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This Online Appendix contains the following information:

- Appendix A. Allocation rules. Income, taxes and expenditures
- Appendix B. Argentina: summary of public budget statistics

Appendix A. Allocation rules. Income, taxes and expenditures

A.1 Income

Income data consists of gross geographical product published by Council of Federal Investment (CFI) until 2006 and then updated by regional drivers, and expanded to the GPD using national accounts, with base 1993. The new methodology with base 2004 is not available for a long time span as the used in this paper. This is a broad definition of income, which is consistent with the size of the public budget under analysis.

A.2 Public budget

Information on national and provincial public budgets for years 1995-2010 are obtained from the Secretariat of Treasury at the Ministry of Economics, the National Bureau of Fiscal Coordination with Provinces (DNCFP), the Argentinean Association of Public Budget and Public Financial Administration (ASAP), the Economic Commission for Latin America and the Caribbean (ECLAC) and the National Administration of Social Security (ANSES). Public debt services are not included in the analysis.

Although final result on national budget was equal in different sources of information, data from ASAP and from the Secretariat of Treasury at the Ministry of Economics, didn't match exactly. For that reason we adjusted national taxes in order to make them comparable preserving the fiscal deficits at both national and provincial levels.

A.3 Tax and expenditure incidence

In order to determine the incidence of national taxes and expenditures on different groups of households (classified into five income categories, according to the per capita household income in each province), we have to allocate taxes (by source) and expenditures (by destination) to a quintile i in province j in two steps. The first step involves the distribution of taxes collected and expenditures in the years considered among provinces to capture the geographical source of revenues (this is only done at national level). The second step consists on the allocation of taxes collected, and expenditures, in each province to quintiles.

A.3.1. Geographical allocation

A.3.1.1 National expenditures

We consider four large categories of expenditures:

1. Social Services, composed by Social security: which consists of (1) contributory and noncontributory pensions which are allocated using information about contributions from ANSES;

(2) Former Military Program of Pensions: 50% as contributory pensions and 50% per population.
(3) Federal Police Program: 50% to CABA and 50% per population. There is missing information of the decomposition among (1) and (3) between 1995 and 1999, which is filled by assuming regional distribution following a trend between those two years and applying those trends to total annual amounts; Universal Child Allowance: based on information from “Gasto Público Social y su distribución a las Provincias en el Presupuesto Nacional 2012”; Protection and Social Assistance: 2/3 are distributed on the basis of proportion of population under the poverty line and 1/3 per population; Education and Culture: college education allocated 50% based in the location of the university and 50% per population. The remaining amount of education and culture is allocated per population; Health is allocated per population; Work, Housing and Water and Sewerage: 50% per population and 50% on the basis of proportion of population under the poverty line. Subsidies to AySA were allocated between CABA and Buenos Aires as a function of connections.

2. Economic Services, composed by: Energy, Mining and Fuel composed primarily by transfers to the private sector which were allocated in terms of the contribution of each consumer-province to the deficit, in some cases based on the total provincial consumption or when available by official reports; Transport expenditures were allocated according to the transfers of the national government to the respective location of the different operators, which correspond with between 80-100% to City of Buenos Aires and Province of Buenos Aires (and the distribution between these two jurisdictions were based on the number of passengers) while expenditures on Aerolíneas Argentinas were allocated according to the participation of each province in the higher quintile of the income distribution of the country; Communications were allocated by population; Ecology and Environment were distributed by province per population and Agriculture, Industry, Trade, Tourism, Insurance and Finance were allocated by provincial consumption.

3. Defense and Security: 50% per population and 50% per GGP.

4. General Administration: according to the resulting provincial distribution of the rest of the expenditures considered.

A.3.1.2. National taxes

- Value Added Tax: given the lack of annual data of consumption at the provincial level, we estimated a cross section regression with data from the 2004/2005 Household Surveys of Income and Consumption (HSIC). We used as a dependent variable the per capita consumption expenditures and then we took as independent variables proxies at the provincial level: the energy consumption from residential users, supermarket expenditures and the number of patented cars all in per capita terms. The estimated coefficients were used to estimate the per capita provincial consumption of 1995-2010.

