

# World - Innovation and Development around the World 1960-2000

**Daniel Lederman and Laura Saenz - World Bank**

Report generated on: November 20, 2013

Visit our data catalog at: <http://microdata.worldbank.org>



# Sampling

No content available

# Questionnaires

No content available

## Data Collection

### Data Collection Dates

---

<b>Start</b>	<b>End</b>	<b>Cycle</b>
1960	2000	N/A

### Time Periods

---

<b>Start</b>	<b>End</b>	<b>Cycle</b>
1960	2000	N/A

### Data Collection Mode

---

Other [oth]

# Data Processing

No content available

# Data Appraisal

No content available

# File Description

# Variable List

## Innovation\_and\_Development\_Database

Content	The data include measures of innovation outcomes as well as variables related to innovation effort. The main indicator of innovation outputs is patents. The main variables related to innovation inputs are investment in research and development (R&D) and technical personnel (engineers, scientists) working in R&D activities. The sources of these data are publicly available (OECD, UNESCO, etc.), yet there have been few attempts at double checking the consistency of these data and digitizing observations dating back to the 1960s.
Cases	8295
Variable(s)	33
Structure	Type: Keys: ()
Version	
Producer	
Missing Data	

## Variables

ID	Name	Label	Type	Format	Question
V1	country	Country	discrete	character	
V2	code	Country code	discrete	character	
V3	year	Year	discrete	numeric	
V4	eap	East Asia and the Pacific	discrete	numeric	
V5	eca	Europe and Central Asia	discrete	numeric	
V6	lac	Latin America and the Caribbean	discrete	numeric	
V7	mena	Middle East and North Africa	discrete	numeric	
V8	sha	Sub-Saharan Africa	discrete	numeric	
V9	sa	South Asia	discrete	numeric	
V10	hi	High income	discrete	numeric	
V11	pat	Total patents granted by the USPTO by year for each country	contin	numeric	
V12	patepo	Total patents granted by the EPO by year for each country	contin	numeric	
V13	royal	Royalties and license fees, payments	contin	numeric	
V14	rdexp	R&D expenditure	contin	numeric	
V15	rdper	R&D personnel	contin	numeric	
V16	rdfinabro	R&D expenditure financed with funds from abroad	contin	numeric	
V17	rdfinprod	R&D expenditure financed by the productive sector	contin	numeric	
V18	rdperfprod	R&D expenditure performed by the productive sector	contin	numeric	
V19	rdperfhe	R&D expenditure performed by higher education	contin	numeric	
V20	rdperfpub	R&D performed by the public sector	contin	numeric	
V21	lowrdexp		discrete	numeric	
V22	lowrdfinprod		discrete	numeric	
V23	lowrdperfprod		discrete	numeric	
V24	y		contin	numeric	
V25	stockpatepo	Stock of patents granted by the EPO	contin	numeric	

<b>ID</b>	<b>Name</b>	<b>Label</b>	<b>Type</b>	<b>Format</b>	<b>Question</b>
V26	poptotal		contin	numeric	
V27	labor		contin	numeric	
V28	rdexpgdp	R&D expenditure as percentage of G.D.P.	contin	numeric	
V29	patgrantedstock		contin	numeric	
V30	plantpatstock		contin	numeric	
V31	designpatstock		contin	numeric	
V32	plantpat		contin	numeric	
V33	designpat		contin	numeric	



## Country (country)

### File: Innovation\_and\_Development\_Database

**Overview**

Type: Discrete	Valid cases: 8295
Format: character	Invalid: 0
Width: 30	

## Country code (code)

### File: Innovation\_and\_Development\_Database

**Overview**

Type: Discrete	Valid cases: 8295
Format: character	Invalid: 0
Width: 3	

## Year (year)

### File: Innovation\_and\_Development\_Database

**Overview**

Type: Discrete	Valid cases: 8295
Format: numeric	Invalid: 0
Width: 4	Minimum: 1960
Decimals: 0	Maximum: 2002
Range: 1960-2002	

## East Asia and the Pacific (eap)

### File: Innovation\_and\_Development\_Database

**Overview**

Type: Discrete	Valid cases: 8295
Format: numeric	Invalid: 0
Width: 1	
Decimals: 0	
Range: 0-1	

## Europe and Central Asia (eca)

### File: Innovation\_and\_Development\_Database

**Overview**

Type: Discrete	Valid cases: 8295
Format: numeric	Invalid: 0
Width: 1	
Decimals: 0	
Range: 0-1	

