



Evaluation Dutch R&D tax credit scheme (WBSO) 2011-2017

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Summary

The WBSO, a tax credit scheme for R&D in companies, was introduced in the Netherlands in 1994.¹ The main aim of this incentive is to increase firms' R&D efforts and at the same time generally improve the business climate for R&D activities.² The R&D that qualifies for this incentive is 'technical scientific research' and the 'development of new technical products, production processes and software'. In 2019 this WBSO scheme, which is carried out by RVO.nl, offers a deduction rate of 32% in the first bracket (up to EUR 350,000 of eligible R&D costs and 40% for starters) and 16% in the second bracket.³

The WBSO scheme – with nearly EUR 1.2 billion tax reductions redeemed in 2017 – together with the 'Innovatiebox' (patent box with a budgetary provision of EUR 1,554 million in 2017) are the main schemes in the Netherlands for stimulating R&D in individual firms and improving the business climate for innovation activities.⁴

Legitimacy

Companies invest in R&D because they expect that the new knowledge and insights they acquire can be translated into innovative and distinctive goods, services and process innovation. These innovations must play a part in improving companies' profitability and competitive strength. Society benefits from the accumulation of knowledge, innovations becoming available (also to solve diverse societal issues) and the associated productivity gains. The R&D market does however experience failures. The existence of positive externalities like spillovers generally means that in practice, the level of private R&D investment is lagging behind the optimal and desirable level for society. Internalising (compensating for) spillovers is therefore the best argument that governments use to stimulate R&D in companies through tools like the WBSO scheme. Another aspect, which is closer to the WBSO's second aim, is that this scheme helps to reduce the tax burden for knowledge-intensive companies and in this way improves the business climate for their activities.

¹The WBSO sometimes uses a more specific definition (S&O) of the term Research & Development, to refer to technical R&D.

²It is about attracting foreign R&D companies, stimulating start-up R&D companies, and maintaining and if possible expanding R&D activities in existing businesses.

³In late 2018 the administration decided that the expansion of the 2nd bracket from 14% to 16% planned for 2020, should be implemented in 2019, reserving an additional EUR 76 million for the WBSO scheme.

⁴The share of generic, indirect instruments (WBSO and Innovatiebox) in the total budget for stimulating company R&D has increased, while specific direct support for R&D through subsidies has declined.

Design and adjustments

Up until 2016, the WBSO scheme was only a tax benefit for R&D wage costs at firms and a deduction in income tax for R&D taxpayers (self-employed persons). In addition, the WBSO-related Research and Development Deduction (RDA) was introduced in 2012. This RDA was a tax benefit scheme for R&D material costs and capital expenses (not wages). The main difference was that the RDA for companies (except self-employed) offered tax benefits calculated through corporate tax. From 2016 the RDA is included in a new WBSO scheme which also offers tax benefits for R&D material costs and capital expenses.⁵ This benefit is obtained through a reduction in the payable wage tax.⁶ The R&D tax incentive instruments were adjusted in the evaluation period 2011 to 2017. Apart from regular changes in deduction rates and brackets these included a.o. the introduction in 2012 of the RDA (broadening the tax subsidy base for advancing R&D in firms as non-payroll R&D costs were also included) and the reduction in 2016 of projecttypes that qualify for WBSO from four to two and a further clarification of R&D in software development. Other changes as of 2016 were the changed lump sum taxation regime entitling more companies to use it, abolishing the ceiling in the WBSO and integration of the RDA into the WBSO.

Evaluation aim and approach

The aim of the evaluation is to assess to what extent the WBSO has effectively contributed over the period 2011-2017 (and the RDA from 2012 to 2015) to increasing the R&D efforts of companies (1st order effect), innovation (2nd order effects), firm performance (3rd order effects) and the (fiscal) climate for R&D businesses in the Netherlands. This compound question requires insight in the WBSO's target group and users, how the scheme is applied and the administrative costs involved. The evaluation consisted of a combination of methods (see also section 1.3 and appendices), namely: desk study, analysis of the administrative data (partly combined with CBS data), econometrical analyses, an extensive online survey, interviews/group discussions and a textmining analysis. The evaluation was carried out between July 2018 and February 2019. Below we present the WBSO scheme in an international perspective along with the conclusions and recommendations. For more details, see chapters 2-6.

