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Revisiting distributional effects of energy subsidies in Argentina*

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Abstract

We review the distributional incidence of residential energy subsidies using the attractive case of Argentina, a developing country that has massively subsidized electricity in recent decades. Using multiple data sources, we explore two central dimensions, usually omitted in previous research. On the one hand, we focus on geography given that previous studies mostly focus on the Buenos Aires Metropolitan Area (i.e., AMBA), the most populated region in the country. However, Argentina's territorial heterogeneity demands further analysis, given that the stage of electricity distribution introduces heterogeneities between jurisdictions. On the other hand, we focus on the subsidies' financing given that previous studies do not focus on the net incidence. Our results indicate that: regional disparities in the costs of electricity distribution and the prices set by the distribution companies are key drivers of the distributional incidence. Also omitting subsidies' financing may lead to overestimating the belief about their redistributive effect.

JEL Codes: H22, D31, D78, Q48.
Keywords: distributive incidence, subsidies, electricity, Argentina.

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1 Introduction

This paper reviews energy subsidies in Argentina, focusing specifically on the distributional impacts of those allocated to residential electricity consumption.[1] As well established by previous literature, Argentina is an interesting case study as it is a developing country that has massively subsidized energy consumption in recent decades (Hancevic *et al.*, 2016; Giuliano *et al.*, 2020). In fact, the country is in the top 25 ranking of energy subsidiaries (IEA, 2022). Figure 1, Panel (a), shows the evolution of prices and costs for the wholesale electricity market during the period 1992-2022. A remarkable divergence can be appreciated since 2002. Combining prices and costs with the physical consumption, the total amount of the electricity subsidies is obtained and presented in Panel (b). From 0.1 percent of GDP in 2002, electricity subsidies rose to 1.1 percent in 2015, were reduced to 0.6 percent for 2019, and in 2022 stood at 1.0 percent.

This policy of massive subsidies has generated a lot of discussion from both academic and political points of view. A central issue has been the distributional impact which has been widely analyzed by applied research. The empirical consensus highlighted a singular result: subsidies have been progressive since the poorer sectors received higher subsidies relative to their income (Hancevic *et al.*, 2016; Giuliano *et al.*, 2020).[2] Interestingly, the consensus presents two particularities. First, it focuses on the Buenos Aires Metropolitan Area (i.e., AMBA) given its geographical representativeness and data availability.[3] Second, it focuses on the incidence of subsidies without considering how the government finances them. In this paper, we address these two particularities, and we show that regional disparities and public financing are two central dimensions for a better understanding of the subsidies' distributional effects.

Considering regional disparities is central given that Argentina subsidizes electricity in the Wholesale Electricity Market (WEM), with the federal government covering the difference between the generation and transmission costs and the price paid by regional distributors (i.e., the companies that bring the electricity to final users). Thus, the unitary subsidy in the WEM is the same for all jurisdictions and consequently for all final users. However, distribution costs are determined by the cost structure of each energy distributor company (i.e., distance to final users, operational efficiency, etc.). Currently, there are more than 600 regional companies throughout the country that differ in their pricing criteria for cost recovery (e.g., they apply higher prices at higher levels of consumption).[4] Here regional disparities become central since

[1] Energy subsidies are defined as the difference between the price received by the supply, destined to cost coverage of energy production, and the price paid by the demand. This difference is covered by the government through the national budget (Ministry of Energy, 2019).

[2] See also Lustig & Pessino (2013), Puig & Salinardi (2015) and Lakner *et al.* (2016).

[3] AMBA is a geographical area including the Ciudad Autonoma de Buenos Aires and its surrounding areas, containing 40 municipalities of the Province of Buenos Aires. It covers 13,285 km2. According to the 2022 census, it accounts for approximately 14 million inhabitants, representing 37 percent of Argentina's total population.

[4] Argentina is a federal country with four levels of government: the National, the sub-national that includes

they generate differences in distribution costs. Argentina has an area of 2,795,677 km2 in the American continent, which extends 3,694 kms from north to south and 1,423 kms from east to west. Its territory brings together a great diversity of climates, caused by a latitudinal amplitude that exceeds 30°.[5] In addition, as in many other developing countries, population and production are highly concentrated in a few provinces. When excluding the Autonomous City of Buenos Aires (CABA), four provinces (Buenos Aires, Cordoba, Santa Fe, and Mendoza) account for 60 percent of the total population.[6]

Considering the public financing of subsidies is also central. In 2009, Argentina's primary fiscal balance turned negative (i.e., -0.5 percent of GDP) and initiated a deterioration process (i.e., in 2016 it was -4.7 percent of GDP). In 2020, the COVID-19 crisis brought it to -6.2 percent of GDP. In the back to normal post-COVID, it stood at around 2.0 percent of GDP. Naturally, these figures combined with those in Figure 1 evidence the sizeable contribution of electricity subsidies to Argentina's fiscal stress. Therefore, determining who pays electricity subsidies is central to concluding on their distributional effects. For example, a subsidy itself may be progressive but becomes neutral or regressive if it is financed with a regressive tax. This issue is at the heart of public finance analysis. Musgrave (1964) emphasizes this point many decades ago *"..[a]ny meaningful theory or policy in public finance must ultimately combine the issues posed by the two sides of budget. This, indeed, is the cardinal principle of the economist's view of public finance"*. In the same spirit, Ebeke & Ngouana (2015) suggest that a comprehensive distributional analysis should look at subsidies against other spendings. Higher energy subsidies can substitute public social spending with strong power to redistribute (e.g. spending on education).

To address these two particularities, we rely on multiple data sources for empirical analysis. First, we estimate the subsidy in the WEM using aggregate data on prices and quantities by jurisdiction. There we show how the differences between the subsidies allocated to each jurisdiction stem solely from their share in the overall country's consumption of electricity. Second, we estimate the costs at the distribution stage using administrative data from electricity distributors. We do this for the AMBA, in order to be on the same page as the previous

23 provinces, the Autonomous City of Buenos Aires, and more than 2300 local governments. Of the latter, nearly 1,100 are municipalities and 1,200 are local governments without a municipal hierarchy (Porto & Puig, 2023).

[5] It is also worth noting a difference in altitude that goes from 107 meters below sea level to almost 7000 meters and the extension of the maritime coastline that reaches 4,725 km. Vast humid plains border extensive deserts and high mountains, while the presence of tropical and subtropical climates in the north contrast with snowfall and extreme cold in the Andean and southern areas.

[6] Also, more than half of Argentina's GDP is concentrated in those four provinces, and just one province (Buenos Aires) accounts for about 33 percent of the country's output. The remaining 19 provinces (i.e., more than 80 percent of the total number of provinces) are typically sparsely populated and show a very high degree of heterogeneity in many aspects (e.g., levels of GDP per capita, productive structure, economic development, and social indicators) (Porto, 2004).

literature, and we extend it to six additional provinces that adequately capture regional disparities: Cordoba, Corrientes, Jujuy, Mendoza, Rio Negro, and Santa Fe. Given the differences in distribution costs and the pricing criteria that supplier companies can adopt in each jurisdiction, we documented additional regional differences in electricity costs. Third, we perform distributional analysis relying on the standard *"benefit-incidence analysis"*(van de Walle, 1998; Demery, 2000; Bourguignon & Pereira da Silva, 2003; Giuliano *et al.*, 2020) combining microdata from Argentina households' surveys and sectoral administrative data (i.e., consumption, prices, and cost). Also, to be on the same page as the previous literature we did not consider public financing at first. Here we confirm, for all the jurisdictions, the literature's consensus: progressive subsidies. Finally, we microsimulate the distributive incidence under alternative financing schemes -although naturally not exhaustive-. On the one hand, we assume that the government finances the electricity subsidy with a general consumption tax (as Argentina implements in practice). On the other hand, we assume that the government finances the subsidy by reducing spending on education. Here we find relevant results: the progressivity of the subsidies is strongly attenuated when financing via general consumption taxes. When financing via lower spending on education, progressivity directly vanishes and fiscal policy as a whole is regressive.

By revisiting the distributional effects of electricity subsidies in Argentina, we contribute with a new applied economic analysis on the effects of an energy policy that has been generating controversies for two decades in the country. However, the lessons are also informative for previous literature on energy subsidies in other developing economies(Dartanto, 2013; Siddig *et al.*, 2014; Acharya & Sadath, 2017; Rosas-Flores *et al.*, 2017; Gelan, 2018). We believe that it is highly relevant to analyze the subsidy and the different stages of the electricity supply chain to understand how subsidies depend on i) the share of each jurisdiction in the overall country's consumption o electricity; ii) the regional disparities that determine the distribution costs and how much households pay for electricity in each jurisdiction. In the same way, we believe it is relevant to include the point on how subsidies are financed. This issue is central to the discussion of economic policy in developing economies, including the incidence of energy policy.

Our contribution to a better understanding of the distributional effects of energy subsidies in Argentina is also accurate and timely. Argentina is currently under an agreement with the International Monetary Fund (IMF) that seeks to reduce the fiscal deficit, and the removal of subsidies for residential energy consumption is a key component in the agreement. What is more, energy subsidies had been a key topic in Argentina's recent presidential debates, and the incoming administration has just announced a subsidy reduction to be implemented during 2024.[7] At the same time, although not covered in this paper, our results may be useful

[7]See here.

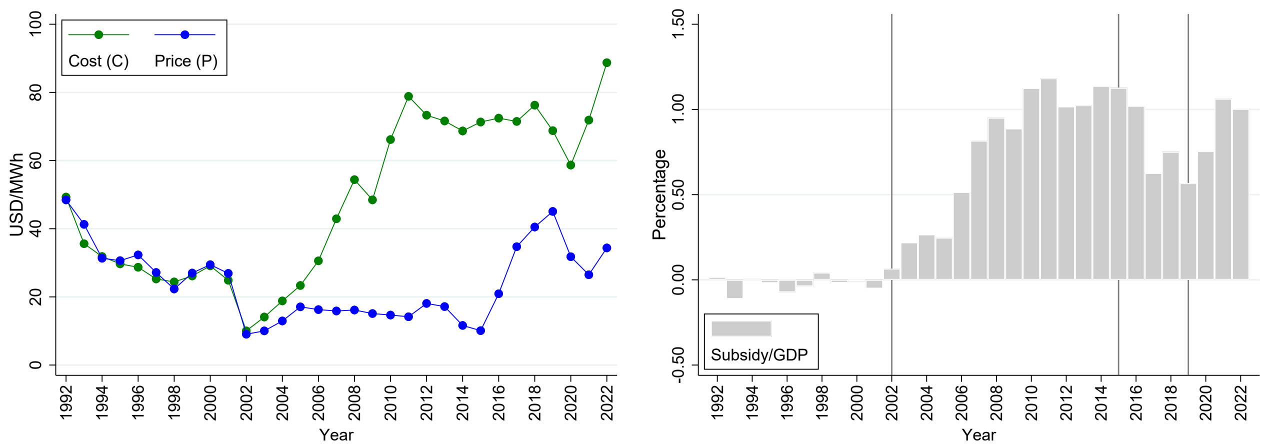
for natural gas subsidies that present very similar features. Since the country is currently a gas importer, an external conflict such as the current conflict between Russia and Ukraine, which puts pressure on international energy prices, will put more stress on energy subsidies. In this sense, lessons from the Argentine experience could be useful for other developing countries dealing with energy subsidies that are also exposed to external shocks in the energy sector. Finally, although the paper does not focus on the dimension of climate change, its conclusions can be useful to think about the potential effects of the transition towards the use of clean energy that contributes to reducing greenhouse gas emissions. At least from the point of view of the effects of energy transition policies on the income distribution.

The remainder of the paper is organized as follows: section 2 contextualizes the case of Argentina and section 3 links the paper to relevant strands in the literature. Section 4 presents the methodology and data for electricity subsidy estimation and their distributional impacts. Section 5 reports the results. Section 6 concludes.

Figure 1: Evolution of prices, costs and subsidies to electricity in Argentina. In dollars and percentage of GDP. Period 1992-2022.

(a) Prices and costs

(b) Subsidies



Source: Own elaboration based on the Wholesale Electricity Market (WEM) Administration Company (CAMMESA). Annual reports. *Note*: The price represents the stabilized price of energy (i.e., the price that demand directly pays). The average cost includes generation and transmission (given by the "monomic cost" in the WEM).

2 Background of electricity subsidies in Argentina

In Argentina, the residential electricity tariffs have three components that are covered by different actors: (i) one representative of the costs of acquiring energy and power in the WEM, including associated transmission costs; (ii) another representative of the value added of distribution (VAD, for its Spanish acronym) constituted by the marginal cost of providing the service[8]; and (iii) national and municipal taxes (i.e., value added tax -VAT- and other taxes). Regarding (ii), there are more than 600 distributors throughout the country that distribute electricity in the 24 subnational jurisdictions. The VAD is regulated by public entities in each jurisdiction and can naturally vary depending on the cost structure of each distributor.[9] In practice, residential users receive an electricity bill that contains a fixed and a variable component. The former is largely associated with the fixed costs of transmission and distribution, and typically represents a sizeable part of consumers' spending. The variable component incorporates the variable cost (i.e., marginal) of the electricity.

As remarked by Giuliano *et al.* (2020), after the deep economic crisis of 2001/02 Argentina's government started to strongly intervene in the energy sector by playing a key role in the decision-making process of electricity prices. The intervention was formalized through the noncompliance of electricity regulatory frameworks which determined pricing reviews every 5 years and the passthrough of eventual increasing costs.[10] This generated a tariff freeze that diminished incentives towards investment in the sector (Barril & Navajas, 2015), reducing the production and reserves of hydrocarbons and pushing the demand for electricity. Since 2003, the wholesale price has increasingly diverged from the economic cost, leading to an increase in "fiscal subsidies" managed by CAMMESA.[11] In addition, transmission and distribution costs were frozen with the aforementioned suspension of the regulatory framework. This latter part of the subsidy is referred to as a "cross-subsidy" since it implies a transfer from the private providers' companies to consumers with no impact on current public spending (Giuliano *et al.*, 2020). Therefore, during this period most of the energy subsidies reached residential and non-residential consumers directly in the form of lower electricity tariffs. The deterioration in tariffs was significant: in 2015, the average household electricity bill covered around 12 percent of the electricity generation cost.

By the end of 2015, electricity subsidies represented around 1 percent of GDP (as shown in Figure 1) putting strong pressure on the national budget, which exhibited a sizeable fiscal deficit (i.e., around 5 percent of GDP). With the objective of alleviating this fiscal pressure and recomposing the signals of the electricity market Argentina envisioned a gradual reduction of subsidies.[12] To accompany the tariff increases in electricity, a social tariff was established as a

[8]The VAD also includes the costs of development and investment in networks, operation and maintenance of the networks, marketing expenses, as well as depreciation and a "fair and reasonable" profitability on the invested capital.

[9]The National Electricity Regulatory Office (ENRE) regulates the VAD in AMBA, while provincial regulators do it in the other jurisdictions.

[10]See Law 24.065.

[11]CAMMESA is a non-profit company. 80 percent of CAMMESA is handled by private agents of the WEM, while the remaining 20 percent belongs to the Ministry of Energy. It is in charge of the administration of electricity supply. It sells electricity to industries and distributors at a price lower than the production cost.

