SR&ED
International R&D Tax Credit Strategies

On overview of Research & Development (R&D) project management & tax credit claims.

Contents

International R&D Tax Credits

Often companies perform eligible research in several countries.

A detailed review of the government funding methods in most countries illustrates that almost all countries use a similar definition of the R&D project and thus the eligible activities.

History of the international definition

The **Frascati Manual** is a document setting forth the methodology for collecting statistics about research and development. The Manual was prepared and published by the Organisation for Economic Co-operation and Development (OECD).

In June 1963, OECD experts met with the NESTI group (National Experts on Science and Technology Indicators) at the Villa Falconieri in Frascati, Italy. Since then it has been revised several times. In 2002 the 6th edition was published.

The manual sets forth fundamental definitions for: basic research, applied research, and research & development. It also organizes Fields of science into main and sub-categories.

Over the past 40 years, the NESTI group has developed a series of documents, known as "Frascati Family", which includes manuals on:

- R&D (Frascati Manual),
- innovation (Oslo Manual),
- human resources (Canberra Manual),
- technology balance of payments and patents as science and technology indicators.

Originally an OECD standard, it has become an acknowledged standard in R&D studies all over the world and is widely used by various organisations associated with the United Nations and European Union.

Three forms of research

The Frascati Manual outlines three forms of research. These are basic research, applied research and experimental development:[1]

1. **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, **without any particular application or use in view**.

2. **Applied research** is also original investigation undertaken in order to acquire new knowledge but **directed towards a specific practical aim or objective**.

3. **Experimental development** is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing **new materials, products or devices**, to installing new processes, systems and services, or to improving substantially those already produced or installed.

Definition of Qualified Activities via Eligible Projects (Scientific Method)

"For a … project to be classified as R&D, its completion must be dependent on a scientific &/or **technological advance**, the aim of the project must be the **systematic resolution** of a scientific and/or **technological uncertainty**."[1]

[1] Frascati Manual 2002 paragraph 135

Phase 0: Defining Eligible Fields of Science or Technology

Fields of science - OECD classifications 2007

1. Natural Sciences	1.1 Mathematics 1.2 Computer and information sciences 1.3 Physical sciences 1.4 Chemical sciences 1.5 Earth and related environmental sciences 1.6 Biological sciences 1.7 Other natural sciences	**ELIGIBLE for R&D tax credits**
2. Engineering & Technology	2.1 Civil engineering 2.2 Electrical engineering, electronic engineering, information engineering 2.3 Mechanical engineering 2.4 Chemical engineering 2.5 Materials engineering 2.6 Medical engineering 2.7 Environmental engineering 2.8 Environmental biotechnology 2.9 Industrial Biotechnology 2.10 Nano-technology 2.11 Other engineering and technologies	
3. Medical & Health Sciences	3.1 Basic medicine 3.2 Clinical medicine 3.3 Health sciences 3.4 Health biotechnology 3.5 Other medical sciences	
4. Agricultural Sciences	4.1 Agriculture, forestry, and fisheries 4.2 Animal and dairy science 4.3 Veterinary science 4.4 Agricultural biotechnology 4.5 Other agricultural sciences	
5. Social Sciences	5.1 Psychology 5.2 Economics and business 5.3 Educational sciences 5.3 Sociology 5.5 Law 5.6 Political Science 5.7 Social and economic geography 5.8 Media and communications 5.7 Other social sciences	**NOT ELIGIBLE for R&D tax credits**
6. Humanities	6.1 History and archaeology 6.2 Languages and literature 6.3 Philosophy, ethics and religion 6.4 Art (arts, history of arts, performing arts,music) 6.5 Other humanities	

Phase 1: Objectives Beyond "Standard Practice"

A) Define industry "standard practice"

