

**A Comparative Study of Environmental
Expenditure in the
European Union and Latin America.
Cases of Germany, Brazil and Argentina**

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General Target

To evaluate the importance of the economies related to the environmental problems resolution, one of the key variables to analyze is the amount of resources that those economies use for that purpose. These monetary items are the manifestation of the importance of the environment in the agendas of each actor of the economy.

General target: to carry a comparative analysis of environmental expenditure in Germany, Brazil and Argentina, as part of the economic blocks to which these economies belong (EU and LA).



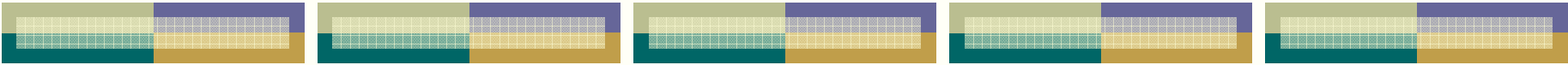


For it, was discussed:


- The scope of the main methodologies used for the estimation of environmental expenditure
- The building comparable series of environmental expenditure for Germany, Brazil and Argentina, with the aim of analyzing their symmetries and asymmetries in absolute and relative terms (their participation in the GDP, the share of each item of expenditure, the function of expenditure, its nature, and the sector responsible for the expense).

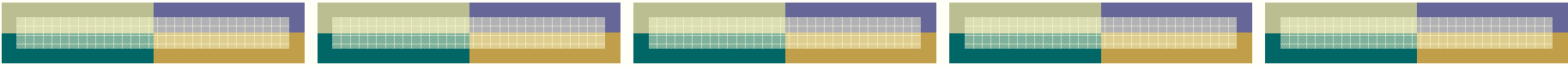
The study will focused only on the perspective of the public sector (it was excluded the contributions being made by the private sector in the economy)






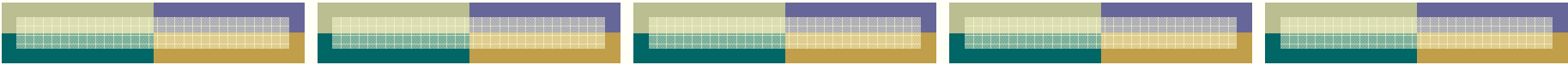
Methodologies used for the estimation of environmental expenditure

- Pollution Abatement and Control Expenditure- PACE- of the Organization for Economic Cooperation and Development
 - The System of Environmental and Economic Accounts – SEEA, developed by the United Nations Organization
 - The European System for the Collection of Economic Information on the Environment-SERIEE implemented by Eurostat
 - The experience of countries such as Denmark, Canada and Australia which have developed accounting systems
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PACE: Pollution Abatement and Control Expenditure OCDE (1998) (I)

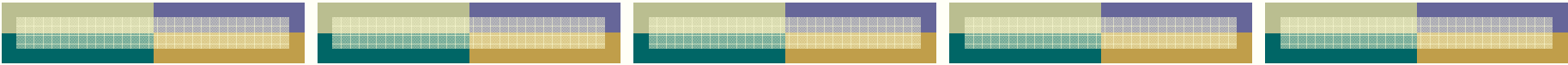
- **Definition:** Spending on environmental protection and control is defined as all those activities directly related to the prevention, reduction and elimination of pollution or nuisance caused by residual production processes
 - **Objective:** To define activities as protection of the environment (water, land, air, etc.), depending on the nature of expenditure (consumer goods or capital goods) and by the function (prevention, control, mitigation, etc.)
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PACE: Pollution Abatement and Control Expenditure OCDE (1998) (II)


● **Reach:** Accounts whose aim is strictly environmental. Excludes resources allocated to natural resource management, to the activities of species protection, management and protection of ecosystems and security that influences the production processes of economic activity, and the cost of research, development of new technologies, and training and environmental education. Establishes guidelines for quantifying the "flow" cross to identify the level of mitigation performed by each agent (abater principle), as well as to estimate the financial burden for each sector (financer principle). Suggests building statistics flows for current expenses or capital formation incurred in the sectors

