

1. The sources for the data were DSIR annual reports and the Prowess database (data reported in company annual reports).
2. We identified 894 firms that appeared at least once on the DSIR list between 2008 and 2014.
3. Of these 894 firms, the Prowess database reported data on R&D spending for only 472 firms.
4. In India, the top 100 R&D spenders account for around 85% of India's total industrial R&D spending – the data for these top 100 firms are captured by the Prowess database.
5. In the table above, there exists a gap between the number of firms on the DSIR list (column 3) and the number of firms on the list whose R&D spending is captured by Prowess (column 4). The latter is much lower than the former.
6. We can roughly assume that apart from a few large firms, the bulk of the firms on the DSIR list are small firms (even the missing firms in column 4) – R&D spending data of large firms is captured by Prowess. Looking at column 6, it appears that in the 2012-2014 period, the large firms may not have been on the DSIR list at all – i.e. they may not have availed of the weighted deduction.

C. Discussion held with DSIR representative in March 2016:

- R&D expenditure data reported in the annual report may be from different years (over the past 3 years).
- Some companies report at group level (in Prowess), but may have separate DSIR recognized labs.
- Some report as individual R&D centres which have been recognized by DSIR - these appear on the R&D expenditure list of DSIR annual reports.

- Once a firm is recognized as an R&D centre by DSIR for a period of 3 years, the R&D centre can seek weighted deduction from tax authorities. Approval of what constitutes as R&D expenditure for weighted deduction has to be sought each year from DSIR. Once approved for weighted deduction, the company name appears on the list of companies approved under section 35 2(ab).
- Some companies that have dropped off the recognized list may not re-file for recognition immediately. List is therefore dynamic.
- 900-1000 companies have been approved for weighted deduction till date.