[12]In the previous context and with the aim of rationalizing subsidies, the Ministry of Energy planned increases in wholesale prices for all segments of energy consumption (i.e., residential, commercial, industries and electricity

targeting mechanism to protect the less well-off families.[13,14] The eligibility criteria were based on the level of income and socioeconomic condition of the main service holder.[15] In the case of electricity, the social tariff subsidy covers part of the generation cost of electricity. Specifically, it covers 100 percent of the generation of the first 150 Kwh and 50 percent of the following 150 Kwh consumed per user per month. Beneficiaries pay to the distribution company the reduced cost of electricity, the full cost of transmission, distribution, and taxes, and the same variable cost as non-beneficiaries for the kilowatts over 150 Kwh. Beyond the social tariff, it is worth mentioning that the consumers who did not have access to the social tariff continued to receive electricity subsidies.[16] The reduction of subsidies was reflected in prices: those related to energy practically doubled the evolution of the remaining items of the consumer price index between 2016 and 2019. While the general price level increased 171 percent between December 2016 and November 2019, energy prices increased 377 percent (Giuliano *et al.*, 2020). In 2019, the average household electricity bill covered around 65 percent of the electricity generation cost.

Towards the end of 2019, Argentina was in a sizeable macroeconomic crisis triggered by a sudden stop in May 2018. A new administration in the government, through a "Law of Social Solidarity and Productive Reactivation" establishes a new freeze in the values of electricity bills. Thus, the country began another phase of tariff deterioration with increasing subsidies. By 2022, electricity subsidies had again reached 1 percent of GDP, and the average household electricity bill covered around 35 percent of the electricity generation cost.

3 Related literature

Our paper is closely related to several contributions on the impact of energy policy reforms on income distribution. Rosas-Flores *et al.* (2017) use household survey microdata to simulate partial or total energy subsidy removal in Mexico. The simulations respond to the need for an assessment of the economic and environmental impacts of this policy reform. In line

generators in the case of natural gas consumption).

[13]The social tariff was established in Resolution No. 7/2016, followed by Resolutions 6/2016, 28/2016, and more recently 122/2018 from the Ministry of Energy. It has not been substantially modified since its implementation.

[14]The social tariff was also established with the aim of encouraging the public acceptance of the reform. On the key role of this type of instruments in the political economy of the reforms, see de Mooij *et al.* (2012); Klenert *et al.* (2018); Hammerle *et al.* (2021).

[15]Beneficiaries who qualified for these reduced tariffs were linked to social programs, had incomes from pensions or salaries below two minimum wages or had specific health conditions, among others. To this inclusion criteria, exclusion criteria were added related to property ownership of cars and immovable assets.

[16]See Giuliano *et al.* (2020) for further details on the implementation of this dual-universal and focalized-subsidy scheme.

with our results without considering financing and previous evidence for Argentina, we find that subsidies for electricity are progressive. Krauss (2016) and Ersado (2012) analyzed the distributional effects of a significant natural gas tariff reform in Armenia that increased the country's residential tariff by about 40 percent and showed that poor households are more prone to experience economic distress due to energy tariff increases.[17] In 2010 the government of Iran removed energy subsidies in the context of an aggressive energy price reform. This reform is analyzed by Moshiri (2015) who emphasizes the cash handouts given to all households to compensate for higher prices. This aspect fostered public acceptance of the reform and was initially successful.[18] Dartanto (2013) emphasized the need to phase out the energy subsidy in Indonesia as it was inefficient as well as worsening the fiscal balance, even though the removal of the subsidy would increase the incidence of poverty. To ameliorate the negative effects of the reforms, suggested higher social spending with the saved resources. Also, about subsidy removal and targeting mechanisms to protect the less well-off families, Gelan (2018) simulates a subsidy reduction in Kuwait accompanied by cash transfers to energy users to compensate for welfare losses, indicating that such transfers would reduce the adverse effects of the policy reform.

As our paper revisits the particularities of Argentina's energy policy, it is closely related to several studies that analyzed the distributional incidence of energy subsidies in the country. For example, Lustig & Pessino (2013), Puig & Salinardi (2015) and Lakner *et al.* (2016) show that in absolute terms subsidies were not well targeted since the non-poor sectors were receiving the largest shares, while in relative terms subsidies were progressive since the poorer sectors were receiving higher subsidies relative to their income. This well-established middle-to-high-income bias was also confirmed by Hancevic *et al.* (2016), who relate it as the result of "energy populism" in Argentina. Recently, Giuliano *et al.* (2020) analyzed the distributional effects of the 2016 subsidies' reduction attempt. As the policy reform also includes the introduction of a scheme to protect less well-off families (i.e., the social tariff), the authors also reviewed how well the targeting mechanism works. In line with our paper, Giuliano *et al.* (2020) apply traditional *"benefit-incidence analysis"* using household surveys and administrative data, focusing on residential subsidies to piped natural gas and electricity in the AMBA. They find that energy subsidies in Argentina (lower in aggregate terms) continue to be, although progressive, pro-rich.

[17] Zhang (2011) and Baclajanschi *et al.* (2006) find similar results analyzing the energy price reform in Turkey and Moldova respectively. Mitra & Atoyan (2012) provide evidence in the same line for Ukraine. Siddig *et al.* (2014) have also come up with similar results from Nigeria, where the removal of the energy subsidy of imported petroleum products has resulted in higher prices.

[18] However, many difficulties followed, like excessively large national budget deficit to extraordinary inflation and devaluation, raising questions about the feasibility and sustainability of the direct compensation mechanism, and even of the policy reform itself (Breton & Mirzapour, 2016).

To this specific literature, we contribute with the approach of the two dimensions introduced in Section 1. First, the extension of the geographical analysis beyond the AMBA, the typically studied region by the aforementioned contributions. This is important as it sheds light on who each jurisdiction benefits from the subsidies and informs us on potential regional effects of future reforms in energy policy. Second, the addressing of the net fiscal incidence when including public financing in the analysis. As this dimension is omitted by the aforementioned contributions we consider it to be very informative, mainly in light of the results. The effects of energy subsidies on income distribution are quite different if public financing is not considered. Thus, this dimension is crucial to the economic policy debate, and the lessons from the paper can be very useful beyond the Argentine case.

4 Methodology and data

The methodology to estimate the electricity subsidies and their distributional incidence involves several steps. First, we determine the costs and prices of electricity for each stage of the supply chain. For this, administrative data from the electricity sector is used. Second, in order to establish how much of the overall subsidies are allocated to each jurisdiction, we integrate costs and prices with physical consumption by the jurisdictions. Third, in order to determine the distributional incidence, we estimate electricity consumption at the household level. Microdata from household surveys is employed in this step which is finally combined with the aforementioned data on prices and costs to estimate the subsidy at the household level. Here we also microsimulate the alternative ways of financing the subsidies. These steps are further described below.

4.1 Prices and costs for estimating subsidies

We began by estimating the prices and costs at the WEM. The price variable here is the "Seasonal Monomic Price" (i.e., the price paid by the distribution companies), which is discretionally established by the federal government through regulations. On the other hand, the provision costs variable is known as "Total Monomic Cost".[19] The information on both variables is drawn from CAMMESA.[20] In order to coincide with the year of the microdata (see below) we rely on the figures for the year 2018. In any case, the simulated situation can be considered valid until the end of 2022 as there had been no major changes in the electricity subsidy system. At that time, the "Seasonal Monomic Price" was USD 0.04 per kilowatt-hour (Kwh) while the "Total Monomic Cost" was USD 0.08. Using the -peso per dollar- exchange rate ($28.85/USD), the

[19] Note that in these stages neither the costs nor the remuneration of the distribution companies are considered.
[20] See Appendix A1 for further detail on this data source.

unit price (cost) of electricity at the WEM was $1,17 ($2.20).

Subsequently, we estimate the VAD for the distribution stage. It is important to note that due to the operational performance the VAD may differ between distributors and consequently between jurisdictions. The information on these variables is drawn from the distribution companies. Considering the level of detail required by this estimate and data availability, we extend the AMBA's analysis to six additional provinces representative of all regions of the country that adequately capture regional disparities. These provinces are Cordoba, Corrientes, Jujuy, Mendoza, Rio Negro, and Santa Fe which jointly with AMBA account for more than 65 percent of the country's residential electricity consumption.[21]

The other relevant variable at the distribution stage is the price paid by final users (i.e., households in our paper), which results from tariff charts established by the distribution companies and approved by the regulatory entity of each jurisdiction. The tariff charts -as mentioned in Section 2- present a fixed charge and a variable one for cost recovery, and differentiate into consumption categories, where the charges are higher for users with higher consumption levels. The charts contemplate the lower prices for the beneficiaries of the social tariff as well.[22] Note that this reflects an equity consideration in the pricing of distribution companies when setting their sale prices. And, decisively for the distributive analysis, it should be noted that the price paid by each household -in each jurisdiction- is of the "personalized" type. Using the tariff charts for each company, and the number of users by tariff category and consumption, the unit cost of distribution and the unit price paid by consumers are obtained. The information on consumption and users draws from the Association of Electric Power Distributors of the Argentine Republic (ADEERA).[23]

4.2 Household's electricity consumption.

Once the parameters of prices and costs have been determined, we proceed to estimate household consumption. As in Burguillo *et al.* (2022), we use the most recent Household Income and Expenditure Survey (ENGHo) of Argentina for the years 2017 and 2018 (hereinafter EN-

[21]See Appendix A1 for further detail on this data source and how the VAD is calculated for each jurisdiction. The companies are for AMBA: EDENOR y EDESUR (Empresa Distribuidora de Energía Norte SA y Empresa Distribuidora Sur SA); for Córdoba: EPEC (Empresa Provincial de Energía de Córdoba); for Corrientes: DPEC (Dirección Provincial de Energía de Corrientes); for Jujuy: EJESA (Empresa Jujeña de Energia SA); for Mendoza: EDEMSA (Empresa Distribuidora de Electricidad de Mendoza SA); for Rio Negro: EDERSA (Empresa de Energía de Rio Negro S.A.); and for Santa Fe: EPESF (Empresa Provincial de la Energía de Santa Fe). Note that although in Argentina there are nearly 600 energy distributors (including small cooperatives), we take the most representative distributor in each jurisdiction.

[22]The information on tariff charts from draw also from the distribution companies that operate in AMBA and in the other six analyzed provinces. See Appendix A2 for further details on this data source.

[23]See Appendix A3 for further details on this data source.

GHo 2017/18). Following Navajas (2008) and as in Giuliano *et al.* (2020) we do not directly use quantities as reported in the survey because they tend to under-report when compared with administrative data.[24] Thus, quantities are derived from the reported expenditures after deducting taxes[25] and using the distribution companies' tariff charts.

The social tariff presents an additional methodological challenge for quantity recovery. First, because beneficiaries are not directly identified in the survey. That is, no variable denotes whether or not a household is a beneficiary of the social tariff and therefore a variable must be generated to identify potential beneficiaries. Second, for the same amount of expenditure observed in ENGHo 2017/18, two different levels of consumption may correspond: one for the case in which the identified household has a social tariff and another for which it does not.[26] To overcome these obstacles, a binary variable is created that takes the value 1 if the household meets any of the eligibility criteria required to access the social tariff.[27] Then, we estimate electricity consumption based on the reported spending, the corresponding tariff chart, and the households' classification on whether or not they are social tariff beneficiaries. Having obtained the consumption at the household level, we scale up quantities using administrative information on the effective total consumption of electricity obtained from ADEERA.[28]

The monthly average household consumption (per kilowatt hour -Kwh- and in per capita terms) is presented in Figure A6 (Appendix A6). An increasing consumption pattern can be appreciated as higher levels of income are considered. There are also regional differences in consumption levels: while Cordoba consumes on average about 92.0 Kwh/month, Jujuy (Rio Negro) approximately consumes 51.2 (69.8) Kwh/month. The average consumtion in AMBA is 80.8 Kwh/month.

[24]It is often argued that the under-reporting is due to measurement error as individuals are more likely to know with precision how much they paid for the utility bill than how much many units they consumed. Specifically, in ENGHo 2017/18, 67 percent of the observations on quantities have values equal to or less than one unit.

[25]We updated information reported in Cont (2007). Overall taxation, including national (i.e., VAT) and subnational taxes (i.e., turnover tax, municipal taxes), in electricity, is about 29 percent. Electricity spending is identified in the ENGHo 2017/18 with the variable "amount" when the variable "item" equals "A0451101". The spending is generally reported on a monthly basis. The exception is the AMBA where the expense is reported bimonthly as long as the amount reported by the household is strictly equal to 1.

[26]Note that this methodological issue is not present in Giuliano *et al.* (2020) since these authors use the previous ENGHo (corresponding to the years 2012 and 2013) where the social tariff did not exist.

[27]For the current social tariff scheme for electricity, see for example, Edenor and Edesur. See Table A3 for the estimates and coverage by deciles of the social tariff in each jurisdiction. It is worth noting that, in line with Giuliano *et al.* (2020), our estimates indicate that the social tariff is relatively pro-poor, with significantly higher coverage among the poorest households. There are some exclusion errors in the low-income deciles and large inclusion errors in the medium- and high-income deciles.

[28]See Table A1 for further details. The average consumption (Kwh per month) draws from ADEERA (total residential consumption over total residential users).

4.3 Distributional analysis

We rely on the standard *"benefit-incidence analysis"*(van de Walle, 1998; Demery, 2000; Bourguignon & Pereira da Silva, 2003; Giuliano *et al.*, 2020). This methodology involves three basic steps: (i) order individuals or households by a welfare indicator (i.e., per capita household income in our case[29]); (ii) adopt identification assumptions and estimate the beneficiaries of subsidies (consumers of electricity and beneficiaries of the social tariff); and (iii) measure the distribution of the subsidies according to the distribution of beneficiaries obtained in (ii). We then compute the traditional indicators of distributional incidence (i.e., concentration index, Kakwani index, and Reynolds-Smolensky index).

Finally, we consider the distributive incidence under alternative financing schemes - although naturally not exhaustive as they are selected to just illustrate the point-. Here it is important to note that a share of the electricity subsidies is already financed with VAT (i.e., collected through the same electricity bill as mentioned in Section 2). This is approximately 25 percent of the total subsidy amount. The remaining 75 percent, in our microsimulations, is assumed to be financed in two alternative ways. First, we assume that subsidies are financed via general VAT (i.e., over most goods and services as Argentina implements in practice). So, we rely on the standard translation assumptions: VAT is supported by final consumers as in Fernández Felices *et al.* (2016). Thus, we distribute the tax using the total household expenditure on goods and services.[30] Second, we assume the case in which the spending on electricity subsidies displaces other redistributive spending, such as spending on education.[31] To do this, we distribute the spending on education that would have to be resigned to finance the subsidies based on the number of attendees at the public school in each jurisdiction.[32] This analysis follows those suggested in Gasparini *et al.* (2014).

[29]In our case, deciles of individuals ordered by per capita familiar income (pcfi) are created for each jurisdiction. That is, we do not use deciles at the country level. Note that we use the income directly reported in the survey, without correcting for underreporting. This is based on the imperfections that the correction methods have in Argentina, which can introduce further distortions. For a discussion of this issue see Gasparini *et al.* (2014).

[30]Specifically, we use the variable of total expenditure on purchases of goods and services (i.e., gascomp) in the ENGHo 2017/18.

[31]Here it is important to keep in mind that in practice the national government is in charge of the subsidy financing, while the provision of education relies mostly on the subnational jurisdictions. However, they are connected as the financing of education is a shared responsibility for the two levels of government: the National Education Law establishes a target of 6 percent of GDP for the aggregate spending. The subnational jurisdictions also finance education with taxes distributed via the revenue-sharing regime. Interestingly, the target of 6 percent has not been met in most of the years since it was established in 2006; in particular, in 2018 the aggregate spending was 5.1 percent of GDP (Narodowski, 2023). That is, 0.9 percent of GDP lower, which is the approximately amount of the energy subsidy (see Figure 1).

[32]Specifically, individuals who attend state educational establishments (i.e., variable cp19=1) from kindergarten to secondary school (i.e., variable cp20) are identified in the ENGHo 2017/18.