- Income Tax (both Personal and Corporation), Personal Property Taxes, Monotributo and Capital Resource Tax were allocated according to total household income.

- Contributions to Social Security: we adopted a criteria based on the employment rate adjusted by the economically active population (EAP) at the provincial level (using a lineal trend because we only have information for 2001, 2005, 2010 and 2015).

- Bank Credits and Debits: 80% as VAT and 20% as the Income Tax.

- Liquid Fuels: according to the consumption of liquid fuels.

- Internal Taxes and Others tax resources were allocated in terms of the average of the “Domestic Taxes”, which include VAT, Income Taxes, Liquid Fuels, Contributions to Social Security, Personal Property, Monotributo and Bank Credits and Debits, excluding the Foreign Trade Taxes.

- Export Taxes: were assigned according to the provincial origin of the exported products and subject to taxes under the existing taxes in Argentina.
- Import Duties and Statistic Rate were allocated on the basis of the Gross Geographic Product.
- Property Rents and Current Transfer: per population.

A.3.2. Personal allocation

In order to allocate taxes and expenditures among quintiles we use information from several surveys. In the case of taxes we always use information from the 2004 and 2012 HSICs and intrapolate the values obtained to get the weights for each year.

In the case of expenditures, we clarify which survey was used in each case by putting its name in brackets. When we use PHS, we calculate annual weights during the period 2003-2010, and extrapolate them to 1995-2003. When we use the Living Condition Survey (LCS) from 2001, we fix weights for the full sample. Finally, when we use the HSIC, we apply the same procedure as in taxes.

A.3.2.1. National taxes

- VAT : we allocate this tax according to final consumption.
- Personal income tax, *monotributo* and asset tax: we assign these taxes to the legal subject.
- Corporate income tax: we assign this tax considering that it is passed on an equal proportion to income labor, consumption and capital income.
- Gasoline and fuel tax: in the case of final consumption (about 80%) we consider consumption of gasoline and in the case of intermediate consumption of fuels we use total consumption of goods.¹
- Internal taxes: we allocate them on a weighted average basis (according to collection) that includes taxes on cigarettes, alcoholic beverages, non-alcoholic beverages, telephony and insurance. The usual incidence assumption in this case is that taxes are paid by final consumers.
- Tax on financial transactions: 80% of the tax is assigned on final consumption and 20% on income.
- Taxes on international trade: the main tax bases of export taxes are agricultural products and hydrocarbons. We assume that the tax burden lies on landowners in the case of agricultural products and on the highest quintile in the case of hydrocarbons. In order to distribute taxes on imports we consider the distribution of total consumption.
- Social security contributions: distributed according to the distribution of contributions paid registered workers.
- Capital resources are allocated considering income distribution.

¹ This is the assumption used by Gasparini (1998) after analyzing the costs and benefits of estimating the impact of energy costs on final-product prices through an input-output matrix. The bias of assigning this tax (which represents 20% of gasoline tax) according to final consumption, rather than consumption of “energy-weighted goods and services,” should be minor.

Gasparini, L. (1998). “Incidencia distributiva del sistema impositivo argentino”, in *La reforma tributaria en la Argentina*, Fundación de Investigaciones Económicas Latinoamericanas (FIEL).

- Other items (non-tax revenues, sales of state owned goods and services, leasing rents): on a per capita basis.

A.3.2.2. Provincial taxes

- Turnover tax: We combine the three different incidence criteria from corporate income taxes considering the productive structure of each province.
- Property tax: we use a combination of expenditures on housing, total consumption and wages.
- Automobile tax: We allocate this tax according to information on automobile insurance payments.
- Stamp taxes are distributed equally between expenditures on: housing, rents, commissions and contracts and administrative services.
- Social security contributions: we allocate the burden of these contributions on workers.
- Other taxes, revenues from the sale of goods, Property rents and Royalties are distributed on a per capita basis.
- Capital revenues are distributed according to per capita household income.
- Current taxes and Others non-tributary taxes are allocated considering the distribution of automobile, stamp, turnover, property and other tributary taxes on an equal basis.