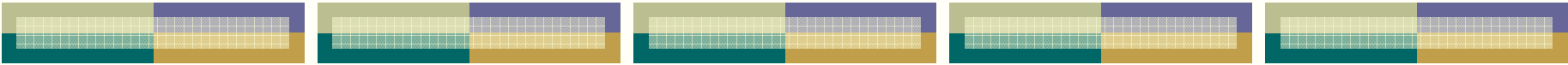





SEEA: System of Environmental and Economic Accounts

World Bank (1994)

- **Definition:** The environmental spending is defined on the basis of the standard Environmental Expenditure rating (CEPA) EUROSTAT
 - **Objective:** To provide a mechanism for organizing information in physical and monetary terms and also to enable the construction of indicators to assess and formulate public policies in the context of sustainable development
 - **Reach:** Develops the necessary adjustments to the monetary aggregates (GDP) to reflect environmental costs. Includes spending on protection Environmental and derivatives resource management. Generates macroeconomic indicators (adjusted GDP) according to spending on the environmental protection being made by many sectors. Differentiates environmental assets and the economic assets, and physical flows of assets and environmental pollution emissions
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SERIEE: European System for the Collection on Economic Information on Environment. UE

- **Definition:** Environmental protection constitutes all the actions and activities that aim at the prevention, reduction and elimination of pollution or other environmental degradation
 - **Objective:** To build a procedures manual that seeks to estimate the monetary flows related to environmental protection, and to characterize the impact on the economy at national and regional levels, besides trying to build indicators.
 - **Reach:** Part of agreed criteria for the valuation and description of the resources allocated for environmental protection, for classification and identification of the areas that absorb the cost. Quantifies the market for environmental protection. It includes the consumption of goods and services and activities that aim to prevent, reduce, reverse or mitigate the volume of pollutant emissions and / or the risk of contamination, monitoring and control, waste collection, treatment services, research and development of new technologies, training and environmental education, and activities related to biodiversity and natural resources.
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EPEA: Environmental Protection Expenditure

Account Australia (1990-91)


- **Definition:** Uses methodologies OECD and SERIEE but with a broader definition than the OECD
 - **Objective:** To develop a statistical system that can provide high-level decision makers with enough information, and elements to evaluate and develop policies, legislation, markets and economic instruments of environmental policy. It includes all levels of government, industry and household items. To analyze the efficiency of environmental expenditure-ecoefficiency
 - **Reach:** It measures environmental spending, identifies and quantifies the responses of different sectors to regulation and environmental policy. It incorporates environmental information relevant to the economic accounts. It serves as a benchmark to compare the amount of the national effort in relation to international action
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European Union

The UE's expenditure environment analysis can be done from their two major components: the spendings incurred in pollution control and reduction, and the research and development budget for environmental protection. The information available allows us to analyse the situation for the members of European Union countries. In this context, Germany's case is dealt with.

Germany Case

- The Germany's public sector, as well as Denmark's, shows the major financial efforts directed to pollution abatement and control, with percentages of GNP environmental expenditure between 1.2 and 1.4%.
 - The public sector expenditure in Germany shows that the environmental expenditure decreased in the 2000s' by 1,30 and 1,14, in terms of GDP while, Germany has spent an average of 300 USD per capita for environmental expenditure for 2000's.
 - The public sector expenditure in Germany shows over the years 2000 two different shares. About one third of environmental expenditure is allocated to environmental protection (expenses environment, nature protection and environmental security costs), while two thirds are spent in housing costs and community services (including expenses as support for the agricultural sector, spending on energy and water management).
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PUBLIC SECTOR'S POLLUTION ABATEMENT AND CONTROL (PAC) EXPENDITURE. UE. (1990 - 2004)