## Latin America and the Caribbean (lac)

### File: Innovation\_and\_Development\_Database

**Overview**

## Latin America and the Caribbean (lac)

### File: Innovation\_and\_Development\_Database

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-1

Valid cases: 8295  
 Invalid: 0

## Middle East and North Africa (mena)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-1

Valid cases: 8295  
 Invalid: 0

## Sub-Saharan Africa (sha)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-1

Valid cases: 8295  
 Invalid: 0

## South Asia (sa)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-1

Valid cases: 8295  
 Invalid: 0

## High income (hi)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-1

Valid cases: 8294  
 Invalid: 1

## Total patents granted by the USPTO by year for each country (pat)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Continuous	Valid cases: 7132
Format: numeric	Invalid: 1163
Width: 5	Minimum: 0
Decimals: 0	Maximum: 87607
Range: 0-87607	Mean: 478.6
	Standard deviation: 4195

#### Description

Patent by USPTO: Property right granted by the Government of the United States of America to an inventor "to exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States" for a limited time in exchange for public disclosure of the invention when the patent is granted.

#### Source of information

U.S. Patent & Trademark Office

## Total patents granted by the EPO by year for each country (patepo)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Continuous	Valid cases: 3114
Format: numeric	Invalid: 5181
Width: 5	Minimum: 0
Decimals: 0	Maximum: 10300
Range: 0-10300	Mean: 173.5
	Standard deviation: 937.4

#### Description

Patent by EPO: Legal title granting its holder the exclusive right to make use of an invention for a limited area and time by stopping others from, amongst other things, making, using or selling it without authorization. A European patent can be obtained by filing a single application in one of the official languages of the European Patent Office (English, French or German) in a unitary procedure before the EPO and is valid in as many of the contracting states as the applicant cares to designate. A European patent affords the same rights in the designated contracting states as a national patent granted in any of these states.

#### Source of information

European Patent Office

## Royalties and license fees, payments (royal)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Continuous	Valid cases: 2382
Format: numeric	Invalid: 5913
Width: 11	Minimum: 0
Decimals: 0	Maximum: 16400000000
Range: 0-16400000000	Mean: 319475495.9
	Standard deviation: 1168250143.1

#### Source of information

World Development Indicators through World Bank electronic databases

## R&D expenditure (rdexp)

### File: Innovation\_and\_Development\_Database

#### Overview

## R&D expenditure (rdexp)

### File: Innovation\_and\_Development\_Database

Type: Continuous	Valid cases: 1395
Format: numeric	Invalid: 6900
Width: 12	Minimum: 5161.2
Decimals: 0	Maximum: 243000000000
Range: 5161.2-243000000000	Mean: 9501998412.8
	Standard deviation: 28847009139.8

#### Description

Research and experimental development (R&D)

In general R&D is defined as any creative systematic activity undertaken in order to increase the stock of knowledge, including knowledge of man, culture, and society, and the use of this knowledge to devise new applications. It includes fundamental research, applied research, and experimental development.

Fundamental Research: Any activity directed towards the increase of scientific knowledge or discovery of new fields of investigation, without any specific practical objective.

Applied research: Any activity directed towards the increase of scientific knowledge but with a specific practical aim in view.

Experimental development: Systematic use of the results of fundamental and applied research and of empirical knowledge directed towards the introduction of new materials, products, devices, processes and methods, or the improvement of existing ones, including the development of prototypes and pilot plants.

R&D Investment :The measurement of R&D investment is calculated on the basis of intramural current expenditure, including overheads, and intramural capital expenditure. The sum of the intramural expenditures incurred by the national institutions provides the total domestic expenditure which is the information presented at the international level. Total domestic expenditure on R&D activities refers to all expenditure made for this purpose in the course of a reference year in institutions and installations established in the national territory as well as installations physically situated abroad. The total expenditure for R&D as defined above comprises current expenditure, including overheads, and capital expenditure.

#### Source of information

UNESCO:printed and electronic versions of Statistical Yearbook.

## R&D personnel (rdper)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Continuous	Valid cases: 1313
Format: numeric	Invalid: 6982
Width: 7	Minimum: 0
Decimals: 0	Maximum: 1522200
Range: 0-1522200	Mean: 77215.1
	Standard deviation: 194692.5

#### Description

R&D personnel corresponds to scientists and engineers, comprising persons working in those capacities, i.e. as persons with scientific or technological training (usually completion of third level education) in any field of science, who are engaged in professional work on R&D activities, administrators and other high-level personnel who direct the execution of R&D activities.