A.3.2.3. National and provincial expenditures

We allocate expenditures among quintiles of income distribution following a benefit principle (we distinguish between national and provincial governments whenever it is necessary). Some weights remain fixed in time because of lack of information (Health and Housing) or by assumption (Culture, Science and Technology, Water and sewerage, Other urban services and Primary production), while some others (General Administration, Justice and Defense, Education, Pension funds, Transport and communication services, Other economic services, Health insurance and Transfers to municipal governments, Work, Welfare, Energy, fuel and mining and Industry) vary on an annual basis.

- Education (PHS) allocated on the number of students attending public institutions at pre-school, primary and high school (provincial expenditures) and universities (national expenditure).
- Health (LCS) we allocate health expenditure among individuals without health insurance and we add a 25% associated with health insurance programs among beneficiaries of these programs.
- Health insurance for retired and pension holders (PHS) according to the distribution of retirees and pension holders.
- Pension funds (PHS): weights are built using the distribution of retirees and pension holders.
- Water and sewerage (LCS): we assign 75% of total expenditure according to users of the service and 25% according population.
- Housing (LCS) we distribute this expenditure among beneficiaries of loans for housing construction.
- Welfare (PHS): We assign this expenditure considering the amount of people living in poverty.

- Work: 2/3 of this category is assigned to beneficiaries of the program *Jefes de Hogar* and 1/3 according to family allocations (we adopt the assumption made by CEDLAS-DGSP (2004, Table 11.9)).
- Culture, Science, and Technology; Water and Sewerage; and Other urban services: on a per capita basis.
- Economic services: This expenditure category is divided into five sub-categories that target different beneficiaries. “Energy, fuel and mining” (HSIC) is allocated using the distribution of energy and fuels consumption. “Industry” (HSIC) is allocated using the distribution of manufactured-products consumption. “Transport and communication services” (HSIC) is allocated considering evenly total consumption of goods and services, expenditures related to transportation (automobile), and expenditures related to tourism. “Primary production” is allocated on a per capita basis. Finally, “Other economic services,” is assigned proportionally to the main four sub-categories.
- Transfers to municipal governments allocated using the following rule: 35% according to the use of urban services, 18% per users of the Public Health System, 8% according to the distribution of welfare programs (these weights correspond to estimates of municipal expenditure by identified categories), and 19.5% by population. The remaining 19.5% is assumed to be “municipal general administration”.
- Justice - Defense and Safety: 50% per population and 50% per income.
- General administration: we assume that the beneficiaries of this category are directly related to the beneficiaries of the sum of other categories.

Appendix B. Argentina: regional indicators and summary of public budget statistics

Table B.1 Regional indicators, 2010

Jurisdiction		Surface (sq km)	Population ('000)	Population density	GGP (million dollars)	Per capita GGP ('000 dollars)	Human Development Index (2011)	Unsatisfied basic needs
A	Buenos Aires	307,571	15,316	49.8	130,332	8,510	0.84	8%
A	City Bs As (CABA)	200	3,058	15,291.5	84,128	27,508	0.89	6%
A	Córdoba	165,321	3,397	20.5	26,671	7,852	0.86	6%
A	Mendoza	148,827	1,766	11.9	12,282	6,956	0.85	8%
A	Santa Fe	133,007	3,285	24.7	32,966	10,035	0.85	6%
A	Advanced (5 prov.)	754,926	26,822	35.5	286,379	10,677	0.85	7%
I	Entre Ríos	78,781	1,282	16.3	7,861	6,132	0.84	8%
I	Salta	155,488	1,267	8.2	5,006	3,950	0.83	19%
I	San Juan	89,651	715	8.0	3,293	4,605	0.83	10%
I	San Luis	76,748	457	6.0	3,020	6,611	0.83	8%
I	Tucumán	22,524	1,512	67.1	6,615	4,377	0.84	13%
I	Intermediate (5 prov.)	423,192	5,233	12.4	25,794	4,929	0.84	12%
LD	Chubut	224,686	471	2.1	5,854	12,436	0.85	8%
LD	La Pampa	143,440	341	2.4	1,823	5,338	0.86	4%
LD	Neuquén	94,078	565	6.0	7,780	13,764	0.86	10%
LD	Río Negro	203,013	604	3.0	4,790	7,933	0.85	9%
LD	Santa Cruz	243,943	234	1.0	3,767	16,092	0.87	8%
LD	Tierra del Fuego	21,571	134	6.2	2,551	19,081	0.88	14%
LD	Low Density (6 prov.)	930,731	2,349	2.5	26,565	11,309	0.86	9%
L	Catamarca	102,602	404	3.9	3,253	8,047	0.84	11%
L	Chaco	99,633	1,071	10.8	4,117	3,844	0.81	18%
L	Corrientes	88,199	1,036	11.7	4,259	4,112	0.83	15%
L	Formosa	72,066	556	7.7	1,919	3,453	0.81	20%
L	Jujuy	53,219	698	13.1	3,089	4,422	0.83	15%
L	La Rioja	89,680	355	4.0	1,526	4,294	0.83	12%
L	Misiones	29,801	1,111	37.3	7,402	6,660	0.82	16%
L	Santiago del Estero	136,351	884	6.5	3,340	3,781	0.81	18%
L	Lagged (8 prov.)	671,551	6,116	9.1	28,905	4,726	0.82	16%
	Argentina	2,780,400	40,519	14.6	367,643	9,073	0.85	9%
	(std. deviation)					0.64	0.03	0.51