PAC Expenditure, % of GDP															
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Austria	1,1	1,1	1,1	1,2	0,9	1,4	1,3	1,4	1,5	1,3	0,9	1,1			
Belgium							0,5	0,5					0,5		
Czeck				0,5	0,8	0,7	0,7	0,7	0,5	0,5	0,5	0,5	0,3		
Denmark		1,3	1,3	1,4	1,3	1,3	1,3	1,4	1,4	1,4	1,4	1,4	1,4	1,4	1,3
Finland				0,7	0,6	0,5	0,6	0,6	0,5	0,5	0,5				
France	0,5					0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6		
Germany		0,9	0,9	0,9	1,4	1,5	1,5	1,4	1,3	1,3	1,3	1,2	1,3	1,3	
Greece		0,7	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5					
Hungary			0,2	0,3	0,6	0,4	0,3	0,2	0,5			0,5	0,6		
Ireland									0,4						
Italy						0,7	0,7	1	0,7	0,7	0,8	0,8	0,8		
Luxembourg								0,6							
Netherl	0,9	1,1	1,1			1,3		1,1	1,1	1,2	1,1	1,2		1,1	
Poland									0,8	0,8	0,7	0,7	0,6	0,7	0,8
Portugal	0,7	0,6	0,7	0,7	0,6		0,6	0,7	0,5	0,5	0,5	0,5	0,5	0,4	0,4
Slovak Rep	4	2,3	1,8	1,3	0,8					0,5	0,1	0,1	0,2	0,1	
Spain	0,6	0,6	0,4	0,5	0,6	0,6	0,5	0,6	0,6	0,6					
Sweden		0,8	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3		
UK	0,4							0,4	0,4	0,4	0,4	0,4	0,4	0,4	
Max Value	4	2,3	1,8	1,4	1,4	1,5	1,5	1,4	1,5	1,4	1,4	1,4	1,4	1,4	1,3
Min Value	0,4	0,6	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,1	0,1	0,2	0,1	0,4
Median	0,7	0,9	0,8	0,7	0,6	0,65	0,6	0,6	0,55	0,6	0,6	0,6	0,55	0,7	0,8

GERMANY. ENVIRONMENTAL EXPENDITURE, % OF GDP -YEARS 2000-2005

Year	Total Environmental Expenditure - Public Sector (Millions of USD)	Environmental Expenditure (% GDP)	Environmental Expenditure Per capita (in USD)
2000	24.703	1.30	300
2001	22.692	1.19	276
2002	26.243	1.30	318
2003	31.743	1.30	385
2004	31.316	1.14	379
2005	31.771	1.14	385

Source: Based on data from OCDE, Bundesministerium der Finanzen and World Bank.




Latin America

This case does not allow a study of Latin American countries to a level of detail similar to that conducted for the EU, and this is due to the lack of a uniform system of statistics as applied by Eurostat or the OECD.

The performance of individual countries is very uneven and the realization of its environmental expenditure estimates has responded rather to particular projects of some organizations in the region-in particular, CEPAL-only for some economies and for certain periods (since 1992, with the signing of the Rio 92 Conference).

Countries in which there have been progress in this field are: Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, and Peru.





Argentina and Brazil Progress (I)

Argentina Case (Oscar Cetrángolo, O.- Chidiak, M.- Curcio, J.— Gutman, V. CEPAL: 2004 and Chudnovsky, D.- López, A.: 2002)

There is a system of environmental statistics of environmental public spending. The minimum levels reached in 2002 both in absolute value (397 million dollars) in relation to GDP (0.38%). The bulk of environmental spending is done by municipalities (3 / 4 of the total), about 1 / 5 is done by the provinces and only 5% by the National Government. There is the preponderance of funding from the National Treasury with a growing involvement of external sources.