5 Results

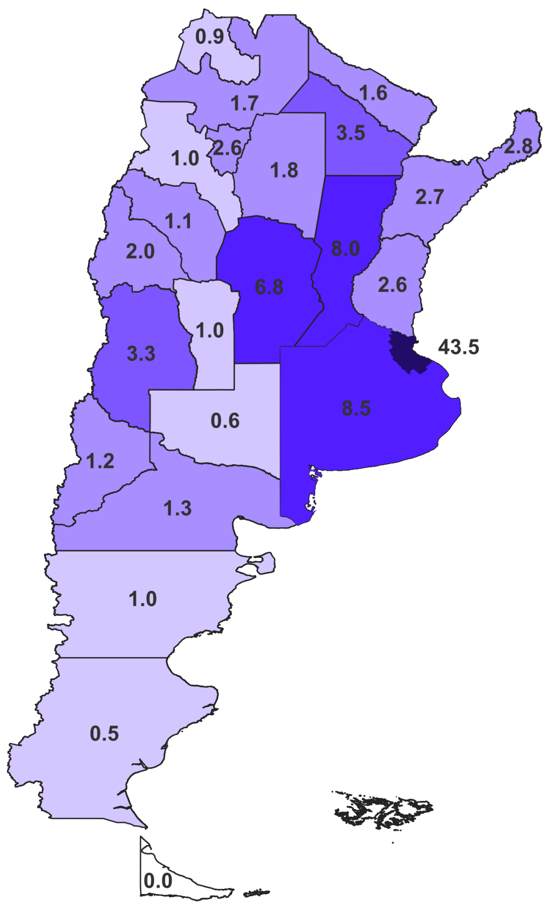
5.1 Costs, prices and subsidies for electricity at the regional level

We began by presenting the unit price of electricity of $1.17 paid by distributors in the WEM and the unit cost of $2.20 of generation and transmission (see Section 4 and Table 1). Consequently, the Argentine state covered the difference of $1.03 with electricity subsidies in 2018. Thus, each jurisdiction appropriates a subsidy according to its share in total consumption of electricity. In 2018, the total electricity consumption in Argentina was 129,985,405 Mwh, of which 61,461,819 Mwh were consumed by residential users, which is the focus of this paper. As a share of GDP total electricity subsidies represented 0.9 percent (i.e., 14,744,811 million pesos in 2018). This is in line with what is documented by the Secretary of Energy Ministry of Energy (2019). The subsidy for residential consumption represented 0.4 percent of GDP. Figure 2 shows the distribution by province of this subsidy. In line with the distribution of total consumption, 43.5 percent was received by the AMBA. The rest of the province of Buenos Aires received 8.5 percent of the total subsidies. Then, Santa Fe, Cordoba, and Mendoza received 8.0, 6.8, and 3.3 percent, respectively. Chaco received 3.5 percent, and the rest of the provinces participated with less than 3.0 percent each.

As mentioned in Section 4, both the distribution companies' costs and the final prices may differ between jurisdictions due to multiple factors. Table 1 shows these variables, on average. It can be appreciated that the distribution stage introduces regional disparities. For example, in the case of AMBA, the cost of one Kwh increases to $3.11 (i.e., close to 40 percent) as a consequence of the $0.91 corresponding to the VAD. This VAD was close to $2.0 in Cordoba and Santa Fe. The final price paid by households with no access to the social tariff in AMBA was, on average, $2.08 pesos and covered around 67 percent of the cost. This estimate is much in line with the official information (Ministry of Energy, 2019). The cost coverage exceeded 75 percent in Jujuy and Santa Fe. The final price for those users who access to the social tariff subsidy (i.e., near 30 percent of households[33]) was $1.33 in AMBA. Thus, a user with a social tariff in Cordoba (Jujuy) paid close to 83 (50) percent of the price paid by a user without a social tariff. By combining the different prices and quantities by jurisdiction the different types of subsidies can be determined (not shown in Table 4): the social tariff subsidy represented around 25 percent of total subsidies, on average. The remaining (i.e., 75 percent on average) corresponded to the generation stage subsidy in the WEM.

[33] See Table A3 for the estimates and coverage by deciles of the social tariff in each jurisdiction. It is worth mentioning that our estimate for AMBA is in line with what was found in Giuliano *et al.* (2020).

Figure 2: General subsidy for generation and transmission in the WEM. Distribution between provinces 2018. In percentage



Source: Author's elaboration based on ADEERA and CAMMESA.

Table 1: Cost ($/Kwh), Prices ($/Kwh) and Consumption (Mwh) of Electricity. Overall country and selected jurisdictions, 2018

Jurisdiction	Supply				Demand			Consumption	
	Gen. & Trans.		Dist.	Total	Prices			Quantities	
	Cost	Price	VAD		No ST	ST	Mean	Residential	Total
Amba	2.20	1.17	0.91	3.11	2.08	1.33	1.85	26,756,393	50,556,886
Cordoba	2.20	1.17	1.98	4.18	3.15	2.63	2.90	4,177,593	9,912,069
Corrientes	2.20	1.17	1.26	3.46	2.43	1.24	1.84	1,666,582	2,872,866
Jujuy	2.20	1.17	1.47	3.67	2.64	1.34	2.14	543,771	1,098,396
Mendoza	2.20	1.17	1.24	3.44	2.41	1.59	2.12	2,017,382	5,658,965
Rio Negro	2.20	1.17	0.96	3.16	2.13	1.27	1.82	807,834	1,936,416
Santa Fe	2.20	1.17	2.09	4.29	3.26	2.46	2.91	4,908,732	12,662,734
Overall country								61,461,819	129,985,405

Source: Author's elaboration based on ADEERA, CAMMESA, and provincial companies of electricity distribution. *Notes*: Prices (No) ST corresponds to the mean price paid by those users that were (not) beneficiaries of the social tariff. Price Mean corresponds to the mean price paid by all users.

5.2 Distributional effects of electricity subsidies

Table 2 reports some standard distributive indicators. We consider the generation and transmission stage (Panel A) as well as the distribution stage (Panel B). The subsidy concentration coefficient measures the degree of concentration of benefits in the lower deciles of income distribution. A negative value indicates a pro-poor subsidy. That is, as the poorest households receive a higher share of the subsidy, the absolute value of the concentration coefficient increases. The concentration coefficient for electricity subsidies results is positive in all jurisdictions. In addition, it is important to note that when considering all the stages (Panel B), the coefficient, although still positive, is lower than the one in which the distribution costs are not considered (Panel A). This is because this stage of the electricity supply chain sets prices with some redistributive consideration (i.e., higher levels of consumption paying higher fixed and marginal charges). In any case, the positive concentration index confirms the well-established middle to high-income bias (Hancevic *et al.*, 2016; Giuliano *et al.*, 2020) for all jurisdictions.

A second distributive indicator is presented to measure the progressivity of the subsidy. The Kakwani coefficient measures the difference between subsidies concentration coefficient and the Gini coefficient of income before subsidies. Negative (positive) values represent a progressive (regressive) subsidy, and therefore a more equitable income distribution. In all cases, the Kakwani coefficient is negative reinforcing another well-established result: electricity subsidies are progressive (Giuliano *et al.*, 2020). Regarding the Reynolds-Smolensky index, it can be appreciated that in all cases income inequality is reduced, in line with a progressive fiscal policy. Again, the reduction is more pronounced when the electricity distribution stage is considered.

In a complementary way, Figure 3 shows the distributional results by deciles, and in terms of absolute incidence and relative to the share of each decile in total welfare (i.e., income). The Figure 3 corresponds to the case with all stages of the electrical chain, since it is the one that ultimately impacts households. Leaks in the absolute distribution of subsidies (i.e., bars that denote targeting) as well as the subsidies' progressivity (i.e., dotted lines that denote relative incidence) can be appreciated in all jurisdictions.

Table 2: Indicators on the distributional incidence of electricity subsidies in Argentina. Selected jurisdictions, 2018

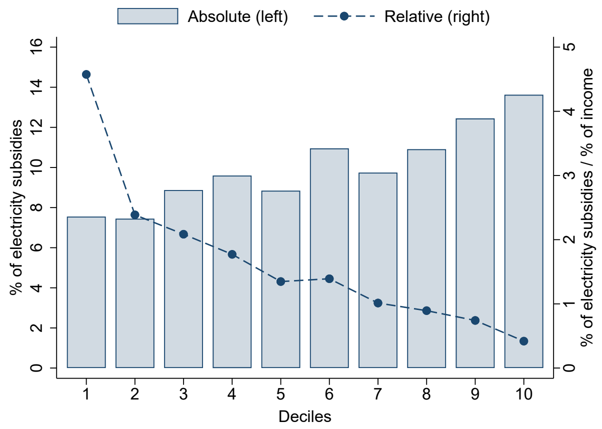
	Panel A. General subsidy for generation and transmission in the WEM						
Measures	AMBA	Cordoba	Corrientes	Jujuy	Mendoza	Rio Negro	Santa Fe
Pre-tax Gini	0.438	0.397	0.407	0.385	0.406	0.424	0.414
Post-tax Gini	0.435	0.395	0.405	0.384	0.404	0.423	0.412
Reynolds-Smolensky	0.002	0.002	0.002	0.002	0.002	0.001	0.002
Kakwani	-0.294	-0.247	-0.202	-0.200	-0.265	-0.229	-0.222
Concentration	0.143	0.150	0.205	0.184	0.141	0.195	0.191

	Panel B. Total subsidy when adding the VAD in the distribution stage						
Measures	AMBA	Cordoba	Corrientes	Jujuy	Mendoza	Rio Negro	Santa Fe
Pre-tax Gini	0.438	0.397	0.407	0.385	0.406	0.424	0.414
Post-tax Gini	0.435	0.393	0.404	0.382	0.403	0.421	0.411
Reynolds-Smolensky	0.003	0.004	0.004	0.003	0.003	0.003	0.003
Kakwani	-0.335	-0.287	-0.258	-0.260	-0.309	-0.315	-0.290
Concentration	0.102	0.110	0.149	0.124	0.097	0.108	0.123

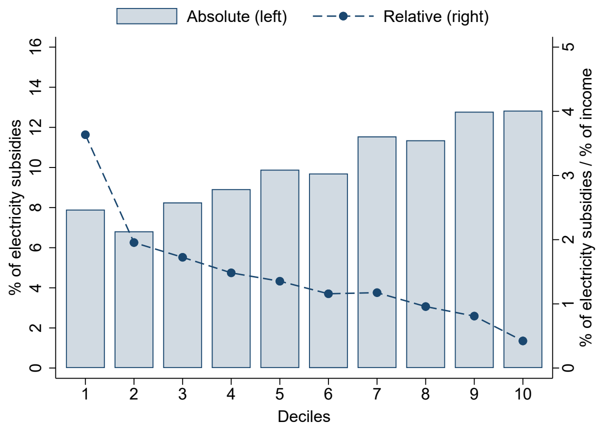
Source: Own elaboration based on ENGHo 2017/18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

Figure 3: Distributional incidence of electricity subsidies in Argentina. By deciles of per capita income. Selected jurisdictions, 2018. In absolute and relative terms

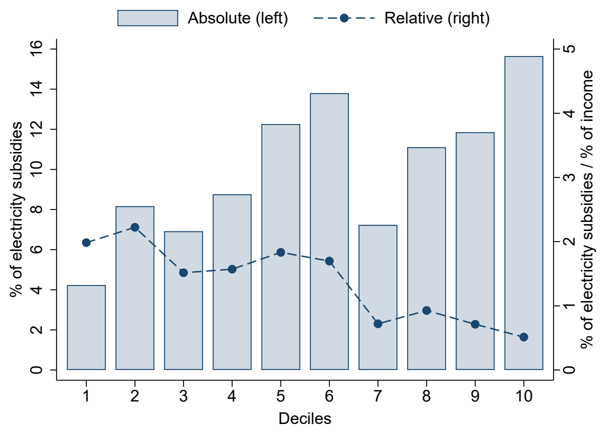
(a) AMBA



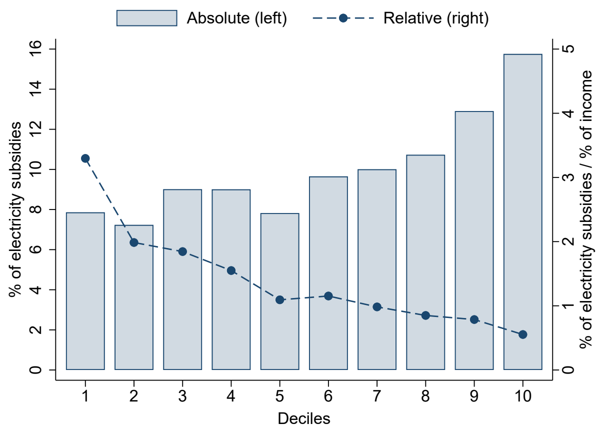
(b) Cordoba



(c) Corrientes



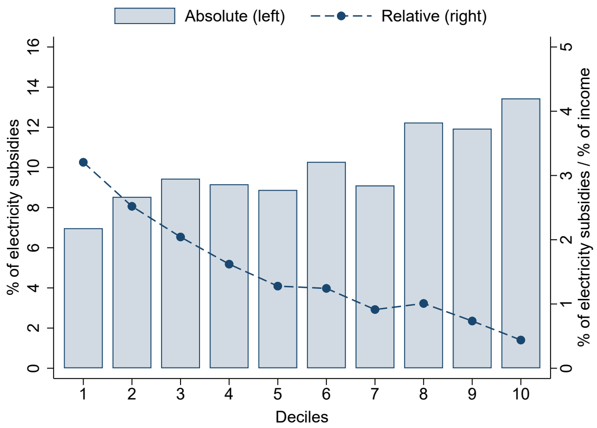
(d) Jujuy



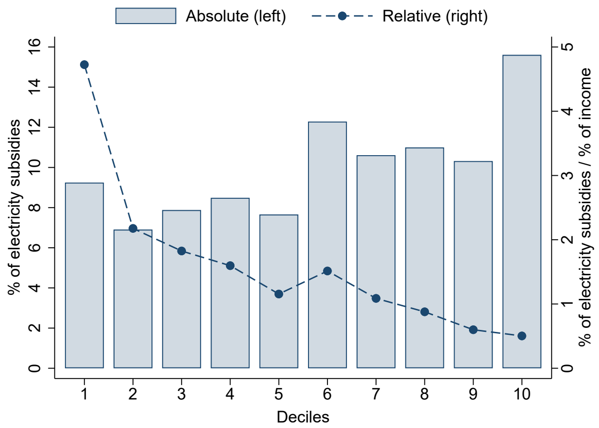
Source: Own elaboration based on ENGHo 2017-18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

Figure 3 (Cont.): Distributional incidence of electricity subsidies in Argentina. By deciles of per capita income. Selected jurisdictions, 2018. In absolute and relative terms

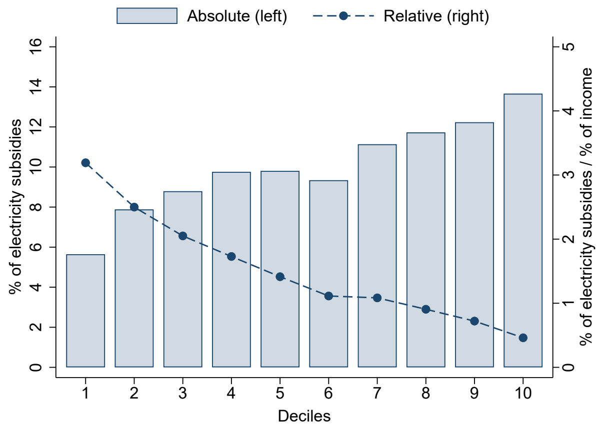
(e) Mendoza



(f) Rio Negro



(g) Santa Fe



Source: Own elaboration based on ENGHo 2017-18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

5.3 Distributional effects and the role of public financing

Now, the net incidence of subsidies is estimated considering public financing.[34] In line with Section 4's description, we first assume that the subsidies are financed through the general VAT.[35] Figure 4 presents the net effect, calculated as a share of the income after fiscal policy.[36] For example, in the case of AMBA, it can be appreciated for the poorest decile that a household receives an average of 4.1 percent of its income in terms of electricity subsidies. In turn, it contributes to the financing of the subsidies with 1.1 percent of its income in terms of VAT associated with electricity consumption (i.e., VAT Elect.), and 1.1 percent of VAT associated with the consumption of other taxed goods (i.e., VAT Gral.). In net terms, the average poorest household in AMBA gains 1.9 percent of its income (i.e., Overall Effect). That is, less than half of what it gains solely from subsidies. Note that this benefit's reduction is true for all deciles in all jurisdictions. Thus, when considering financing the well-established result on progressivity of electricity subsidies in AMBA (Hancevic *et al.*, 2016; Giuliano *et al.*, 2020) is strongly attenuated. The same corollary applies to the rest of jurisdictions.