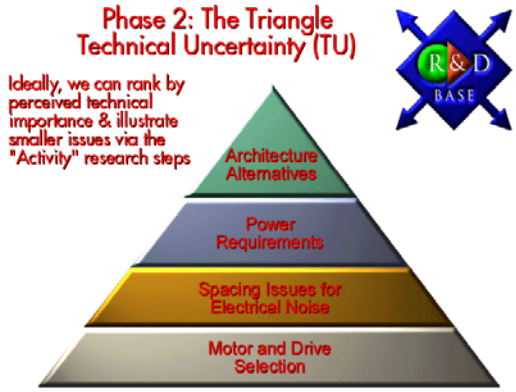
"The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty,

i.e. when the solution to a problem is **not readily apparent to someone familiar with the basic stock of common knowledge** and techniques for the area concerned."[2]

B) Technological objective beyond standard practice

"…. If the primary objective is to make **further technical improvement** on the product or process then the work comes within the definition of R&D ……. if the primary objective is to develop markets, to do preproduction's planning or control system working smoothly, then the work is no longer R&D." [3]

Phase 2: Variables of Technological Uncertainty



"The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of **scientific and/or technological uncertainty**,

i.e. when the solution to a problem is not readily apparent to someone familiar with the basic stock of common knowledge and techniques for the area concerned."[4]

The paper includes some supplementary criteria for distinguishing R&D:

- What is new or innovative about this project?
- Is it seeking previously undiscovered phenomena, structures or relationships?
- Does it apply knowledge or techniques in a new way?
- Is there a significant chance that it will result in new (extended or deeper) understanding of phenomena,
- relationships or manipulative principles of interest to more than one organization
- Are the results expected to be patentable?

[2] Frascati Manual 2002 paragraph 84
[3] Frascati Manual (2002) proposed standard practice for survey on research and experimental development Paragraph 111
[4] Frascati Manual 2002 paragraph 84

Phase 3: Process of "Systematic" Experimentation

"Research and experimental development is **creative work undertaken systematically** to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications."[5]

Research has been defined in a number of different ways. "In the broadest sense of the word, the definition of research includes **any gathering of data, information and facts for the advancement of knowledge."**[6]

Generally, research is understood to follow a certain structural process including[7]:

- Observations and Formation of the Objective
- Hypothesis: A testable prediction which designates the relationship between two or more variables.
- Gathering, Analysis & Interpretation of data
- Test, revising of hypothesis
- Conclusion, reiteration if necessary

Implications to R&D Tax Credit Claimants:

The Project Template

(next page)

The Frascati directives and requirements indicate the following project documentation methodology:

- If researcher teams can compile this information,
- they should be able to claim related tax credits,
- in ANY related country.
- Examples of completed R&D projects by country are available at www.rdbase.net

Notable quote:

"They always say time changes things, but you actually have to change them yourself."

- Andy Warhol

[5] (OECD (2002) Frascati Manual: proposed standard practice for surveys on research and experimental development, 6th edition
[6] Wikipedia definition of "Research"
[7] Wikipedia definition of "Scientific Method"

Putting it all together – The Project Template

Overview of requirements

RDBASE.NET International SR&ED template

I		**OBJECTIVE BEYOND STANDARD PRACTICE**	**Recommended documentation**	**GOAL: prove to Government (CRA, IRS, patent office)**
	i)	**State of Existing technology**	State benchmarking methods & sources	Limits of information available to someone "skilled in the art."
	ii)	**Objective(s)**	Top 5 measureable "Objectives"	Quantifiable Objectives beyond known limits
II		**TECHNOLOGICAL UNCERTAINTIES**	Top 5 "Variables" for experimentation	Formulate "test matrix" to test hypotheses
III		**EXPERIMENTAL ACTIVITY**	Defined by tax year*	
	i)	**Experimentation method**	Number of alternatives tested & how?	Justify sample sizes
	ii)	**Results**	Correlate to "Objectives"	Provide basis for Conclusions
	iii)	**Conclusions**	Correlate to "Variables"	"New knowledge" illustrates "Technological Advancement"

Detailed template of all required information

RDBASE.NET template for claiming tax credits internationally

I PROJECT OBJECTIVE BEYOND STANDARD PRACTICE:

GOAL is to prove to Government (CRA, IRS, etc.) :

i) State of Existing technology: Benchmarking methods & sources

Technology limits of "readily available" information to someone "skilled in the art."