Source: own elaboration based on INDEC Argentina (surface, population, and Unsatisfied Basic Needs), and United Nations (Human Development Index). GGP published by Council of Federal Investment (CFI) until 2006 and then updated by regional drivers, and expanded to the GPD using national accounts, with base 1993
 Note: A: Advanced; I: Intermediate; LD: Low Density; L: Lagged. The exchange rate was 3.93 Argentine pesos per dollar in year 2010.

Table B.2. National, provincial and consolidated budgets. Period 1995-2010. Values as % of GDP

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	95-01	03-10	95-10
National Expenditure	17%	17%	15%	16%	18%	18%	18%	14%	15%	14%	16%	16%	17%	18%	22%	23%	17%	18%	17%
Discretionary Transfers	0%	1%	0%	0%	0%	1%	0%	1%	1%	1%	1%	1%	2%	1%	2%	3%	0%	1%	1%
Cash expenditure	7%	8%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	9%	10%	7%	8%	7%
In-kind expenditure	8%	8%	7%	7%	7%	7%	7%	5%	6%	6%	7%	7%	8%	9%	11%	12%	7%	8%	7%
Social services	11%	11%	10%	10%	10%	11%	10%	9%	9%	9%	9%	10%	10%	10%	13%	14%	10%	11%	10%
Economic services	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	3%	4%	5%	1%	3%	2%
Administration, justice, defence	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	3%
Debt interests	2%	2%	2%	2%	3%	4%	4%	2%	2%	1%	2%	2%	2%	2%	2%	2%	3%	2%	2%
National Resources	16%	15%	14%	15%	15%	16%	14%	15%	17%	17%	18%	18%	19%	20%	23%	25%	15%	20%	17%
Direct taxes	6%	5%	4%	5%	4%	5%	4%	4%	4%	4%	4%	4%	4%	6%	6%	7%	5%	5%	5%
Indirect taxes	10%	10%	10%	10%	10%	12%	10%	11%	13%	14%	14%	14%	13%	15%	15%	17%	10%	14%	12%
Production, consumption, transfers	6%	6%	6%	6%	6%	6%	6%	7%	9%	10%	9%	9%	10%	11%	10%	11%	6%	10%	8%
Income, assets	7%	6%	6%	6%	6%	6%	6%	6%	6%	7%	7%	7%	8%	8%	9%	10%	6%	8%	7%
Other	3%	2%	3%	2%	3%	4%	2%	3%	3%	1%	2%	2%	2%	2%	4%	4%	3%	2%	3%
National Balance	-2%	-3%	-2%	-2%	-3%	-2%	-5%	0%	1%	3%	1%	1%	1%	1%	-1%	-1%	-3%	1%	-1%
Provincial Expenditure	14%	14%	14%	14%	15%	15%	16%	13%	13%	13%	14%	15%	15%	16%	18%	18%	15%	15%	15%
Cash expenditure	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
In-kind expenditure	12%	11%	11%	12%	12%	12%	13%	10%	10%	11%	12%	12%	13%	13%	15%	15%	12%	13%	12%
Social services	8%	8%	8%	8%	9%	9%	10%	8%	8%	8%	9%	9%	9%	10%	12%	11%	9%	9%	9%
Economic services	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Administration, justice, defence	4%	4%	4%	4%	4%	4%	5%	4%	4%	4%	4%	4%	4%	5%	5%	5%	4%	4%	4%