Second, we assume that the remaining financing is made through a reduction of spending on basic education.[37] Figure 5 presents the net effect for this case. Note now that when considering this way of financing, the progressivity of electricity subsidies vanishes. Even more, the policy becomes regressive. For example, in the case of AMBA, it can be appreciated that a household in the poorest decile receives an average of 4.4 percent of its income in terms of electricity subsidies.[38] In turn, it contributes to the subsidies' financing with 1.2 percent of its income in terms of VAT associated with electricity consumption (i.e., VAT Elect.), and 9.2 percent of spending associated with the benefits of public education (i.e., Educ. Spending). In net terms, the average poorest household in AMBA loses 6.0 percent of its income (i.e., Overall Effect). This is also valid for all deciles in most of the jurisdictions, but the relative reduction is higher at the bottom of the income distribution. These results show the relevance of considering not only the subsidy but also how it is financed at the time of studying distributional incidence: omitting subsidies' financing may lead to overestimating the belief about their redistributive

[34] Please note that these exercises are not intended to be precise representations of reality but serve an illustrative purpose on the relevance of the topic.

[35] For our estimation on the distributional incidence of this general VAT, see Figure A11 in Appendix A7.

[36] As the aim of the paper is to make the point that someone finances the subsidy, we use this simple post-fiscal metric, but another metric such as the disposable or consumable income -like those estimated by Lustig & Pessino (2013)- are also perfectly valid. We are aware that our choice does not come free of potential biases (i.e., the positioning of the household in the welfare distribution may be biased and the net incidence measure, for example for subsidy-to-VAT, could have a different magnitude for the lowest deciles).

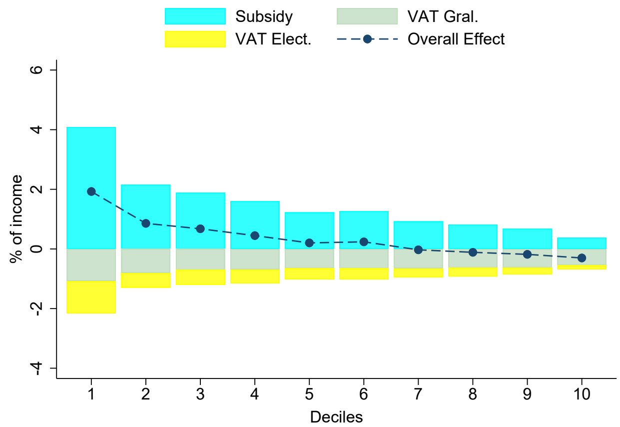
[37] For our estimation on the distributional incidence of this spending on education, see Figure A12 in Appendix A8.

[38] Note that this share slightly differs from the previous case since the effects are expressed in relation to post-fiscal policy income, which is naturally different for each type of policy and the participation of each decile in it.

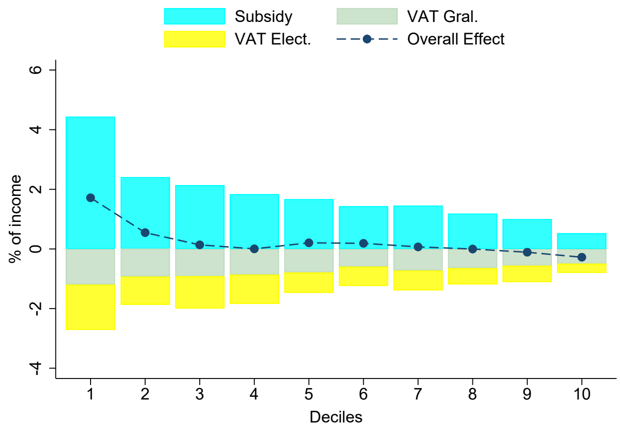
effect.

Figure 4: Net distributional incidence of electricity subsidies in Argentina when considering public financing through general VAT. By deciles of per capita income. Selected jurisdictions, 2018. In percentage of post -fiscal policy-income

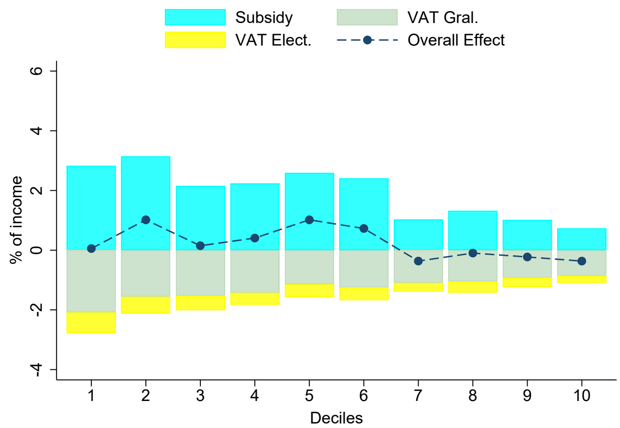
(a) AMBA



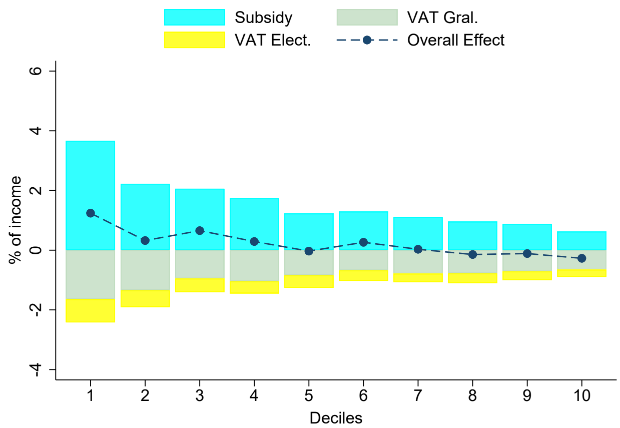
(b) Cordoba



(c) Corrientes



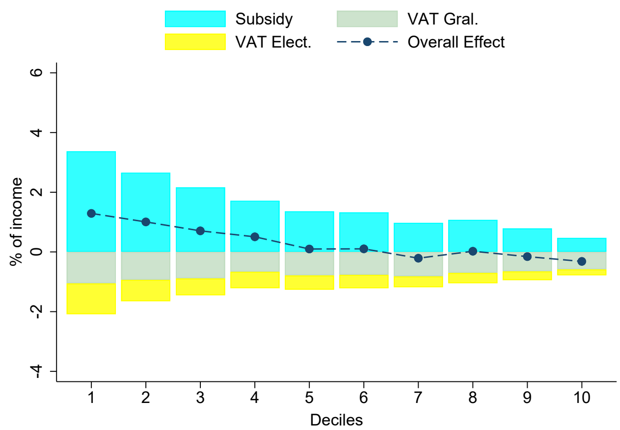
(d) Jujuy



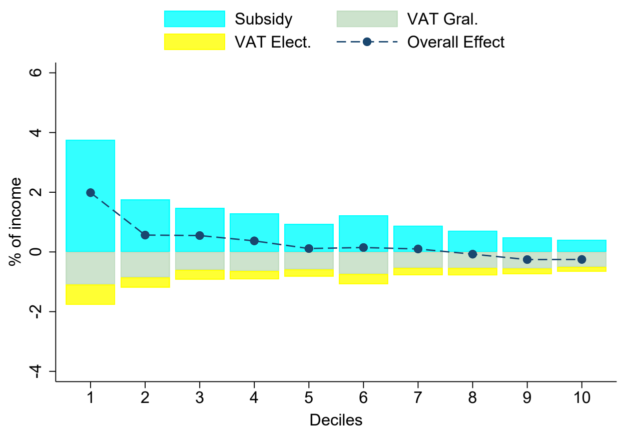
Source: Own elaboration based on ENGHo 2017-18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

Figure 4 (Cont.): Net distributional incidence of electricity subsidies in Argentina when considering public financing through general VAT. By deciles of per capita income. Selected jurisdictions, 2018. In percentage of post -fiscal policy-income

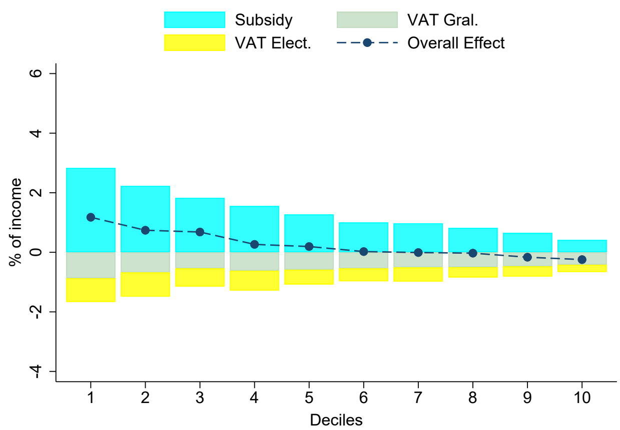
(e) Mendoza



(f) Rio Negro

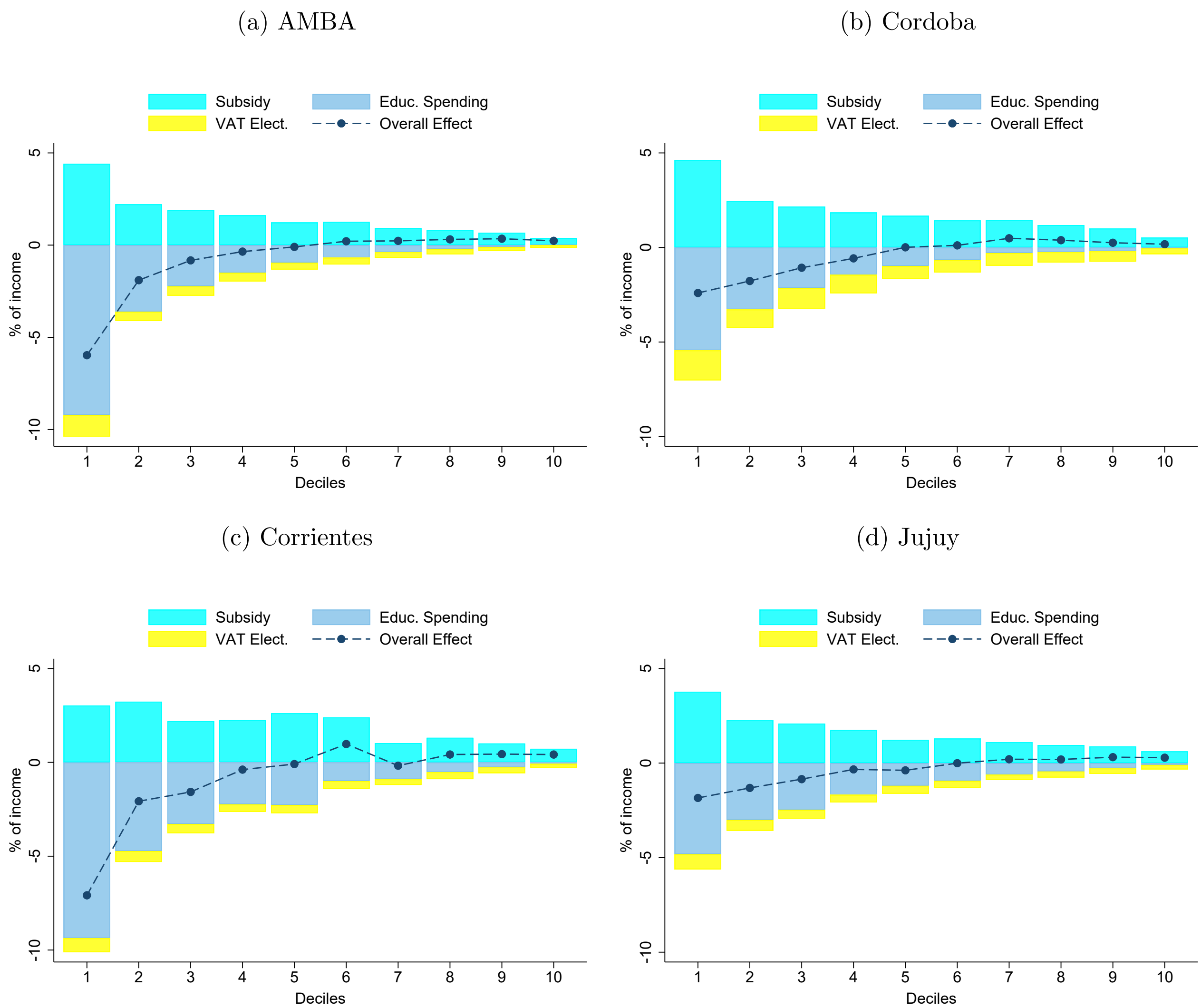


(g) Santa Fe



Source: Own elaboration based on ENGHo 2017-18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

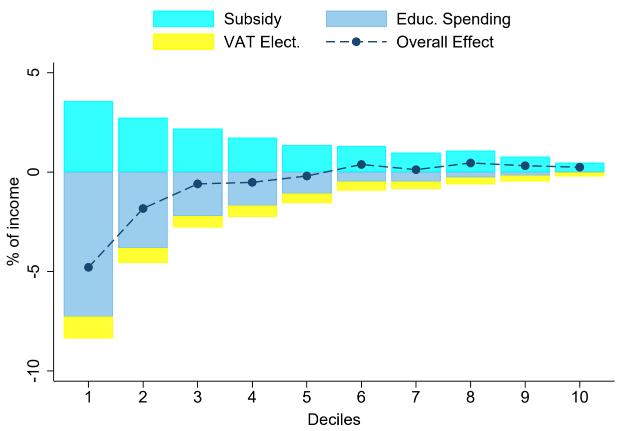
Figure 5: Net distributional incidence of electricity subsidies in Argentina when considering public financing through spending in education. By deciles of per capita income. Selected jurisdictions, 2018. In percentage of post -fiscal policy-income



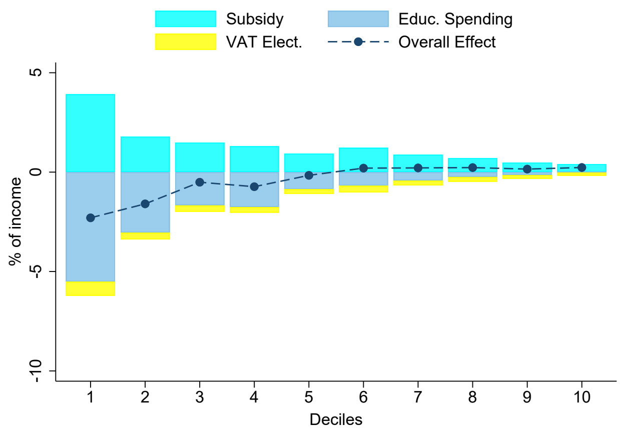
Source: Own elaboration based on ENGHo 2017-18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

Figure 5 (Cont.): Net distributional incidence of electricity subsidies in Argentina when considering public financing through spending in education. By deciles of per capita income. Selected jurisdictions, 2018. In percentage of post -fiscal policy-income

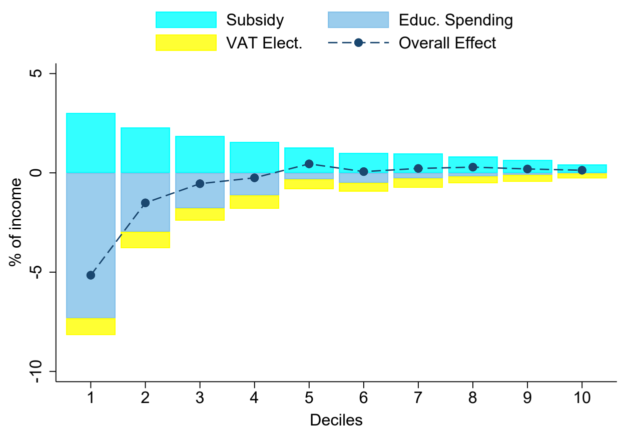
(e) Mendoza



(f) Rio Negro



(g) Santa Fe



Source: Own elaboration based on ENGHo 2017-18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

6 Conclusions

In this paper, we review the distributional incidence of electricity subsidies. We use the attractive case of Argentina, a developing country that has experienced a massive subsidy policy in recent decades. Using data from multiple sources, we explore two central dimensions, usually omitted in previous research. On the one hand, regional disparities, as previous studies mainly focus on AMBA. Argentina's territorial heterogeneity demands further analysis of other jurisdictions, given that electricity distribution introduces disparities between them. On the other hand, the subsidies' financing as previous studies do not focus on the net incidence. Our results indicate that: i) the jurisdictions benefit from subsidies according to their share in total electricity consumption; ii) regional disparities in the costs of electricity distribution and in the prices set by the distribution companies are key drivers for the distributional incidence; iii) omitting subsidies' financing lead to overestimating the belief about their redistributive effect; iv) when financing comes from a general consumption tax, progressivity is strongly attenuated, but when it comes from a decrease in spending on basic education, progressivity disappears or becomes regressive.