		Number (#) of	
i	Internet / Google Searches		internet sites
ii	Articles		articles
iii	Patent searches		patents
iv	Competitive methods		products / processes
v	In-house technologies		products / processes
vi	Potential components		products
vii	Queries to experts		responses
viii	Other		

ii) Objective(s)

Quantifiable Objectives beyond known limits

		Performance benchmarks (top 5)*	
		Benchmark 1	Benchmark 2
i	Existing benchmark		
ii	Units of measure		
iii	Performance objective		
iv	*Result (III below)**		

II TECHNOLOGICAL UNCERTAINTIES

Using "science" to formulate hypotheses & experiments

	Variables for experimentation (top 5)**	
	Variable 1	Variable 2
Name of variable		

III EXPERIMENTAL ACTIVITY

*Defined by tax year**

i) Experimentation method

Justify sample sizes via "variables"

		Number of		
i	Analysis / simulation		alternatives	*Quickest*
ii	Process trials		runs / samples	*Longer*
iii	Prototypes		samples	*Longest*
	protoype revisions		revisions	

ii) Analysis

i	Results	* vs. Objectives I	*Identify the unexpected*
ii	Conclusions	** on Variables II	*Attempt understand "why?"*
iii	Documentation	Experiments/Analysis	*Proof experiments & costs*

iii) Direct Costs

i	Wages		Hours / Employee	* *PROJECTS span multiple years but ACTIVITIES match tax years.*
ii	Contractors		Labour $ / Contractor	
iii	Materials		Consumed/transformed	

Comparing R&D Funding by Country[8]

If we want to make a rough comparison of funding by industrialized countries we can use a ration named the "Beta Index" (B-Index).

It is calculated as:

> After tax cost of $1 of R&D / (1- tax rate)

Simply stated:

> B-Index is the before-tax income needed to break even on one dollar of R&D spent.

The **lower** the B-Index the more **favorable** it is for a company to perform R&D in a particular country.

If we use Canada as an example we can see if has one of the lowest B-Indices however, **many countries provide other "direct" funding** instead of "tax incentives."

The OECD report provides a further comparison of the total % of "Business Expenditures on Research & Development" (BERD) which are financed by the government (next page).

Comparing the value of B-indexes 2002

(manufacturing companies, by country)

Country	Large company	Small company
Australia	0.801	0.801
Austria	0.875	0.875
Belgium	1.009	1.006
Canada	**0.827**	**0.678**
Denmark	0.893	0.893
Finland	1.01	1.01
France	0.939	0.939
Germany	1.025	1.025
Greece	1.015	1.015
Iceland	1.012	1.012
Ireland	1	1
Italy	1.026	0.557
Japan	0.991	0.879
Korea	0.874	0.821
Mexico	0.969	0.969
Netherlands	0.901	0.647
New Zealand	1.023	1.023
Norway	1.018	0.768
Portugal	0.665	0.665
Spain	0.559	0.559
Sweden	1.015	1.015
Switzerland	1.01	1.01
United Kingdom	0.904	0.894
United States	0.934	0.934