#### Source of information

- OECD: Science and Technology Indicators in electronic and printed format
- RICYT
- Taiwan (China) Statistical Data book

## R&D expenditure financed with funds from abroad (rdfinabro)

### File: Innovation\_and\_Development\_Database

#### Overview

## R&D expenditure financed with funds from abroad (rdfinabro)

### File: Innovation\_and\_Development\_Database

Type: Continuous	Valid cases: 894
Format: numeric	Invalid: 7401
Width: 3	Minimum: 0
Decimals: 0	Maximum: 100
Range: 0-100	Mean: 5.4
	Standard deviation: 10.6

#### Description

Foreign funds are funds received from abroad for national R&D activities.

#### Source of information

- UNESCO Statistical Yearbooks (electronic and printed formats)
- OECD Main Science and Technology indicators
- RICYT
- Taiwan (China) Statistical Data book

## R&D expenditure financed by the productive sector (rdfinprod)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Continuous	Valid cases: 1111
Format: numeric	Invalid: 7184
Width: 16	Minimum: 0
Decimals: 0	Maximum: 94.7
Range: 0-94.6999969482422	Mean: 41.2
	Standard deviation: 21.5

#### Description

The productive sector includes both domestic and foreign-owned industrial and trading establishments located in the country, which produce and distribute goods and services for sale, and organizations directly serving them, whatever their form of ownership, private, non-profit, or government. It also includes government monopolies and nationalized industries, particularly public utilities, transport undertakings, post offices, communications and broadcasting, and all other government establishments which function as productive units. Also included are governmental or non-governmental organizations and private non-profit institutions mainly or exclusively serving industrial or trading establishments, except those institutes, experimental stations, etc., operating under the direct control of, or being associated with institutions of higher education. In former socialist countries, R&D institutes of branch ministries were classified in this sector.

#### Source of information

- UNESCO Statistical Yearbooks (electronic and printed formats)
- OECD Main Science and Technology indicators (electronic and printed formats)
- RICYT
- Taiwan (China) Statistical Data book
- Database developed by Furman et al.

## R&D expenditure performed by the productive sector (rdperfprod)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Continuous	Valid cases: 850
Format: numeric	Invalid: 7445
Width: 3	Minimum: 0
Decimals: 0	Maximum: 100
Range: 0-100	Mean: 51.2
	Standard deviation: 21.2

#### Source of information

- UNESCO Statistical Yearbooks
- OECD Main Science and Technology indicators
- RICYT
- Taiwan (China) Statistical Data book

## R&D expenditure performed by higher education (rdperfhe)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Continuous	Valid cases: 992
Format: numeric	Invalid: 7303
Width: 16	Minimum: 0
Decimals: 0	Maximum: 77.7
Range: 0-77.6999969482422	Mean: 21.7
	Standard deviation: 12.7

#### Description

The higher education sector relates to establishments of education at the third level and also includes those research institutes, experimental stations, etc, serving them.

#### Source of information

- UNESCO Statistical Yearbooks
- OECD Main Science and Technology indicators
- RICYT
- Taiwan (China) Statistical Data book
- Database developed by Furman et al.

## R&D performed by the public sector (rdperfpub)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Continuous	Valid cases: 845
Format: numeric	Invalid: 7450
Width: 3	Minimum: 0
Decimals: 0	Maximum: 100
Range: 0-100	Mean: 27.3
	Standard deviation: 19.2

#### Description

The public sector, or general service sector, includes various public or government establishments serving the community as a whole.

#### Source of information

- UNESCO Statistical Yearbooks
- OECD Main Science and Technology indicators
- RICYT

## (lowrdexp)

### File: Innovation\_and\_Development\_Database

#### Overview

Type: Discrete	Valid cases: 177
Format: numeric	Invalid: 8118
Width: 1	
Decimals: 0	
Range: 1-1	

## (lowrdfinprod)

### File: Innovation\_and\_Development\_Database

#### Overview

(lowrdfinprod)

## File: Innovation\_and\_Development\_Database

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-1

Valid cases: 6392  
 Invalid: 1903

(lowrdperfprod)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Discrete  
 Format: numeric  
 Width: 1  
 Decimals: 0  
 Range: 0-1

Valid cases: 6392  
 Invalid: 1903

(y)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous  
 Format: numeric  
 Width: 13  
 Decimals: 0  
 Range: 291000000-901000000000

Valid cases: 4174  
 Invalid: 4121  
 Minimum: 291000000  
 Maximum: 901000000000  
 Mean: 185654029947.3  
 Standard deviation: 676050303281.3