The last result allows us to introduce a final digression on the welfare effects of subsidies when considering a welfare function as defined by Sen & Foster (1973): $W = \bar{y} * (1 - G)$; where $\bar{y}$ is the average income and G is the inequality coefficient (i.e., Gini). Here, W increases with $\bar{y}$ and decreases with G. Considering the cases studied in this paper, in those where financing is omitted, $\bar{y}$ increases and G improves. If financing is included, $\bar{y}$ remains constant and the overall welfare effect depends on G. In these cases, fully understanding how inequality moves is crucial for the final ruling on the distributive impact of subsidies.

The lessons also apply to other financing alternatives. For example, Argentina is currently experimenting with high inflation which can be considered as another source of financing for the subsidies. Although not explored in this paper, assuming that inflation is regressive, conclusions can be drawn based on what is found in this paper. As a whole, the results are informative on the social and economic impacts of energy policies not only for Argentina but also for other developing countries that are dealing with energy subsidies.

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Appendix

A1 Data sources on electricity costs

Data on electricity cost in the wholesale electricity market (WEM) draw from CAMMESA. See annual reports in this link. To obtain the value added of distribution (VAD), the ideal would be to have this information from all distribution companies. Unfortunately, not all of them publish this data. Therefore, as a first step, the VAD was estimated as the difference between the price paid by final users without social tariff -net of taxes- (see Prices No ST in Table 1) and the price paid by distribution companies in WEM (i.e., 1.17 $/Kwh, see page 10 in the main text). Note that total costs involve costs of generation and transmission and those of distribution. The corresponding values for the VAD are shown in Table 1.

For AMBA and Mendoza information on distribution cost is available. Thus, as an attempt to cross check our previous figures, the VAD was calculated by combining the tables on companies' own distribution costs, administrative data on consumption, and the number of users by consumption category. The tables on companies' own distribution costs (different from the tariff charts for final users) establish a fixed cost according to the users' consumption bracket (i.e., consumption category) and a variable cost depending on the level of consumption. See Figures A1 and A2 for an example on these tables. The unitary cost of distribution via this method gave us very similar values. Specifically, in AMBA the estimated VAD was 0.91 pesos and in Mendoza 1.24 pesos. In the case of AMBA, the tables on companies' own distribution costs draw from ENRE's (National Electricity Regulatory Entity) Resolution Nº 32 and Resolution Nº 33 of 2018. In the case of Mendoza, the source is Resolution Nº 106 of 2018, published by the EPRE (Provincial Electrical Regulatory Entity).

Figure A1: Example of tables on companies' own distribution costs. Edenor

ANEXO I a la Resolución ENRE N° 33/2018.

Costos Propios de Distribución

vigencia a partir de 1° de febrero de 2018

		EDENOR	
hasta 150	CDFR1	23,63	$/mes
	CDVR1	0,231	$/kWh
151 a 325	CDFR2	44,48	$/mes
	CDVR2	0,231	$/kWh
326 a 400	CDFR3	76,44	$/mes
	CDVR3	0,277	$/kWh
401 a 450	CDFR4	90,34	$/mes
	CDVR4	0,346	$/kWh
451 a 500	CDFR5	138,98	$/mes
	CDVR5	0,415	$/kWh
501 a 600	CDFR6	277,97	$/mes
	CDVR6	0,461	$/kWh
601 a 700	CDFR7	732,35	$/mes
	CDVR7	0,582	$/kWh
701 a 1400	CDFR8	976,47	$/mes
	CDVR8	0,642	$/kWh
más de 1400	CDFR9	1220,58	$/mes
	CDVR9	0,661	$/kWh

Source: ENRE

Figure A2: Example of tables on companies' own distribution costs. EPRE

ANEXO III RES. EPRE Nº 106 / 18

Cuadro Tarifario de VAD a Usuario Final (VADRUF)

Vigencia: a partir del 01 de agosto de 2018

Tarifa 1 (T1) - PEQUEÑAS DEMANDAS (Potencias hasta 10 kW)

RESIDENCIAL (R)

Residencial 1 (Hasta 299 kWh/Bim)

		Sin Plan Estímulo ni Tarifa Social	Plan Estímulo (Ahorro >=20%)	Tarifa Social <300 kWh/bim	Electrodependiente salud <300
Cargo Fijo	$/bim	18,249	18,249	18,249	18,249
Cargo Variable	$/kWh	0,3082	0,3082	0,3082	0,3082
Facturación Mínima 45 kWh/bim					

Residencial 2 (entre 300 y 599 kWh/Bim)

		Sin Plan Estímulo ni Tarifa Social	Plan Estímulo (Ahorro >=20%)	Electrodependiente salud <600
Cargo Fijo	$/bim	35,681	35,681	35,681
Cargo Variable	$/kWh	0,6636	0,6636	0,6636

		Tarifa Social Con Plan	Tarifa Social Sin Plan Estímulo
Cargo Fijo	$/bim	35,681	35,681
C. Var. hasta 300 kWh bim	$/kWh	0,6636	0,6636
C. Var. a partir de 301 kWh bim	$/kWh	0,6636	0,6636

Residencial 3 (mayor igual a 600 kWh/Bim)

		Sin Plan Estímulo ni Tarifa Social	Plan Estímulo (Ahorro >=20%)
Cargo Fijo	$/bim	219,052	219,052
Cargo Variable	$/kWh	0,7083	0,7083

		Tarifa Social Con Plan Estímulo	Tarifa Social Sin Plan Estímulo
Cargo Fijo	$/bim	219,052	219,052
C. Var. hasta 300 kWh bim	$/kWh	0,7083	0,7083
C. Var. desde 301 hasta 600 kWh	$/kWh	0,7083	0,7083
C. Var. a partir de 601 kWh bim	$/kWh	0,7083	0,7083

		Electrodependiente cuestiones de salud
Cargo Fijo	$/bim	219,052
Cargo Variable	$/kWh	0,7083

GENERAL (G)

		T1 G
Cargo Fijo	$/bim	151,764
Cargo Variable	$/kWh	1,2248

ALUMBRADO PUBLICO (ALP)

		T1 ALP
Cargo Variable	$/kWh	0,7761

Tarifa 2 (T2) - GRANDES DEMANDAS (Potencias mayores a 10 kW)

CONECTADO A LA RED DE DISTRIBUCIÓN y BORNES DEL TRANSFORMADOR

		T2 R BT		T2 B MT/BT		T2 R MT		T2 B AT/MT		T2 R AT	
		Pot. entre 10 kW y 300 kW	Pot. desde 300 kW	Pot. entre 10 kW y 300 kW	Pot. desde 300 kW	Pot. entre 10 kW y 300 kW	Pot. desde 300 kW	Pot. entre 10 kW y 300 kW	Pot. desde 300 kW	Pot. entre 10 kW y 300 kW	Pot. desde 300 kW
CARGO COMERCIALIZACIÓN	$/mes	323,001	323,001	477,538	477,538	4755,003	4755,003	6418,719	6418,719	20948,435	20948,435
USO DE RED	$/kW-mes	478,862	478,862	402,803	402,803	375,549	375,549	288,969	288,969	207,086	207,086
CONSUMO DE POTENCIA	$/kW-mes	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
CONSUMO DE ENERGÍA											
-PICO (P) - 18 a 23hs.	$/kWh	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
-RESTO (R) - 05 a 18hs.	$/kWh	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
-VALLE (V) - 23 a 05hs.	$/kWh	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000

		T2 Especial Potencias hasta 50 kW
Cargo Comercialización	$/mes	172,429
Cargo Fijo	$/mes	63,962
Cargo Variable	$/kWh	1,4184

Tarifa - RIEGO AGRICOLA (RA)

		Tarifa de Referencia (2) (1)				Pago DISTRIBUIDORA (3)			
		TRA BT		TRA MT		TRA BT		TRA MT	
		Pot. hasta 300 kW	Pot. desde 300 kW	Pot. hasta 300 kW	Pot. desde 300 kW	Pot. hasta 300 kW	Pot. desde 300 kW	Pot. hasta 300 kW	Pot. desde 300 kW
CARGO FIJO	$/mes	----------	----------	----------	----------	379,941	379,941	3619,897	3619,897
USO DE RED	$/kW-mes	----------	----------	----------	----------	48,293	48,293	31,246	31,246
CONSUMO DE ENERGÍA									
-Alta (de 14 a 23 hs.)	$/kWh					0,6336	0,6336	0,3847	0,3847
-Baja (de 23 a 14 hs.)	$/kWh					0,0000	0,0000	0,0000	0,0000

(1) - La factura mínima es la equivalente a un consumo de 289 kWh en baja en el nivel de tensión que corresponda de la Tarifa Pago Distribuidora

(2) - La "Tarifa de Referencia" es la que paga el usuario.

(3) - La "Tarifa Pago a Distribuidora" es la que recibe la distribuidora por prestar el servicio eléctrico.

Tarifa - PEAJE

CONECTADO A LA RED DE DISTRIBUCIÓN y BORNES DEL TRANSFORMADOR

		TP BT		TP MT/BT		TP MT		TP AT/MT		TP AT	
		Pot. mayores a 10 kW y menores a 300	Pot. desde 300 kW	Pot. mayores a 10 kW y menores a 300	Pot. desde 300 kW	Pot. mayores a 10 kW y menores a 300 kW	Pot. desde 300 kW	Pot. mayores a 10 kW y menores 300	Pot. desde 300 kW	Pot. mayores a 10 kW y menores 300	Pot. desde 300 kW
USO DE RED	$/kW-mes	478,862	478,862	402,803	402,803	375,549	375,549	288,969	288,969	207,086	207,086
CONSUMO DE POTENCIA	$/kW-mes	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
TRANSP. DE OTROS AGENT	$/kW-mes	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
CONSUMO DE ENERGÍA											
-PICO (P) - 18 a 23hs.	$/kWh	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
-RESTO (R) - 05 a 18hs.	$/kWh	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
-VALLE (V) - 23 a 05hs.	$/kWh	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000

BT: Baja Tensión; MT: Media Tensión; AT: Alta Tensión.

Source: EPRE

A2 Tariff charts for residential electricity consumption

Figure A3: AMBA

Cuadro Tarifario - Período 04/18.

Usuarios Residenciales - Entidades Bien Público

Tarifa 1 -R1		EDENOR	EDESUR
Cargo Fijo 0-150	$/mes	28,43	30,41
Cargo Variable 0-150	$/kWh	1,490	1,489
Tarifa 1 -R2		**EDENOR**	**EDESUR**
Cargo Fijo 151-325	$/mes	50,65	51,99
Cargo Variable 151-325	$/kWh	1,487	1,487
Tarifa 1 -R3		**EDENOR**	**EDESUR**
Cargo Fijo 326-400	$/mes	84,63	85,00
Cargo Variable 326-400	$/kWh	1,538	1,537
Tarifa 1 -R4		**EDENOR**	**EDESUR**
Cargo Fijo 401-450	$/mes	99,59	99,45
Cargo Variable 401-450	$/kWh	1,612	1,611

Tarifa 1 -R6		EDENOR	EDESUR
Cargo Fijo 501-600	$/mes	298,30	292,80
Cargo Variable 501-600	$/kWh	1,736	1,735
Tarifa 1 -R7		**EDENOR**	**EDESUR**
Cargo Fijo 601-700	$/mes	777,56	787,80
Cargo Variable 601-700	$/kWh	1,868	2,097
Tarifa 1 -R8		**EDENOR**	**EDESUR**
Cargo Fijo 701-1400	$/mes	1.115,99	1.115,26
Cargo Variable 701-1400	$/kWh	1,968	2,192
Tarifa 1 -R9		**EDENOR**	**EDESUR**
Cargo Fijo +1400	$/mes	1.343,79	1.336,93
Cargo Variable + 1400	$/kWh	1,992	2,216

Source: ENRE. *Notes*: The Figure is illustrative. All tariff charts that cover the same period as the ENGHo 2017/18 microdata are used in the estimates. That is, those charts from November 2017 to November 2018. Quarterly tariff charts are constructed coinciding with the survey's quarters. Not all the used tariff charts are presented for reasons of brevity, but they are naturally available upon request.