Argentina and Brazil Progress (II)

Brasil Case (Young, C.E.-Roncisvalle, C.A.CEPAL: 2002)

At the federal government level, it was estimated that environmental expenditures were between 0.4% and 1% of the federal spending. The overall federal government expenditures in environmental issues did not increase during the 1993-2000 period. For the 1996-98 period show that, if sanitation costs are included (an overestimate since it also considers water supply), environmental expenditures are relatively more important for local governments: around 9% of the total public spending in the sample of *municipios* considered. For the year 2000 that the public spending on environmental issues was of 1.5% of the total, the public environmental spending would be of 0.33% of GDP, and an annual expenditure per capita of US\$ 9.2 . If the estimated industrial environmental spending is added, the total spending becomes 0.34% of GDP or US\$ 9.6 per capita. Most of the funding for environmental projects comes from the government (mainly federal, through BNDES), international development agencies, or from companies' own resources. Foreign resources for projet presented a declining trend since 1994, oscillating between 6% and 17% of total expenditures.



**BRAZIL.ENVIRONMENTAL TOTAL PUBLIC EXPENDITURE BY
GOVERNMENT – YEARS 1996-1998**

Year	Federal Government		State Government		Municipal expenditure		Total	
	Mil. R	%	Mil. R	%	Mil. R	%	Mil.R	%
1996								
Total expenditure	1.035.285	15,31	1.715.547	25,36	4.012.162	59,32	6.762.994	100,00
Current expenses							5.035.218	74,45
Investement							1.727.776	25,55
1997								
Total expenditure	1.214.187	17,81	2.104.661	30,88	3.497.102	51,31	6.815.950	100,00
Current expenses							5.485.474	80,48
Investement							1.330.476	19,52
1998								
Total expenditure	1.783.938	20,93	3.047.521	35,76	3.691.336	43,31	8.522.595	100,00
Current expenses							6.751.821	79,22
Investement							1.770.774	20,78

Source: Based in Young, C.E.-Roncisvalle, C.A.(2002)



BRAZIL ENVIRONMENTAL EXPENDITURE, % OF GDP
ENVIRONMENTAL EXPENDITURE PER CAPITA
YEARS 2000-2005


Year	Total Environmental Expenditure - Public Sector (Millions of USD)	Environmental Expenditure (% GDP)	Per capita Environmental Expenditure (in USD)
2000	7.214,628	0.62	24.04
2001	11.835,288	0.91	33.21
2002	7.558,402	0.51	14.83
2003	14.153,396	0.83	21.84
2004	8.226,421	0.42	12.19
2005	9.576,004	0.45	17.26
2006	9.240,488	0.40	17.62

Source: Based on data from Instituto Brasileiro de Geografia e Estatística (IBGE), Consultoria de Orcamento e Fiscalizacao Financeira - COFF; Centro de Informática - CENIN; Centro Latinoamericano y Caribeño Demografía – CELADE, and World Bank.





Brazil Case

- The lack of appropriate information for this economy, based on government budgets at all levels, has not enabled to advance in the estimate of added environmental expenditure for the years 2000 and 2006. Assuming that the share of different government levels is constant, at average level of 1996, the environmental expenditure of the federal government budget permits to obtain one estimation of total public environmental expenditure. The environmental expenditure in terms of GDP shows an increase between the years 2000 and 2001, but decrease to 0,40% in 2006. Brazil has spent an variable amount of dollars per capita for environmental expenditure for 2000's, between a maximum of 33.21 in 2001 and a minimum of 12,19 in 2004, near at the 90's value.
 - An analysis of the above federal government budgets shows that Brazil devoted much of its environmental expenditure, about 40%, to agricultural sector (agriculture and agrarian organization), followed in order of importance spending allocated to the transportation sector (20% total).
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**ARGENTINA. ENVIRONMENTAL TOTAL PUBLIC EXPENDITURE (*) BY
LEVELS OF GOVERNMENT AND % IN THE GDP -YEARS 1994-2000**