Stock of patents granted by the EPO (stockpatepo)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous  
 Format: numeric  
 Width: 6  
 Decimals: 0  
 Range: 0-122157

Valid cases: 3114  
 Invalid: 5181  
 Minimum: 0  
 Maximum: 122157  
 Mean: 1470.7  
 Standard deviation: 9137.9

**Source of information**

Author's calculations

(poptotal)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous  
 Format: numeric  
 Width: 10  
 Decimals: 0  
 Range: 500920-1270000000

Valid cases: 6543  
 Invalid: 1752  
 Minimum: 500920  
 Maximum: 1270000000  
 Mean: 28883877.5  
 Standard deviation: 101642484.6

(labor)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous	Valid cases: 5226
Format: numeric	Invalid: 3069
Width: 9	Minimum: 72589
Decimals: 0	Maximum: 862210000
Range: 72589-862210000	Mean: 19789715.1
	Standard deviation: 68176401.1

R&amp;D expenditure as percentage of G.D.P. (rdexpgdp)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous	Valid cases: 1390
Format: numeric	Invalid: 6905
Width: 20	Minimum: 0
Decimals: 0	Maximum: 4.4
Range: 0.000176899993675761-4.39919900894165	Mean: 1
	Standard deviation: 0.8

(patgrantedstock)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous	Valid cases: 7424
Format: numeric	Invalid: 871
Width: 7	Minimum: 0
Decimals: 0	Maximum: 1957665
Range: 0-1957665	Mean: 7329.7
	Standard deviation: 78622.2

(plantpatstock)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous	Valid cases: 4762
Format: numeric	Invalid: 3533
Width: 4	Minimum: 0
Decimals: 0	Maximum: 4843
Range: 0-4843	Mean: 17.8
	Standard deviation: 193.3

(designpatstock)

## File: Innovation\_and\_Development\_Database

**Overview**

(designpatstock)

## File: Innovation\_and\_Development\_Database

Type: Continuous	Valid cases: 4762
Format: numeric	Invalid: 3533
Width: 6	Minimum: 0
Decimals: 0	Maximum: 141143
Range: 0-141143	Mean: 416.8
	Standard deviation: 5017.6

(plantpat)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous	Valid cases: 4747
Format: numeric	Invalid: 3548
Width: 3	Minimum: 0
Decimals: 0	Maximum: 518
Range: 0-518	Mean: 2
	Standard deviation: 17.8

(designpat)

## File: Innovation\_and\_Development\_Database

**Overview**

Type: Continuous	Valid cases: 4747
Format: numeric	Invalid: 3548
Width: 5	Minimum: 0
Decimals: 0	Maximum: 11285
Range: 0-11285	Mean: 47.3
	Standard deviation: 479.7

## Related Materials

### Reports

#### Innovation and Development around the World, 1960-2000

---

Title Innovation and Development around the World, 1960-2000

Author(s) Daniel Lederman Laura Saenz

Date 2005-11-01

Language English

Description This paper presents a database of indicators of innovative activity around the world since the early 1960s. The data include measures of innovation outcomes as well as variables related to innovation effort. The main indicator of innovation outputs is patents. The main variables related to innovation inputs are investment in research and development (R&D) and technical personnel (engineers, scientists) working in R&D activities. The sources of these data are publicly available (OECD, UNESCO, etc.), yet there have been few attempts at double checking the consistency of these data and digitizing observations dating back to the 1960s. After discussing the sources and definitions of the data, the paper examines trends and patterns of innovation outputs and inputs by looking at the over-time behavior of the relevant series and comparing the performance of developing and high-income countries. The authors also provide cross-regional comparisons and a detailed examination of trends in selected countries. In turn, the authors provide estimates of the impact of innovation on long-run development by following an emerging empirical literature on the determinants of levels of GDP per capita. The econometric results suggest that innovation might indeed have strong positive effects on long-run development, which might be stronger than the direct effects of institutions. The analysis pays close attention to issues related to the potential endogeneity of innovation (and institutions) with respect to the level of development.

Filename Doc/Reports/wps3774.pdf

---

### Other materials

#### Excel to Stata Conversion Program (Stata 10)

---

Title Excel to Stata Conversion Program (Stata 10)

Author(s) Development Data Group (DECDG), World Bank

Language English

Description Before running this program the excel format data should be saved as csv format.

Filename Programs/ID\_data\_conversion.do

---