Figure A4: Cordoba

No SOCIAL TARIFF

Quarter	Less than 80 kWh/month		between 80 y 120 kWh/month		between 120 y 500 kWh/month			
						Variable		
	Fixed	Variable	Fixed	Variable	Fixed	0 - 120 kWh/month	120 - 200 kWh/month	Más de 200 kWh/month
I	27.57	1.55	27.57	1.60	38.29	1.98	2.63	2.64
II	29.52	1.98	29.52	1.98	40.99	2.41	3.11	3.11
III	31.44	2.11	31.44	2.11	43.66	2.56	2.71	2.71
IV	35.88	2.62	35.88	2.62	49.83	3.14	3.99	3.99

Quarter	between 500 y 700 kWh/month					between 700 y 1400 kWh/month					Más de 1400 kWh/month				
		Variable					Variable					Variable			
	Fixed	0 - 120 kWh/month	120 - 200 kWh/month	200 - 500 kWh/month	Más de 500 kWh/month	Fixed	0 - 120 kWh/month	120 - 200 kWh/month	200 - 500 kWh/month	Más de 500 kWh/month	Fixed	0 - 120 kWh/month	120 - 200 kWh/month	200 - 500 kWh/month	Más de 500 kWh/month
I	55.65	2.38	3.03	3.07	3.08	55.65	2.69	3.38	3.42	3.49	55.65	2.87	3.58	3.62	3.62
II	59.57	2.84	3.57	3.57	3.57	59.57	3.18	4.01	4.01	4.01	59.57	3.18	4.01	4.01	4.01
III	63.45	3.02	3.80	3.80	3.80	63.45	3.39	4.27	4.27	4.27	63.45	3.39	4.27	4.27	4.27
IV	72.40	3.66	4.55	4.55	4.55	72.40	4.08	5.09	5.09	5.09	72.40	4.08	5.09	5.09	5.09

SOCIAL TARIFF

Quarter	0 - 80 kWh/month		80 - 120 kWh/month		between 120 y 500 kWh/month					
						Variable				
	Fixed	Variable	Fixed	Variable	Fixed	0 - 120 kWh/month	120 - 150 kWh/month	150 - 200 kWh/month	200 - 300 kWh/month	300 - 500 kWh/month
I	27.57	0.76	27.57	0.81	38.28	1.19	1.84	2.06	2.06	2.20
II	29.52	0.89	29.52	0.89	40.99	1.31	2.02	2.51	2.51	3.00
III	31.05	0.93	31.05	0.93	43.15	1.37	2.11	2.63	2.63	3.15
IV	34.67	1.04	34.67	1.04	48.15	1.53	2.35	3.01	3.01	3.67

Quarter	between 500 y 700 kWh/month						
		Variable					
	Fixed	0 - 120 kWh/month	120 - 150 kWh/month	150 - 200 kWh/month	200 - 300 kWh/month	300 - 500 kWh/month	500 - 700 kWh/month
I	55.65	1.59	2.25	2.45	2.49	2.64	2.65
II	59.57	1.74	2.48	2.97	2.97	3.46	3.46
III	62.69	1.83	2.59	3.11	3.11	3.96	3.96
IV	69.97	2.03	2.87	3.54	3.54	4.21	4.21

Quarter	between 700 - 1400 kWh/month							Más de 700 kWh/month						
		Variable							Variable					
	Fixed	0 - 120 kWh/month	120 - 150 kWh/month	150 - 200 kWh/month	200 - 300 kWh/month	300 - 500 kWh/month	500 - 1400 kWh/month	Fixed	0 - 120 kWh/month	120 - 150 kWh/month	150 - 200 kWh/month	200 - 300 kWh/month	300 - 500 kWh/month	Más de 500 kWh/month
I	55.65	1.90	2.59	2.79	2.83	2.98	3.05	55.65	2.08	2.78	2.99	3.03	3.17	3.18
II	59.57	2.09	2.92	3.41	3.41	3.90	3.90	59.57	2.09	2.92	3.41	3.41	3.90	3.90
III	62.69	2.19	3.06	3.57	3.57	4.42	4.42	62.69	2.19	3.06	3.57	3.57	4.42	4.42
IV	69.97	2.43	3.39	4.05	4.05	4.72	4.72	69.97	2.43	3.39	4.05	4.05	4.72	4.72

Source: EPEC. *Notes*: The Figure is illustrative. All tariff charts that cover the same period as the ENGHo 2017/18 microdata are used in the estimates. That is, those charts from November 2017 to November 2018. Quarterly tariff charts are constructed coinciding with the survey's quarters. Not all the used tariff charts are presented for reasons of brevity, but they are naturally available upon request.

Figure A5: Corrientes

SOCIAL TARIFF			
Quarter	Fixed $/bim	Variable 0 - 600 kWh/bim	More than600 kWh/bim
I	127.53	2.00	2.34
II	127.53	2.00	2.34
III	127.53	2.00	2.34
IV	125.94	2.33	2.66

NO SOCIAL TARIFF					
Quarter	Fixed $/bim	Variable 0 - 600 kWh/bim	600 - 900 kWh/bim	900 - 1500 kWh/bim	More than1500 kWh/bim
I	127.53	0.54	1.92	1.92	2.34
II	127.53	0.54	1.92	1.92	2.34
III	127.53	0.54	1.92	1.92	2.34
IV	125.94	0.54	2.06	2.38	2.66

Source: DPEC. *Notes*: The Figure is illustrative. All tariff charts that cover the same period as the ENGHo 2017/18 microdata are used in the estimates. That is, those charts from November 2017 to November 2018. Quarterly tariff charts are constructed coinciding with the survey's quarters. Not all the used tariff charts are presented for reasons of brevity, but they are naturally available upon request.

Figure A6: Jujuy

Vigencia: Desde el 1º de Febrero al 30 de Abril de 2018

TARIFA T1 **Pequeñas Demandas**	-	
T1-S Tarifa Social		
Cargo Fijo Tarifa Social	$/mes	65,25
Cargo Variable Tarifa Social (Primeros 150 kWh/mes)	$/kWh	0,2887
Cargo Variable Tarifa Social (Excedentes a 150 kWh/mes, sin superar los 300 kWh/mes)	$/kWh	2,0986
Cargo Variable Tarifa Social (Excedentes a 300 kWh/mes)	$/kWh	2,7050
Cargo Variable Tarifa Social (Excedentes a 150 kWh/mes, sin superar los 300 kWh/mes, si el consumo es un 20% menor con respecto a mismo mes de año 2015)	$/kWh	1,4721
Cargo Variable Tarifa Social (Excedentes a 300 kWh/mes, si el consumo es un 20% menor con respecto a mismo mes de año 2015)	$/kWh	2,0179
Electrodependientes		
Cargo Fijo		65,2500
Cargo Variable (Primeros 600 kWh/mes)		0,7276
Cargo Variable (Excedentes a 600 kWh/mes, si el consumo es menor o igual con respecto a mismo mes de año 2015)		1,2935
Cargo Variable (Excedentes a 600 kWh/mes, hasta 1050 kWh/mes, si el consumo es mayor con respecto a mismo mes de año 2015)		1,2935
Cargo Variable (Excedentes a 1050 kWh/mes, si el consumo es mayor con respecto a mismo mes de año 2015)		1,2935
T1R - Uso Residencial		
Cargo Fijo Residencial	$/mes	65,25
Cargo Variable por consumo de energía primeros 150 kWh mes	$/kWh	2,1410
Cargo Variable por consumo de energía excedentes a 150 kWh mes	$/kWh	2,7050

Source: EJESA. *Notes*: The Figure is illustrative. All tariff charts that cover the same period as the ENGHo 2017/18 microdata are used in the estimates. That is, those charts from November 2017 to November 2018. Quarterly tariff charts are constructed coinciding with the survey's quarters. Not all the used tariff charts are presented for reasons of brevity, but they are naturally available upon request.

Figure A7: Mendoza

NO SOCIAL TARIFF						
Quarter	Residential 1		Residential 2		Residential 3	
	Up to 299 kWh/bim		Between 300 and 599 kWh/bim		more than 600 kWh/bim	
	Fixed	Variable	Fixed	Variable	Fixed	Variable
	$/bim	$/kWh	$/bim	$/kWh	$/bim	$/kWh
I	15.74	1.04	31.59	1.31	200.10	1.33
II	18.35	1.43	36.43	1.76	227.71	1.79
III	18.88	1.61	37.35	1.96	232.51	1.99
IV	19.36	1.95	38.59	2.29	242.59	2.32

SOCIAL TARIFF									
Quarter	Residential 1		Residential 2			Residential 3			
	Up to 299 kWh/bim		Between 300 and 599 kWh/bim			more than 600 kWh/bim			
	Fixed	Variable	Fixed	Variable		Fixed	Variable		
				0 a 300	301 a 599		0 a 300	301 a 599	more than599
	$/bim	$/kWh	$/bim	$/kWh	$/kWh	$/bim	$/kWh	$/kWh	$/kWh
I	15.74	0.33	31.57	0.59	0.95	200.10	0.61	0.97	1.33
II	18.35	0.41	36.42	0.74	1.25	227.71	0.77	1.26	1.75
III	18.88	0.44	37.35	0.79	1.37	232.52	0.82	1.41	1.99
IV	19.36	0.49	38.59	0.84	1.56	242.59	0.86	1.59	2.32

Source: EDEMSA. *Notes*: The Figure is illustrative. All tariff charts that cover the same period as the ENGHo 2017/18 microdata are used in the estimates. That is, those charts from November 2017 to November 2018. Quarterly tariff charts are constructed coinciding with the survey's quarters. Not all the used tariff charts are presented for reasons of brevity, but they are naturally available upon request.

Figure A8: Rio Negro

E.P.R.E.
Ente Provincial Regulador de la Energía

RESOLUCIÓN Nº 215 EPRE
EXPTE. N° EPRE

ANEXO I
CUADRO TARIFARIO PROVINCIAL
Vigente para el período: 1º de diciembre de 2017 al 31 de enero de 2018

		Residencial		Tarifa Social y Electrodependientes				No Residencial	
			Con Ahorro mayor o igual a 20% al 2015		Electro dependientes	Tarifa Social (TS)	(TS) Con Ahorro mayor o igual a 20% al 2015	< 300 kW	>= 300 kW*
TARIFA 1 - PEQUEÑAS DEMANDAS									
T 1-R Uso residencial									
Cargo fijo (haya o no consumo)	$/mes	42,52	42,52	Cargo fijo (haya o no consumo) $/mes	42,52	42,52	42,52		
Cargo Variable por energía:	$/kWh								
Primeros 100 kWh/mes		1,7094	1,6038	Prim 150 kWh/mes	0,7369	0,7564	0,7564		
Siguientes 100 kWh/mes		2,0181	1,9125	Sig 50 kWh/mes	0,9427	1,4902	1,4374		
Siguientes 100 kWh/mes		2,9443	2,8387	Sig 100 kWh/mes	1,8689	2,4164	2,3636		
Excedente de 300 kWh/mes		3,4127	3,3071	Excedente de 300 kWh/mes	2,3374	3,4127	3,3071		
T 1-Rural Residencial									
Cargo fijo (haya o no consumo)	$/mes	117,80	117,80	Cargo fijo (haya o no consumo) $/mes	117,80	117,80	117,80		
Cargo Variable por energía:	$/kWh								
Primeros 150 kWh/mes		2,0060	1,9006	Prim 150 kWh/mes	0,9323	0,9517	0,9517		
Siguientes 150 kWh/mes		3,2729	3,1675	Sig 150 kWh/mes	2,1991	2,7458	2,6930		
Excedente de 300 kWh/mes		4,0820	3,9766	Excedente de 300 kWh/mes	3,0082	4,0820	3,9766		
T 1-Rural General									
Cargo fijo (haya o no consumo)	$/mes							117,80	
Cargo Variable por energía:	$/kWh								
Primeros 150 kWh/mes								2,0106	
Siguientes 150 kWh/mes								3,2881	
Excedente de 300 kWh/mes								3,5223	
T 1-G Uso General									
Cargo fijo (haya o no consumo)	$/mes							104,95	
Cargo Variable por energía:	$/kWh								
Primeros 125 kWh/mes								2,1405	
Siguientes 225 kWh/mes								2,7899	
Excedente de 350 kWh/mes								3,2370	
TARIFA 2 - MEDIANAS DEMANDAS									
Por capacidad de suministro contratada	$/kW-mes							159,07	
Cargo Variable por energía:	$/kWh							2,0586	

Source: EDERSA. *Notes*: The Figure is illustrative. All tariff charts that cover the same period as the ENGHo 2017/18 microdata are used in the estimates. That is, those charts from November 2017 to November 2018. Quarterly tariff charts are constructed coinciding with the survey's quarters. Not all the used tariff charts are presented for reasons of brevity, but they are naturally available upon request.

Figure A9: Santa Fe

EPE
Energía de Santa Fe

EMPRESA PROVINCIAL DE LA ENERGIA DE SANTA FE

Área de aplicación: Todo el territorio de la Provincia de Santa Fe
Consumos registrados entre el 01 y el 31 de ENERO de 2018
CUADRO TARIFARIO COMPLETO MENSUAL - FACTURACION BIMESTRAL

TARIFA PEQUEÑAS DEMANDAS URBANAS

TARIFA RESIDENCIAL - SIN AHORRO o CON AHORRO MENOR AL 20% RESPECTO DEL CONSUMO 2015

Tarifa 1 - Uso Residencial (menor de 20 kW)		Cuota de Servicio $/sum. Mes	Primeros 60 kWh/mes ($/kWh)	Siguientes 60 kWh/mes ($/kWh)	Excedente de 120 kWh/mes ($/kWh)
1J01	Residencial hasta 20 kW - CONSUMO hasta 120 kWh/mes para Jubilados y Pensionados	27,52581	0,80558	0,92612	
1001	Residencial hasta 20 kW - CONSUMO hasta 120 kWh/mes	55,05164	1,32364	1,56470	
1101 1201 1301 1401	Residencial hasta 20 kW - CONSUMO mayor a 120 kWh/mes hasta 700 kWh/mes	93,30478	1,55094	1,78348	2,73349
1501 1601	Residencial hasta 20 kW - CONSUMO superior a 700 kWh/mes	93,30478	2,00501	2,20814	3,01755

TARIFA RESIDENCIAL - CON AHORRO MAYOR O IGUAL A 20% RESPECTO CONSUMO 2015

Tarifa 1 - Uso Residencial (menor de 20 kW)		Cuota de Servicio $/sum. Mes	Primeros 60 kWh/mes ($/kWh)	Siguientes 60 kWh/mes ($/kWh)	Excedente de 120 kWh/mes ($/kWh)
1DC0	Residencial hasta 20 kW - CONSUMO hasta 120 kWh/mes para Jubilados y Pensionados	27,52581	0,70458	0,82512	
1AC0	Residencial hasta 20 kW - CONSUMO hasta 120 kWh/mes	55,05164	1,25836	1,49404	
1AC1 1AC2 1AC3 1AC4	Residencial hasta 20 kW - CONSUMO mayor a 120 kWh/mes hasta 700 kWh/mes	93,30478	1,44994	1,68248	2,63249
1AC5 1AC6	Residencial hasta 20 kW - CONSUMO superior a 700 kWh/mes	93,30478	1,90401	2,10714	2,91655

Source: EPESF. *Notes*: The Figure is illustrative. All tariff charts that cover the same period as the ENGHo 2017/18 microdata are used in the estimates. That is, those charts from November 2017 to November 2018. Quarterly tariff charts are constructed coinciding with the survey's quarters. Not all the used tariff charts are presented for reasons of brevity, but they are naturally available upon request.