Year	Nation		Province (**)		Municipios (***)		Total		%GDP
	Mill. \$	% s/ Total	Mill. \$	% s/ Total	Mill. \$	% s/ Total	Mill. \$	% s/ Total	
1994	43	3.28	330	25.72	908	71.00	1281	100	0.50
1995	57	4.56	335	26.82	856	68.61	1248	100	0,48
1996	69	6.01	241	21.01	837	72.97	1147	100	0.42
1997	69	5.57	236	18.92	933	75.50	1237	100	0.42
1998	109	7.74	290	20.18	1017	72.07	1407	100	0,47
1999	94	6.18	437	28.20	1.046	65.61	1521	100	0.53
2000	67	4.68	390	25.99	996	69.32	1431	100	0.51
2001	61	4.65	254	19.36	997	75,99	1312	100	0.49
2002	59	4.95	212	17.78	921	77,26	1192	100	0.38
Mínimo	43	-	212	-	837	-	1147	-	0.38
Máximo	109	-	437	-	1046	-	1521	-	0.53
Media	70	5.43	318	24.02	946	70.54	1308	100	0.47

(*) Net expenditure on transfers to provinces, municipalities and National Universities.

(**) The data for the year 2002 was estimated according to the available data.

(***) The figures for the years 1998-2002 were estimated according to the available data.

Source: Based on data of Chudnosky, D.; López, A. (2002) and Cetrángolo, O., and Chidiak, M., Curcio, J., Gutman, V 2004

**ARGENTINA: ENVIRONMENTAL EXPENDITURE, % OF GDP-
ENVIRONMENTAL EXPENDITURE PER CAPITA
YEARS 2000-2005**


Year	Total Environmental Expenditure - Public Sector (Millions of USD)	Environmental Expenditure (% GDP)	Per capita Environmental Expenditure (in USD)
2000	1452,3088	0.51	39,48
2001	1307,8546	0.49	35,20
2002	374,1358	0.37	9,97
2003	864,3913	0.67	22,82
2004	803,5767	0.52	21,02
2005	935,,6208	0.51	24,24
2006	1079,2009	0.52	27,29

Source: Based on data from the Ministry of Economy of the Nation and National Bureau of Budget, Ministry of Finance, Ministry of Economy and Production, and World Bank.