Debt interests	0%	0%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Resources - Provincial Budget	13%	13%	14%	13%	14%	14%	14%	12%	13%	14%	15%	15%	15%	16%	17%	18%	13%	15%	14%
Provincial Resources	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	8%	9%	9%	7%	8%	7%
Direct taxes	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Indirect taxes	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%	6%	5%	6%	5%
Production, consumption, transfers	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%	4%	3%	4%	3%
Income, assets	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%
Other	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Revenue-sharing regime	5%	6%	6%	6%	6%	6%	6%	5%	5%	6%	6%	6%	7%	7%	7%	7%	6%	6%	6%
Direct taxes	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Indirect taxes	5%	5%	5%	5%	5%	5%	5%	4%	5%	6%	6%	6%	6%	6%	6%	6%	5%	6%	5%
Production, consumption, transfers	4%	5%	4%	4%	4%	4%	4%	3%	3%	4%	4%	4%	4%	4%	4%	5%	4%	4%	4%
Income, assets	1%	1%	1%	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Discretionary transfers	0%	1%	0%	0%	0%	1%	0%	1%	1%	1%	1%	1%	2%	1%	2%	3%	0%	1%	1%
Provincial Balance	-1%	0%	0%	-1%	-1%	-1%	-2%	-1%	0%	1%	0%	0%	0%	0%	-1%	0%	-1%	0%	0%
Consolidated Expenditure	31%	31%	29%	30%	33%	33%	35%	27%	28%	27%	30%	31%	32%	34%	40%	41%	32%	33%	32%
Cash expenditure	9%	9%	9%	9%	9%	10%	10%	9%	9%	9%	9%	9%	10%	10%	12%	12%	9%	10%	10%
In-kind expenditure	20%	19%	18%	18%	20%	19%	19%	15%	16%	16%	18%	19%	20%	22%	26%	27%	19%	21%	20%
Social services	19%	19%	18%	18%	20%	20%	20%	17%	17%	17%	18%	19%	20%	21%	25%	25%	19%	20%	19%
Economic services	3%	2%	2%	2%	2%	2%	2%	1%	2%	2%	3%	4%	4%	5%	5%	6%	2%	4%	3%
Administration, justice, defence	7%	7%	7%	7%	8%	7%	7%	6%	6%	6%	6%	6%	6%	6%	8%	8%	7%	7%	7%
Debt interests	2%	2%	2%	3%	4%	4%	5%	3%	2%	2%	3%	2%	2%	2%	3%	2%	3%	2%	3%
Consolidated Resources	28%	27%	27%	28%	28%	30%	27%	26%	29%	31%	31%	32%	33%	35%	38%	41%	28%	34%	31%
Direct taxes	8%	7%	7%	7%	7%	7%	7%	6%	6%	6%	6%	7%	8%	9%	11%	11%	7%	8%	8%
Indirect taxes	20%	20%	21%	21%	21%	22%	20%	20%	23%	25%	25%	25%	25%	26%	27%	30%	21%	26%	23%
Production, consumption, transfers	13%	13%	13%	14%	13%	13%	13%	13%	15%	17%	17%	17%	18%	19%	19%	20%	13%	18%	15%
Income, assets	11%	10%	10%	11%	11%	11%	11%	9%	10%	11%	12%	12%	13%	13%	15%	16%	11%	13%	12%
Other	4%	4%	4%	4%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	5%	5%	4%	3%	4%
Consolidated Balance	-3%	-3%	-2%	-3%	-5%	-3%	-7%	-1%	2%	4%	1%	1%	1%	0%	-2%	0%	-4%	1%	-1%

Source: own elaboration based of public information on fiscal budgets.