International perspective

More and more developed countries have R&D tax credit schemes stimulating company R&D. A recent OECD overview showed that in 2017, 30 of the 35 OECD countries and 21 of the EU member states had similar tax schemes. There are considerable differences between countries in how they design an R&D tax credit scheme. The Dutch scheme is mostly in line with the options featured in the literature. The WBSO (and previously the RDA) is a volume-based scheme aimed at lowering R&D payroll costs (associated with the highest spillovers) as well as R&D non-payroll costs. The WBSO stimulates especially starters and is designed in such a way that loss-making companies and starters with low or no profits can benefit. The Dutch application procedure for WBSO users is relatively short. It is combined with an ex ante review to prevent surprises, yet at the same time be able to give the R&D expenditure an incentive at a relatively early stage of the R&D process. Theoretically, there are suggestions that tax incentives should focus on more radical forms of R&D with a higher

⁵Including buying in certain services that do not include hiring labour or outsourcing research.

⁶Exceptions are the self-employed who sort out the tax advantage via income tax.

“novelty level” (clearer market failure, attracts more R&D, higher spillovers).⁷ Like other countries with R&D tax credit schemes, the Netherlands prefers to stimulate radical as well as less radical R&D, precisely in order to promote R&D also in a wide section of small and medium enterprises (SMEs). Compared to similar schemes abroad, the WBSO is a relatively generous scheme especially for SMEs.

Overarching assessment

We find the WBSO a cost-efficient scheme that is valued by the majority of users and has a visibly positive effect on companies' R&D payroll. It is also likely that the WBSO contributes among other things to the business climate for those companies that organise their R&D activities on an international scale (“internationals”). Our evaluation does not compare the economic gains from additional R&D as a result of the WBSO with its economic costs (cost-benefit analysis). The macro-effectiveness can only be approximated. Bearing in mind the spillover effects, we conclude that the benefits of the WBSO are greater than the costs.

Conclusions on reaching target group

As part of the preparation for the econometric analyses, the evaluation examined what R&D companies thought of the WBSO and what shifts have occurred in the evaluation period of 2012-2017 (and earlier, in 2006-2017). This has provided a great deal of factual information. The highlights are:

1. The WBSO is a generic R&D incentive scheme that assists SMEs to a considerable extent (97% of the users in 2017 is an SME). Large businesses receive 37% of the total WBSO budget even though in terms of budget, this group conducts nearly 60% of all business R&D with its own personnel.⁸
2. The number of WBSO users has grown from 20,533 in 2012 to 21,263 in 2017, the peak being in 2015 (22,977). The scheme has seen a considerable increased use in the past two years. This is mainly because of the changed lump sum taxation regime, to which many more companies were entitled as of 2016. This increase is not reflected in a higher number of R&D hours realised but in R&D non-payroll costs (former RDA component).
3. According to CBS statistics, 31% of the companies with 10 or more employees that carry out R&D with their own personnel do not make use of the WBSO. This group seems to have grown since the time of the previous evaluation, but mostly for data-technical reasons (such as CBS changing the definition of R&D, the random sampling method, and the companies included) and this is therefore an overestimate. Nevertheless, there is definitely a small group of innovative companies not using WBSO, also because their R&D activities are not covered by the WBSO's definition of R&D (not being aware of non-technological R&D) or because they feel the potential advantages do not outweigh the administrative burden.

⁷See the European Commission's Directorate-General for Taxation and Customs Union (2014), A Study on R&D Tax Incentives. Final report, Taxation papers, Working paper no. 52 – 2014, European Union, Luxembourg. See footnote 203.

⁸See CBS (2017), ICT, kennis en economie 2017, p. 199.