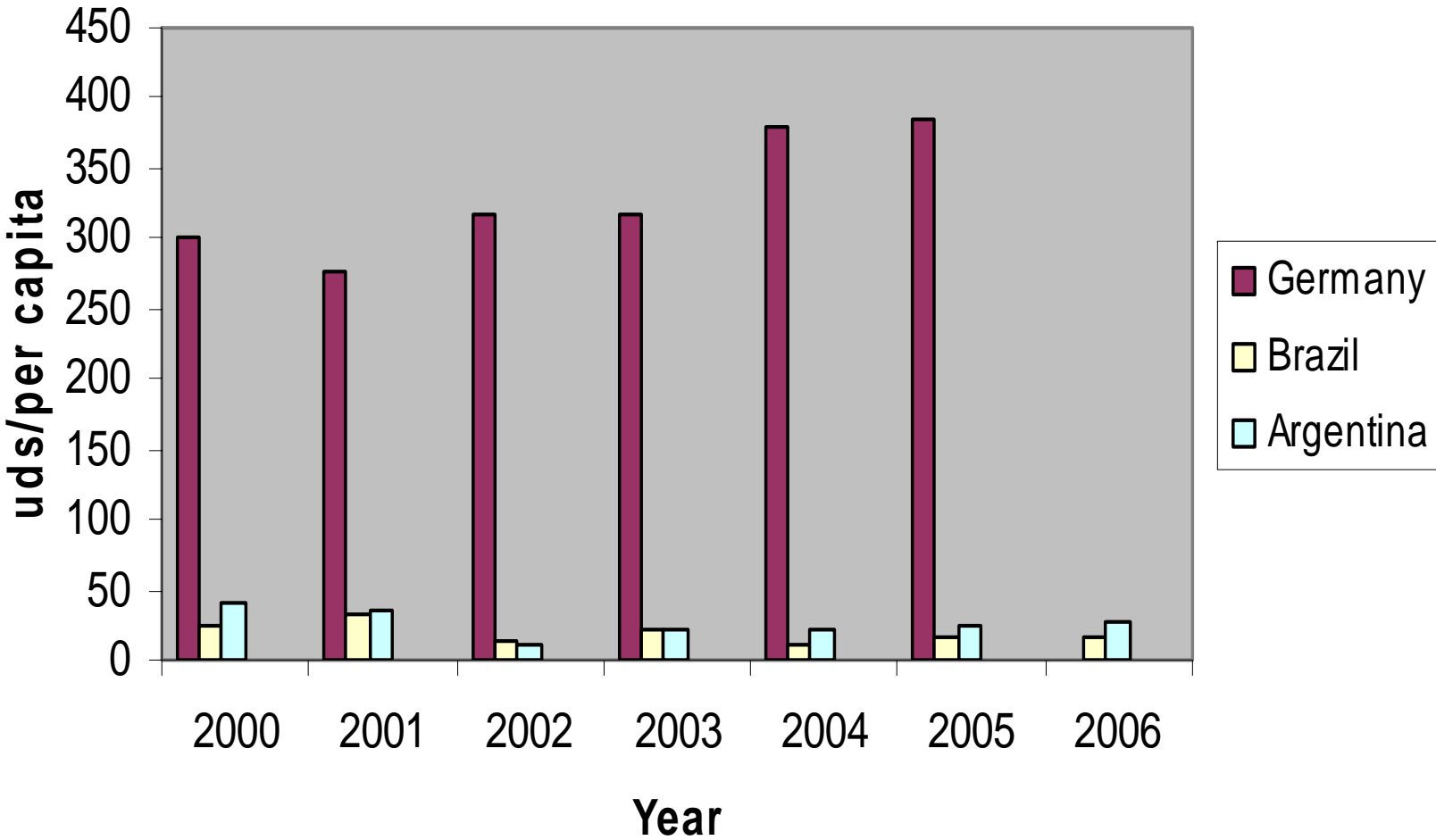


Argentina Case

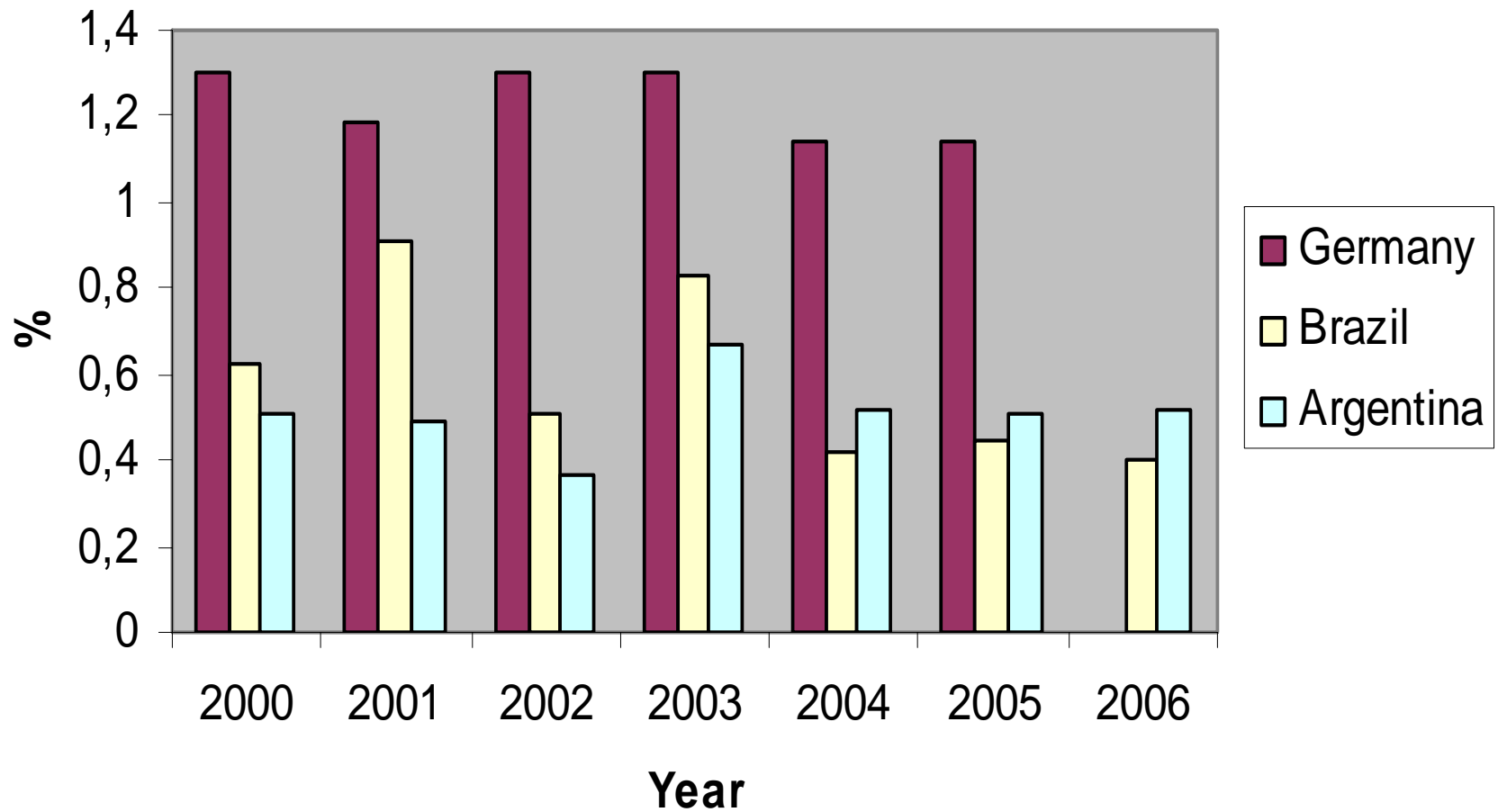
Based on data from the budgets of the federal government, applying equally methodology Chudnosky, D. , and López, A. (2002), and assuming that the share of different government levels is constant at the 90's levels, the series may be extended until the year 2006. It shows that the environmental expenditure, in terms of GDP decreased until the year 2002 at 0,37%, and latter, increase at average value of 90's (0,50), while, Argentina has spent in emvironmental expenditure per capita between a maximun value in 2000 (40 usd), and a minimun in 2002 (9,97usd). The signifficative difference is deu to the financial crisis of 2001.