A3 Distributors, users and consumption of residential electricity

Table A1: Distributors, users and consumption of residential electricity in Argentina. 2018

Distributor	Surface	Residencial [Kwh/bim]				Residencial [GWh/bim]			
	Km2	<= 1000	>1000 and <=1400	>1400 and <=2800	> 2800	<= 1000	>1000 and <=1400	>1400 and <=2800	> 2800
EDENOR	4637.0	2472838.0	97611.0	45261.0	4748.0	5451.8	1444.4	1516.2	369.6
EDESUR (datos 2017)	3304.0	2204501.0	14164.0	7533.0	862.0	6235.1	328.9	225.2	70.8
EPESF	133696.0	1151673.0	18729.0	9152.0	1372.0	2500.6	285.1	240.8	65.1
EPEC	165321.0	934480.0	13126.7	7093.7	1360.6	2973.0	143.6	112.1	34.9
EDEMSA	109908.0	355314.0	11874.0	7544.0	1221.0	770.5	138.0	153.8	61.5
ENERSA	56287.0	306504.0	13548.0	5939.0	413.0	674.2	94.1	62.5	9.2
EDEN	109141.0	290652.0	12299.8	10959.1	4252.1	583.3	55.4	48.4	27.2
EDELAP	5780.0	297851.0	6509.0	2642.0	337.0	623.3	100.0	87.2	23.9
EDET	22524.0	419918.0	32458.0	17150.0	1327.0	1014.2	223.8	179.8	31.1
EDEA	105438.0	468115.0	9926.0	6284.0	737.0	673.6	62.1	62.8	24.9
Servicios Públicos SE (2014)	63784.0	65395.0	2059.0	1090.0	252.0	189.8	30.1	29.2	21.8
EMSA (datos 2017)	16206.0	159111.0	23004.0	10494.0	1330.0	455.8	104.8	107.0	31.8
SECHEEP (datos 2014)	99633.0	223595.0	41911.0	45235.0	5940.0	663.6	226.0	331.3	91.3
ESJ SA	85226.0	180579.0	15940.0	10376.0	1902.0	450.7	163.3	233.8	112.9
EDESA	155488.0	284241.0	16260.2	10631.7	1563.5	636.7	114.9	118.6	34.7
EDESE	150536.0	209120.0	22612.0	11078.0	581.0	535.3	180.2	183.2	24.0
EDESAL	76748.0	154496.0	4571.0	2139.0	251.0	380.6	56.8	62.1	17.4
EPEN	90878.0	73288.0	2493.0	1403.0	380.0	143.6	28.4	23.6	14.7
EDELAR	89680.0	77415.0	20972.0	23982.0	3061.0	271.0	105.2	133.2	28.1
EDERSA (datos 2017)	203000.0	173850.5	6082.0	3242.7	705.3	346.2	44.3	35.6	17.8
EDES	76500.0	170841.9	2160.8	1123.5	184.9	273.4	20.4	19.1	5.9
EJESA	53219.0	187274.0	3643.0	2128.0	384.0	403.8	32.5	31.4	11.9
Energía Catamarca SAPEM	102602.0	94772.0	10261.0	4791.0	232.0	213.4	74.3	73.2	9.7
APELP	54657.0	2007.0	80.0	45.0	9.0	3.7	0.9	1.5	0.6
REFSA (datos 2013)	72000.0	97310.0	10731.0	6872.0	559.0	226.9	80.2	110.4	28.6
EDESTESA (datos 2017)	36668.0	36114.0	1644.0	596.0	154.0	98.1	18.0	16.9	2.4
Coop. Godoy Cruz	75.0	60143.0	1350.0	797.0	148.0	130.7	18.5	19.0	7.0
Coop. CALF (datos 2011)	128.3	66214.0	1432.0	575.0	61.0	147.2	9.9	6.1	1.5
Coop. Luján	777.0	39062.0	1922.0	1010.0	181.0	80.3	11.2	11.0	4.7
UPM Tandil SEM	300.0	54196.0	1371.0	512.0	67.0	93.0	10.2	7.3	2.2
Coop. Concordia	620.0	48677.0	1320.0	584.0	76.0	110.0	19.0	15.0	3.0
Coop. Bariloche (datos 2017)	340.4	41585.0	1278.0	821.0	154.0	85.0	11.7	14.5	7.0
Coop. Olavarría	7715.0	46069.0	330.0	160.0	38.0	68.2	2.6	2.3	0.8
Coop. Pergamino (datos 2017)	583.0	36304.0	137.0	70.0	21.0	82.0	2.0	2.0	2.0
Coop. Gualeguaychú	2900.0	35402.0	741.0	375.0	63.0	72.2	8.8	7.0	2.6
DPEC (datos 2006)	88199.0	s/d	s/d	s/d	s/d	s/d	s/d	s/d	s/d
DPE Ushuaia (datos 2014)	59.0	18055.0	1013.0	632.0	135.0	41.3	7.2	7.1	3.6
Coop. Chacabuco	2290.0	21050.0	65.0	34.0	10.0	34.5	1.3	0.6	0.0
Coop. San Pedro (datos 2010)	1322.0	18578.0	982.0	458.0	78.0	37.3	2.9	2.4	1.4
Coop. Salto (datos 2017)	1200.0	11201.0	150.0	32.0	0.0	23.9	2.3	1.4	0.0
Coop. Azul	6545.0	26476.0	339.0	157.0	14.0	40.8	2.6	1.6	0.4
Coop. Tres Arroyos (datos 2017)	4067.0	22919.0	246.0	135.0	29.0	4.4	5.1	17.1	14.5
Coop. Zárate (datos 2010)	1202.0	25609.0	1498.0	619.0	92.0	s/d	s/d	s/d	s/d
Coop. Saladillo	2736.0	12940.0	189.0	55.0	6.0	24.3	2.4	2.1	0.3
Coop. M. Moreno	2158.0	16950.0	110.0	59.0	8.0	27.9	2.1	1.7	0.4
Coop. Colón	874.0	9674.0	196.0	111.0	17.0	17.3	1.4	1.2	0.4
Coop. San Bernardo	6.8	20406.0	110.0	65.0	10.0	14.4	1.3	1.5	0.9

Source: ADEERA.

A4 Physical consumption by jurisdiction

Table A2: Physical consumption by jurisdiction. In MWh. 2018

PROVINCE	Residential < 10 kW	No Residential < 300kW	No Residential 300kW	Big Users WEM	Total
Buenos Aires	5,213,406	4,427,375	1,449,569	4,504,658	15,595,007
Cap. Fed. + GBA	26,756,393	12,094,297	4,544,231	7,161,964	50,556,886
Catamarca	590,957	317,630	122,187	203,751	1,234,526
Chaco	2,147,679	626,307	167,058	19,217	2,960,261
Chubut	615,584	561,139	259,366	208,013	1,644,102
Cordoba	4,177,593	3,501,723	1,615,164	617,589	9,912,069
Corrientes	1,666,582	819,715	220,612	165,957	2,872,866
Entre Rios	1,588,600	1,290,050	636,336	289,555	3,804,541
Formosa	954,326	295,519	30,966	24,316	1,305,125
Jujuy	543,771	374,419	51,734	128,472	1,098,396
La Pampa	395,757	368,502	108,422	12,317	884,998
La Rioja	675,702	609,264	65,165	143,154	1,493,285
Mendoza	2,017,382	2,021,482	344,556	1,275,545	5,658,965
Misiones	1,748,481	857,292	169,409	16,774	2,791,956
Neuquen	751,164	575,780	233,437	201,106	1,761,486
Rio Negro	807,834	758,861	148,120	221,602	1,936,416
Salta	1,055,918	874,127	82,025	81,279	2,093,349
San Juan	1,196,153	674,452	118,803	225,807	2,215,216
San Luis	609,896	399,972	227,774	401,703	1,639,345
Santa Cruz	306,772	326,456	19,083	457,860	1,110,171
Santa Fe	4,908,732	3,288,598	1,868,285	2,597,120	12,662,734
Sgo. Del Estero	1,118,603	446,493	68,616	55,174	1,688,886
Tucuman	1,614,536	837,914	257,141	355,227	3,064,818
Total Demand	61,461,819	36,347,369	12,808,058	19,368,159	129,985,405

Source: ADEERA.

A5 Social tariff beneficiaries

Table A3: Distribution of households with and without access to social tariff. By deciles and by jurisdiction

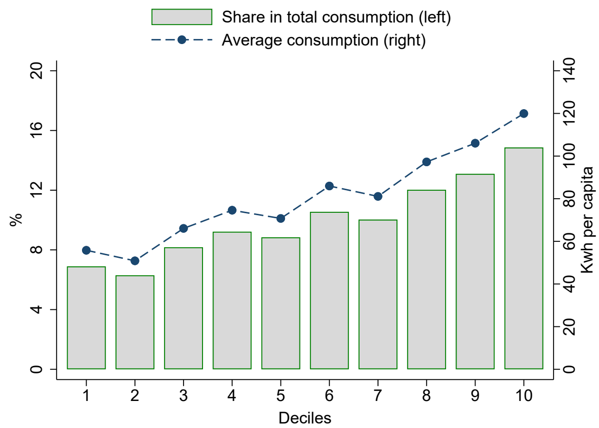
		Decil										
		1	2	3	4	5	6	7	8	9	10	Total
AMBA	Without Social Tariff	149,559	168,788	210,043	276,815	304,161	355,326	367,700	442,718	503,334	684,167	3,462,611
	With Social Tariff	186,120	169,728	157,625	137,408	147,424	141,405	115,951	107,949	106,796	62,313	1,332,719
	Total	335,679	338,516	367,668	414,223	451,585	496,731	483,651	550,667	610,130	746,480	4,795,330
	Share with Social Tariff (%)	55.45	50.14	42.87	33.17	32.65	28.47	23.97	19.60	17.50	8.35	27.79
Cordoba	Without Social Tariff	20,955	25,366	46,982	47,973	61,158	65,138	67,389	83,267	93,213	147,059	658,500
	With Social Tariff	52,493	47,336	42,980	46,308	45,536	41,417	39,309	32,174	43,136	16,750	407,439
	Total	73,448	72,702	89,962	94,281	106,694	106,555	106,698	115,441	136,349	163,809	1,065,939
	Share with Social Tariff (%)	71.47	65.11	47.78	49.12	42.68	38.87	36.84	27.87	31.64	10.23	38.22
Corrientes	Without Social Tariff	9,404	8,018	10,703	9,582	10,101	11,743	18,977	22,784	25,316	36,829	163,457
	With Social Tariff	7,836	11,988	6,956	11,109	11,438	10,999	6,441	5,929	7,211	5,617	85,524
	Total	17,240	20,006	17,659	20,691	21,539	22,742	25,418	28,713	32,527	42,446	248,981
	Share with Social Tariff (%)	45.45	59.92	39.39	53.69	53.10	48.36	25.34	20.65	22.17	13.23	34.35
Jujuy	Without Social Tariff	5,299	6,637	5,606	5,653	13,330	8,091	10,559	14,367	14,508	22,391	106,441
	With Social Tariff	7,275	7,118	6,954	6,733	3,755	6,583	8,487	4,888	6,648	4,717	63,158
	Total	12,574	13,755	12,560	12,386	17,085	14,674	19,046	19,255	21,156	27,108	169,599
	Share with Social Tariff (%)	57.86	51.75	55.37	54.36	21.98	44.86	44.56	25.39	31.42	17.40	37.24
Mendoza	Without Social Tariff	15,957	14,850	24,920	25,734	34,308	39,505	44,077	34,929	48,749	59,555	342,584
	With Social Tariff	15,653	17,652	18,263	14,281	9,473	12,441	8,209	16,896	12,332	8,401	133,601
	Total	31,610	32,502	43,183	40,015	43,781	51,946	52,286	51,825	61,081	67,956	476,185
	Share with Social Tariff (%)	49.52	54.31	42.29	35.69	21.64	23.95	15.70	32.60	20.19	12.36	28.06
Rio Negro	Without Social Tariff	4,587	5,303	8,392	7,891	11,122	15,538	15,673	21,556	26,573	34,797	151,432
	With Social Tariff	11,497	8,843	9,818	9,078	7,215	7,692	8,183	3,836	2,646	1,510	70,318
	Total	16,084	14,146	18,210	16,969	18,337	23,230	23,856	25,392	29,219	36,307	221,750
	Share with Social Tariff (%)	71.48	62.51	53.92	53.50	39.35	33.11	34.30	15.11	9.06	4.16	31.71
Santa Fe	Without Social Tariff	13,145	37,365	25,460	49,300	58,366	57,837	75,449	79,303	112,705	122,070	631,000
	With Social Tariff	49,060	43,831	52,913	51,166	44,901	40,423	40,427	42,949	23,031	28,905	417,606
	Total	62,205	81,196	78,373	100,466	103,267	98,260	115,876	122,252	135,736	150,975	1,048,606
	Share with Social Tariff (%)	78.87	53.98	67.51	50.93	43.48	41.14	34.89	35.13	16.97	19.15	39.82

Source: Own elaboration based on ENGHo 2017-18 and eligibility criterias for the Social Tariff. *Notes*: All values are weighted using the population expansion factor. Deciles of individuals ordered by per capita familiar income.

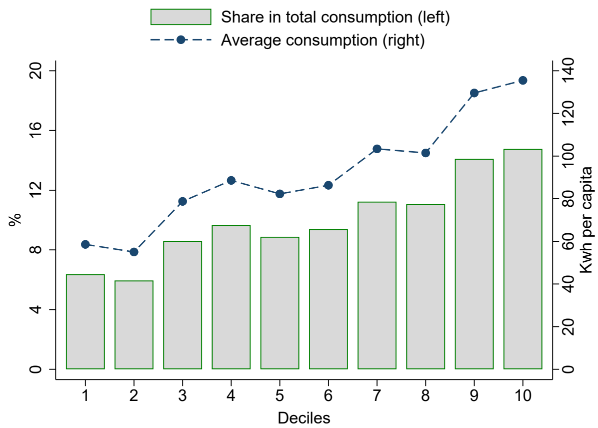
A6 Electricity consumption by deciles

Figure A10: Electricity consumption in Argentina. By deciles of per capita income. Level in Kwh per capita and share in the total consumption. Selected jurisdictions, 2018

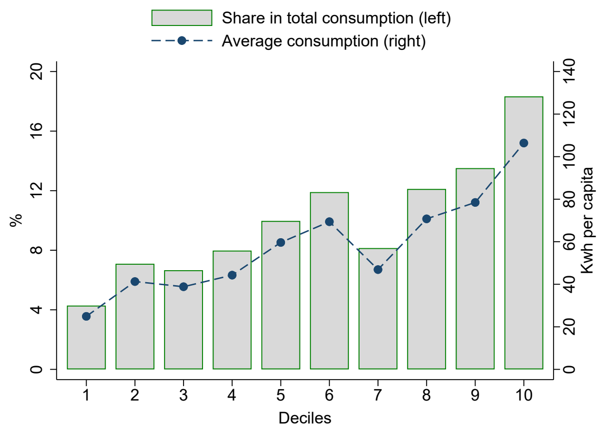
(a) AMBA



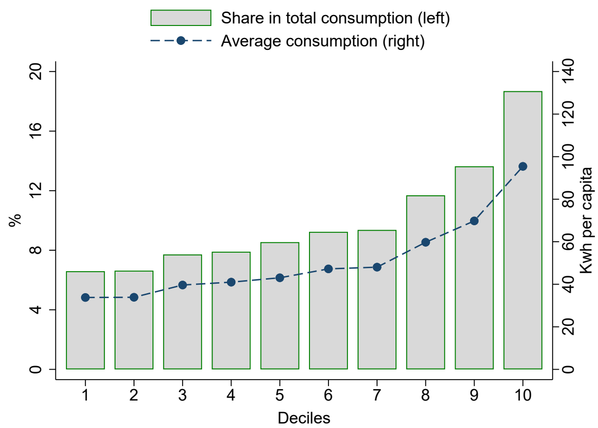
(b) Cordoba



(c) Corrientes



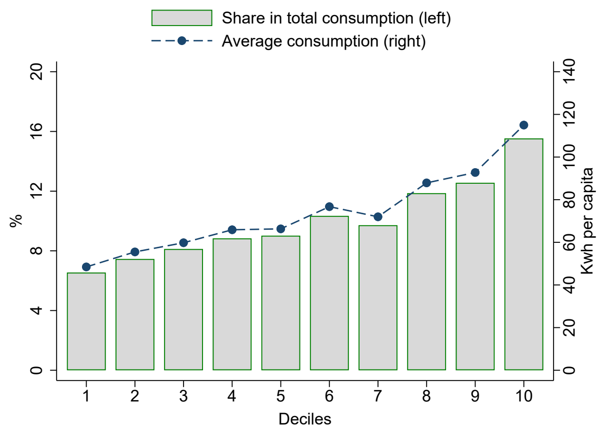
(d) Jujuy



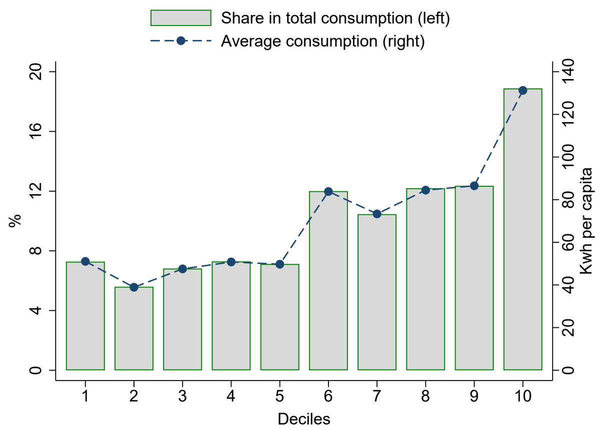
Source: Own elaboration based on ENGHo 2017-18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