4. The introduction of the RDA in 2012 considerably increased the tax subsidy base for advancing R&D in companies, as non-payroll R&D costs are now included. It was not possible to analyse the impact of the RDA (separate from the WBSO) due to limited data. However, it is clear from the administrative data, the survey and the interviews, that integrating the RDA in the WBSO has played a part in the fact that companies actually make use of this compensation.
5. During the evaluation period, the amount of WBSO projects of the type 'techno-scientific research' declined, also after two types of projects — 'analysis of technical feasibility' and 'process-oriented technical research' — no longer qualified in 2016. This is to do with the fact that from 2015, public knowledge institutes were no longer entitled to use the WBSO. Abandoning these two types of projects has only had a limited effect on the drop in total numbers of companies utilising the WBSO. The survey and interviews highlight that specific segments of innovative companies miss these abandoned types of projects.
6. Clarifying the software description from 2016 onwards ended the projects' increasing focus on software. Calculated over the entire period from 2011 to 2017, the manufacturing industry's share of WBSO users dropped from 32% to 23%, and the sector Information and communication's share still rose from 9% to 21%.
7. During the evaluation period (except 2017), an increasingly larger group of companies used the WBSO as well as the Innovatiebox. The higher the companies' number of R&D hours worked, the more they make use of the Innovatiebox.
8. The extent of the clearing problem ("granted WBSO/RDA that cannot be fully redeemed because there is no fiscal space left") has diminished with the integration of the RDA and the WBSO, especially for starters. Just because starters' wages tax bill is greatly reduced (and they therefore stop paying wages tax earlier as compared to regular firms) and also because starters can apply a higher hourly rate for an R&D employee than they in fact pay, means we can call this a "luxury problem". Anyway, they are already well facilitated. In terms of budget, the clearing problem is relatively moderate.
9. The majority of users (85%) stated that the way the WBSO encourages formalised and planned R&D in individual enterprises sufficiently matches how R&D is carried out in their firms. Users who experience a mismatch, talk about the lack of flexibility when applying and being awarded WBSO and an insufficient tie-in with innovative software development in practice.
10. The rapidly advancing importance of digital concepts such as artificial intelligence and machine learning (and the associated programming languages) for WBSO applications is apparent in very diverse sectors. A first exercise applying two variants of textmining analyses of WBSO project applications from 2011 to 2017 shows that central (pre-determined) digital concepts are expanding rapidly. These digital concepts manifest themselves in a broad set of varied industries, illustrating the broad range of possibilities for cross-overs and spillovers in ICT.

Conclusions regarding effectiveness

11. By lowering the user costs, the WBSO raises the R&D wage bill. This positive effect increases a firm's number of (performed) R&D hours and only to a limited extent the average hourly R&D wage.
12. In the smallest companies (fewer than 10 workers), the effectiveness of the WBSO (the users' cost elasticity) is relatively low. This is possibly due to their limited ability to make (short term) adjustments.⁹ Moreover, our analysis only examines how changes in the WBSO affect the R&D wage bill in companies that already carry out R&D; we are not measuring the effect of newcomers that start using WBSO. There is too little variation within the group of medium sized and large companies to reliably estimate differences in the effect of a change in user costs. Every company is included for calculating the total user cost elasticity and the *Bang for the Buck* (BFTB).
13. The estimated volume of the short term *Bang for the Buck* (BFTB)¹⁰ is 0.7 and 0.9 for the long term in the evaluation period 2011 to 2017, see Table 1.¹¹

Table 1: Short and long term weighted average Bang for the Buck, based on average user cost elasticities, 2011-2017

	Average	95%-confidence interval
Short term BFTB	0.70	0.52 - 0.87
Long term BFTB	0.90	0.72 - 1.09

If we just take the number of WBSO participants, in the short term every euro of tax reduction leads to an estimated 70 euro cents in extra R&D wages. In the long term that is an estimated 90 euro cents per euro of tax reduction. This means that one euro extra tax reduction over an 'infinite period' results in an estimated 0.90 additional R&D wage bill, which is a direct effect of the WBSO. The survey findings and the literature point to spillover effects on top of this. Our econometric estimates suggest that the effectiveness of the WBSO in terms of BFTB has declined somewhat over time (that is to say we predict a little higher BFTB values over the longer period 2008 to 2017).

14. Considering the impact on the R&D wage bill, the WBSO has achieved an estimated annual average of EUR 0.72 billion extra in R&D wages in the evaluation period 2011 to 2017. In the same period EUR 2.2 billion in R&D wages supported by the WBSO would also have been conducted without WBSO.

⁹ The group with a maximum of four workers includes many holdings/private management companies with directors-large shareholders. This category is not likely to carry out more R&D or expand their workforce.

¹⁰BFTB is defined as the extra R&D wage bill generated by the scheme, per euro of tax subsidy awarded. A BFTB of one, means that every euro of tax reduction is translated as one euro extra R&D wages expenditure. The BFTB can be derived from the elasticities as estimated by the model. We opt for the average user cost elasticities as we want to know a company's total extra R&D wage bill as a result of the WBSO, compared to the full amount of tax subsidy the company receives.

¹¹The econometric analyses which form the basis of these estimates include significant assumptions and limitations which are detailed in chapter 4 and appendix 3.

This is 75 percent of the total R&D wages supported by the WBSO (EUR 2.9 billion a year), see Table 2.