Environmental Expenditure per capita.




Environmental Expenditure/GDP Años 2000-2006






Conclusions (I)

- The methodologies developed to estimate the environmental if it is seen as a starting point for the OECD, tried to broaden the concept of items which are included. The OECD methodology only consider disbursements resulting in the prevention, control and mitigation of environmental impacts; in the other, is being expanded to include costs arising in environmental protection, working well in calling precautionary effect of the policy environmental.
 - The methodology proposed by Australia appears to be related to the above; it has a very important element from the strictly economic point of view to incorporating a measurement of the efficiency of environmental spending, it pushes the level of analysis and has developed a lot in the estimate of the environmental spending of local governments.
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Conclusions (II)

- The Latin America's case does not allow a study to a level of detail similar to that conducted for the EU. However, there are some countries that exhibit improvements in this field are: Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico and Peru.
 - The Germany's public sector shows the major financial efforts directed to pollution abatement and control, with percentages shares GNP's environmental expenditure between 1.2 and 1.4%. However, these figures should be supported by other indicators to understand the importance of the environmental issue presented in this society.
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Conclusions (III)

- The indicators environmental total public expenditure in % of GDP, and environmental total public expenditure per capita in Germany, Brazil and Argentina shows that while Germany devoted over 1 % of its GDP in all years, Brazil and Argentina have directed around of 0,5% for the same purpose. The differences between Germany and the two Latin American countries are more evident, in terms of the environmental total public expenditure per capita, while Germany has spent an average of 300 USD per capita, in Brazil and Argentina has been lower than 35 USD per capita.
 - To conclude and, taking into consideration the complexity faced when writing this paper, it should be considered as a first attempt to be enlarged through further reseach in the future
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The future researchs

The following research looks for to
advance on the environmental
expenditure of the local governments
in:

Brazil
Argentina