Figure A10 (Cont.): Electricity consumption in Argentina. By deciles of per capita income. Level in Kwh per capita and share in the total consumption. Selected jurisdictions, 2018

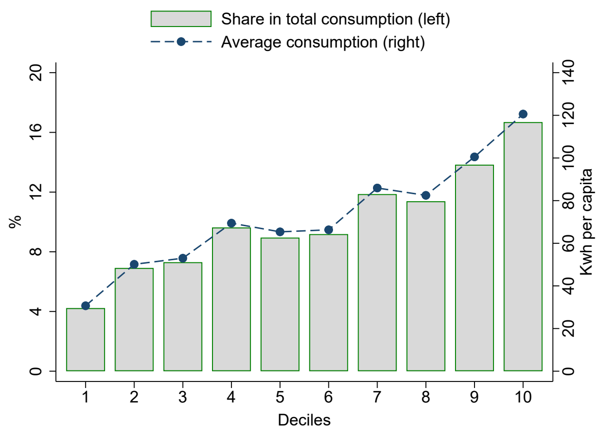
(e) Mendoza



(f) Rio Negro



(g) Santa Fe

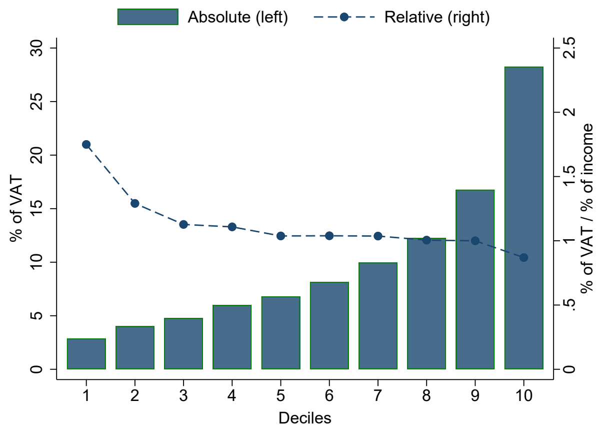


Source: Own elaboration based on ENGHo 2017-18 and specific information of the energy sector. *Notes*: All values are weighted using the population expansion factor.

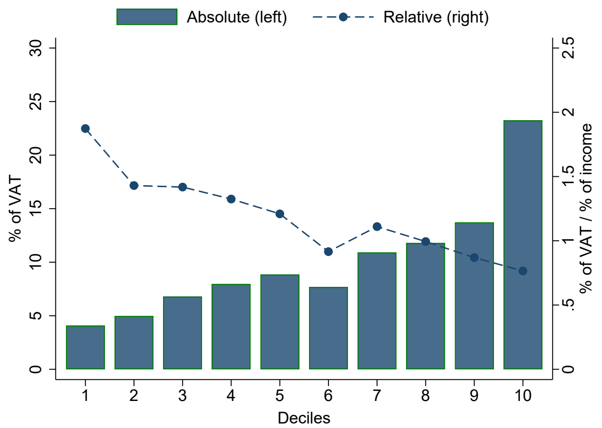
A7 Distributional incidence of VAT in Argentina

Figure A11: Distributional incidence of the VAT in Argentina. By deciles of per capita income. Selected jurisdictions, 2018. In absolute and relative terms

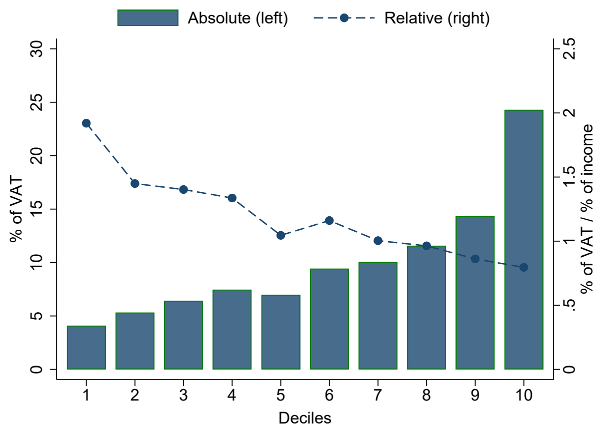
(a) AMBA



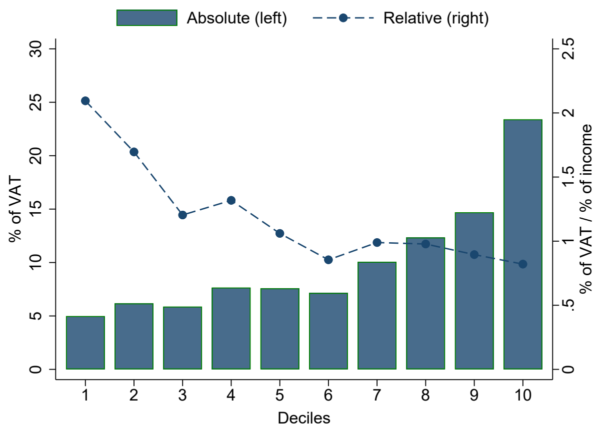
(b) Cordoba



(c) Corrientes



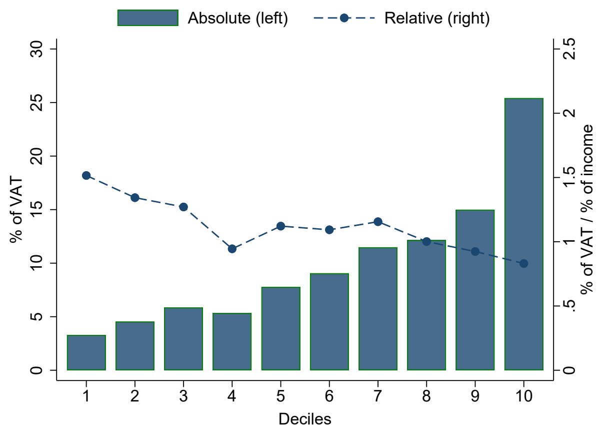
(d) Jujuy



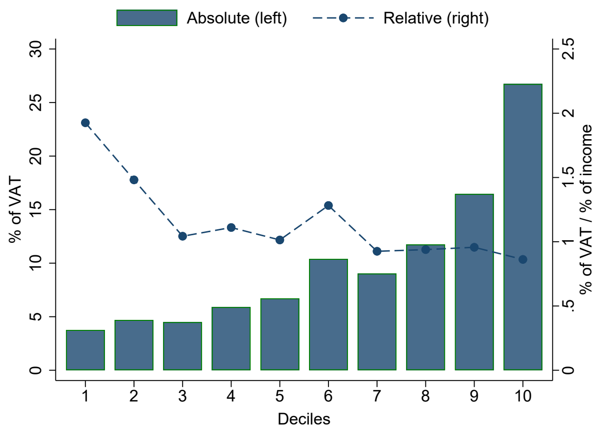
Source: Own elaboration based on ENGHo 2017-18 and Fernández Felices *et al.* (2016). *Notes*: All values are weighted using the population expansion factor.

Figure A11 (Cont.): Distributional incidence of the VAT in Argentina. By deciles of per capita income. Selected jurisdictions, 2018. In absolute and relative terms

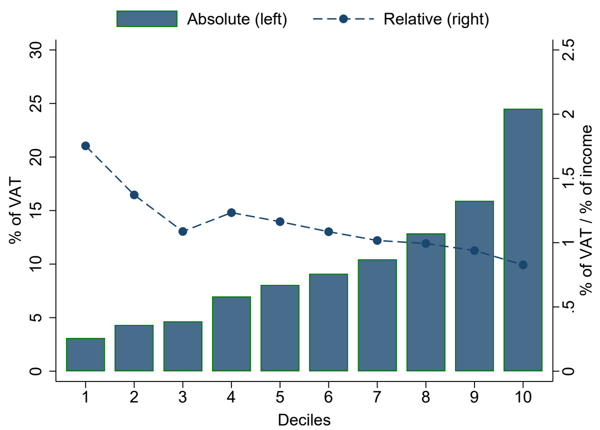
(e) Mendoza



(f) Rio Negro



(g) Santa Fe

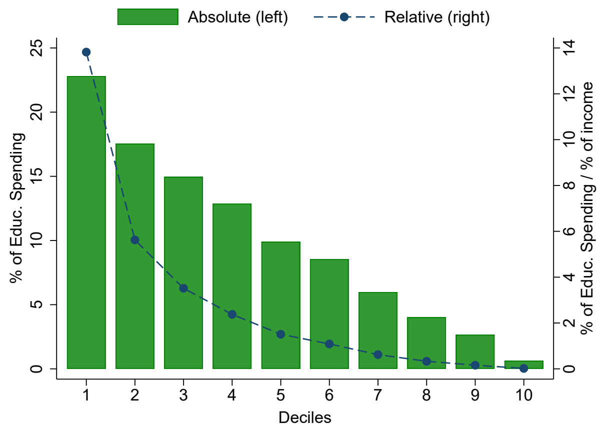


Source: Own elaboration based on ENGHo 2017-18 and Fernández Felices *et al.* (2016). *Notes*: All values are weighted using the population expansion factor.

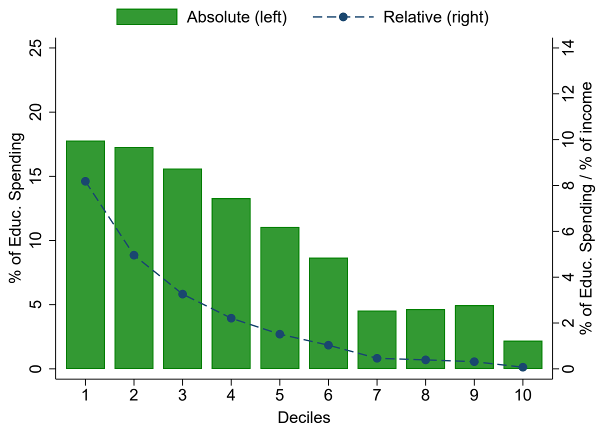
A8 Distributional incidence of spending on education in Argentina

Figure A12: Distributional incidence of the spending on education in Argentina. By deciles of per capita income. Selected jurisdictions, 2018. In absolute and relative terms

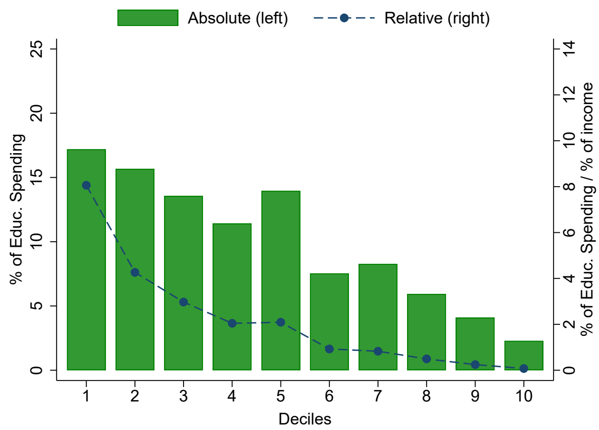
(a) AMBA



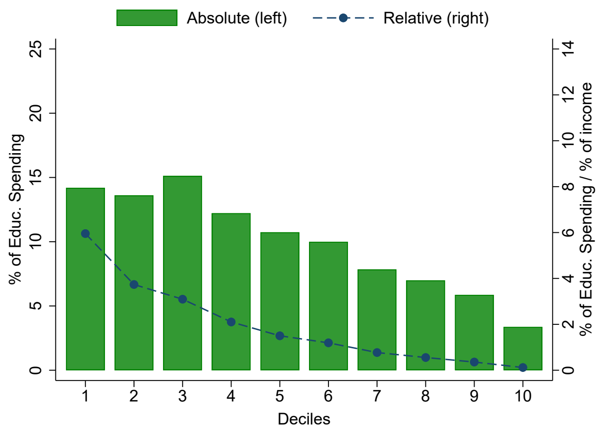
(b) Cordoba



(c) Corrientes



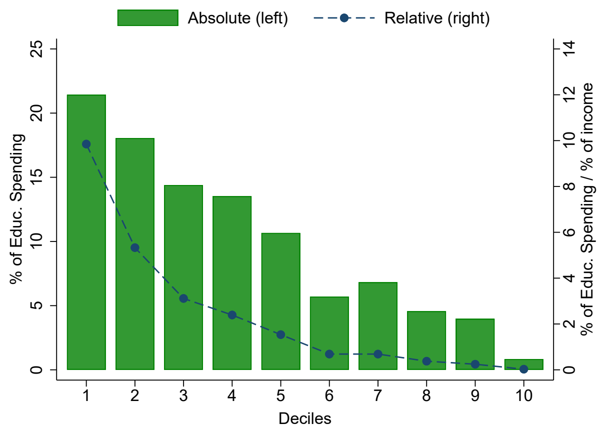
(d) Jujuy



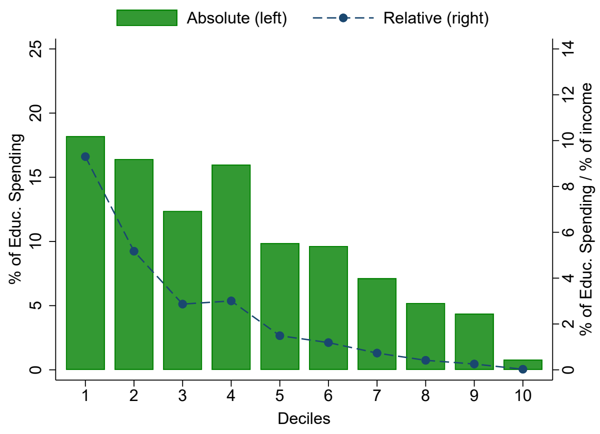
Source: Own elaboration based on ENGHo 2017-18 and Gasparini *et al.* (2014). *Notes*: All values are weighted using the population expansion factor.

Figure A12 (Cont.): Distributional incidence of the spending on education in Argentina. By deciles of per capita income. Selected jurisdictions, 2018. In absolute and relative terms

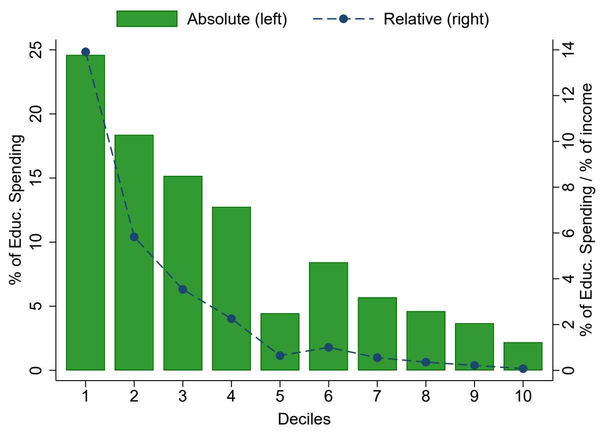
(e) Mendoza



(f) Rio Negro



(g) Santa Fe



Source: Own elaboration based on ENGHo 2017-18 and Gasparini *et al.* (2014). *Notes*: All values are weighted using the population expansion factor.