Table 2: Estimated annual average impact of the WBSO at macro level 2011-2017 (withholding agents), if relevant, the 95% confidence is in brackets

Description	Average value per year (2011 to 2017)	
Total fixed WBSO tax reduction ¹²	EUR 0.80 billion	a
Weighted average Bang for the Buck 2011-2017	0.90 (0.72-1.09)	b
Total extra R&D wage bill as a result of the WBSO	EUR 0.72 (0.58-0.87) billion	c=a*b
Total gross R&D wage bill for companies in the Netherlands, of which:	EUR 3.36 billion	d=e+f
- Supported by the WBSO	EUR 2.94 billion	e
- <u>not</u> supported by the WBSO ¹³	EUR 0.43 billion	f
R&D wage bill supported by WBSO, conducted without WBSO	EUR 2.22 (2.07 -2.36) billion	g=e-c
R&D wage bill supported but conducted without WBSO as percentage of the total R&D wage bill supported by WBSO	75 (70-80) %	h=g/e
Additional R&D wage bill as a result of WBSO (percentage of the total gross R&D wage bill)	22 (17-26)%	i=c/d

The total R&D wage bill including the part not supported by the WBSO, amounts to an average of EUR 3.4 billion a year. An estimated 22% is a result of the WBSO.

15. In the econometric analyses we determined the 1st order effects. We found that the WBSO had a positive effect on companies' R&D wage bill. We also found a positive correlation (so not a causal relationship, which we did not investigate) between the R&D wage bill and the share of turnover from innovative products and services, and between the R&D wage bill and additional value per worker. The survey results and the literature do indicate the existence of such higher order effects.
16. From an economic perspective, companies that make considerable use of the WBSO (in R&D hours) state in the survey that they benefit to a great extent from the results of their WBSO projects.
17. According to self-reported behavioural changes, specific user groups think that the WBSO has contributed to professionalising R&D activities. This lies for example in attracting specialist staff and developing skills for planning and collaboration in the R&D process. Small and medium sized enterprises usually report more behavioural effects than larger companies.

¹² The total granted tax reduction on the R&D wage bill for withholding agents is on average EUR 0.80 billion a year in the period 2011-2017. Only the withholding agents are included in this calculation, because the econometric analyses just apply to them. The total annual WBSO costs are therefore higher.

¹³ This is the R&D wage bill that is not supported due to the ceiling in the years 2011 to 2015.

18. According to the survey results (and in line with the rationale) the WBSO helps with R&D investments that companies find more difficult to realise themselves. Participants indicate that their R&D efforts that rely on the WBSO generate more spillovers. Moreover, the survey suggests that the WBSO not only produces spillovers but also helps to exploit them.
19. For those companies that focus or consider focussing their R&D on an international scale – by definition this is a limited number of the WBSO users – the WBSO can help lower their effective tax burden, a major (but not the only) condition for a favourable R&D business climate.

Conclusions regarding efficiency

20. We consider the WBSO is a cost-efficient scheme. Per euro of lost tax revenue as a result of the WBSO, the annual execution costs – mostly for RVO.nl – average about 2 euro cents over the evaluation period. After the integration of the RDA in 2016 and 2017, execution costs were lower.
21. The majority of the WBSO users is satisfied with the various aspects of the implementation. There is however room for improvement, especially the processing time after submitting an application.
22. The proportion of WBSO users employing the services of an intermediary has risen further during the evaluation period (from 79% in 2011, to 85% of the withholding agents in 2017 and 60 to 70% of the self-employed).
23. The WBSO's estimated administrative burden (the sum of intermediary efforts and its own administration costs) in 2017 is probably higher than estimated at the end of the previous evaluation period (8% of the WBSO budget). All the companies reported their own costs as being roughly between 4.4% and 7% of the allocated WBSO budget in 2017. The estimated costs for intermediary efforts are 3.8% of the allocated budget. The costs for intermediaries have risen slightly since the previous evaluation period, considering these still amounted to 3.3% in 2010. Surprisingly, companies' own costs are higher if they use intermediaries.

Based on these findings, we have drawn up 12 recommendations. These mostly concern the development of an R&D tax credit scheme like the WBSO as well as several practical ideas for improving how to reach the target group, the set-up and operation of the WBSO. We also advocate implementing policy experiments within the WBSO in the future to test on a small scale whether adjustments to the scheme are effective (see section 6.3).



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