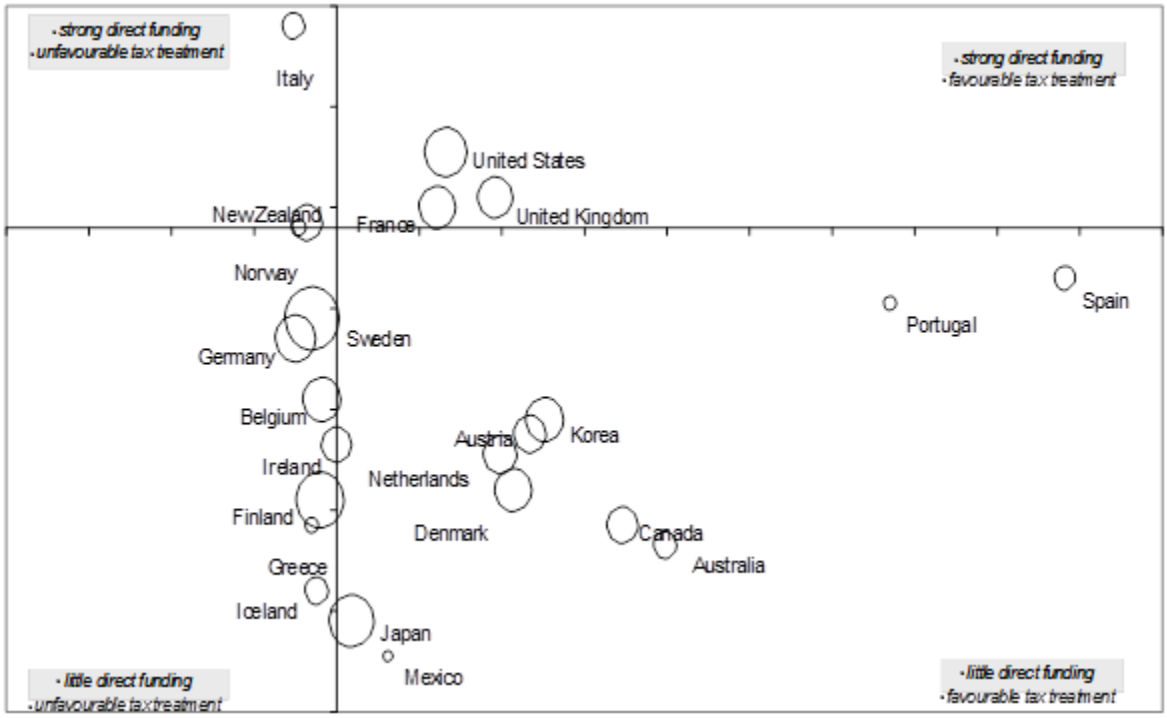
Notable quote:

"He who asks a question is a fool for 5 minutes.
He who does not ask a question remains a fool forever."

- Chinese proverb

[8] Tax Incentives for Research and Development: Trends and Issues, OECD, 2002

Government funding of business (OECD)
Direct (Grants) vs. Indirect (Tax Credits)



Authors Analysis & commentary:

This table indicates that certain governments like Australia & Canada finance approximately 4% of total business research whereas most other countries are significantly higher (e.g France, US & UK are all >10%).

The next page provides a comparison of the funding provided directly (grants & contracts) vs. indirectly (tax credits).

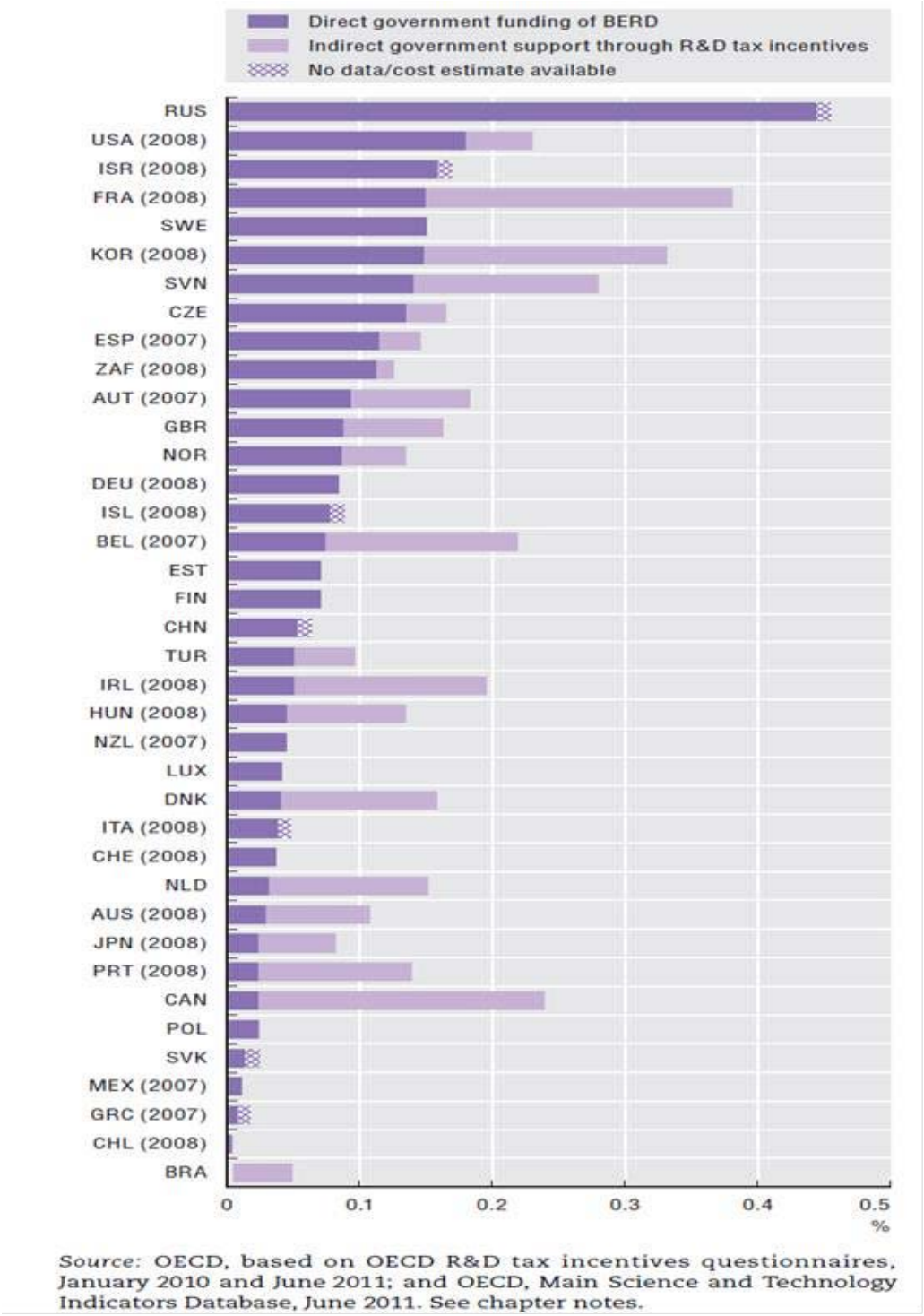
NOTE: These balances **do NOT** include "military & defence" related R&D spending.

Notable quote:

"The best way to have a good idea is to have a lot of ideas."

- Dr. Linus Pauling

Government Funding of Business R&D - Direct vs. Tax Credits[9]



Source: OECD, based on OECD R&D tax incentives questionnaires, January 2010 and June 2011; and OECD, Main Science and Technology Indicators Database, June 2011. See chapter notes.

[9] OECD SCIENCE, TECHNOLOGY AND INDUSTRY SCOREBOARD 2011 © OECD 2011

Questions or feedback

We welcome your questions or feedback on any issues raised in this letter.

We also encourage interested parties to examine:

- Past SR&ED newsletters
- SR&ED tax guide [the Guide to RDBASE.NET],
- RDBASE.NET online SR&ED tracking software &
- Additional tutorials re. eligible SR&ED activities at

www.RDBASE.net

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