Electricity rate structure design in Latin America: Where do we stand? Where should we go?

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Overview

Electricity pricing is undergoing a fast transformation in line with the substantial structural changes embedded in the energy transition. Seen from a historical perspective that started in the post WWII period under different organizational forms, electricity pricing will be reformed to accommodate two fundamental shifts in the basic grammar of costs and prices. First, marginal prices will converge to very low values even with more time and space dependency or volatility. Second, fixed charges will emerge as much more important due to the more significant role of network costs in a decentralized system that incorporates diverse distributed energy resources. Those significant variations in generation and locational cum congestion costs move the trend towards time of use pricing schemes that now face much less frictions or transaction costs, due to the astonishing impact of digitalization. This gigantic shift puts a lot of pressure for reform of the *status quo* of electricity pricing, particularly in emerging economies like those of Latin America and the Caribbean (LAC), where the "pricing code" is still conceived in the old paradigm, extremely biased towards volumetric components without a correspondence with costs components, unrelated to time-varying differentiation and with an excess of discriminatory pricing embedded, in many countries, in an overuse of block pricing. In addition, LAC is trapped in a regime where affordability is perhaps a prime impediment for an efficient rebalancing towards fixed charges, resembling the old equity/efficiency debate on two-part tariffs.

Methods

Against this backdrop and given *status quo* in LAC (which is quite heterogenous in terms of regulatory institutions, pricing practices and affordability problems), our main purpose is to contribute to the shaping of an information and policy research agenda in the region. We do so by discussing principles and guidelines of tariff design from a methodological angle; separating conceptually tariff elements between variable and fixed components; providing a discussion of the correspondence of tariffs with cost categories; isolating tariffs from other components of end-user price signals such as taxes and charges; discussing elements of consumer type classification; contributing to the agenda of reform of pricing and tariff design in electricity and the options of trade-offs open to tariff reform and suggesting components of a dataset and information requirements for such an agenda. We relate to the from the extensive literature on optimal utility pricing. Borenstein and Bushnell (2021) and several supporting papers are closely related to our approach to cost reflectivity in electricity. We also relate to the evidence and debate on non-linear tariffs and average versus marginal signals response by consumers (Borenstein, 2009; Ito 2014; Ito and Zhang, 2020; Shaffer, 2020; Lavandeira *et al*, 2022) for its implications to evaluate excess differentiation of tariff blocks (something found in Navajas and Porto, 1990 and Borenstein, 2010 from distributional or welfare perspectives). On cost structure issues, we relate to ACER (2021) approach on electricity distribution, which is also useful on customer type classification. We also discuss pricing implications of cost structure envisaged in Borenstein (2016), Perez-Arriaga *et al* (2017) and Helm (2017). Faruqui and Tang (2021) provide an account of practices and trends in electricity tariff design which also maps into customer classification issues. We are linked to papers on LAC (McRae and Wollak, 2020; Hancevic, Nuñez and Rosellon, 2020 and Urbiztondo, Barril and Navajas, 2020) that have pointed out electricity tariff design problems that lead to excessive volumetric bias or tariff differentiation. We use preliminary results from Navajas and Olguin (2022) in terms of the informational efforts to evaluate tariff schedules across different jurisdictions. Evidence on carbon pricing metrics relevant for electricity tariff reform is taken from Ahumada, Espina-Mairal, Navajas and Rasteletti (2023,2024).

Results

Options for LAC look like an avenue for i) improving cost recovery through better wholesale market design and regulation; ii) move outside excess volumetric pricing and towards fixed charges and capacity charges; iii) reduce excessive block pricing; iv) promote metering and regulatory flexibility for menu pricing with optional schemes and guaranteed bills; v) promote flexibility for new customer clustering and pricing to accommodate innovation in the energy transition; vi) attend affordability through tariff schemes and transfers and move towards lump sum in social tariff schemes as a reform of (differentiated) fixed charges for low-income households; vii) introduce tax rebates for median income households; viii) reform taxation to coordinate among different jurisdictions.

Conclusions

One important aspect to bear in mind is that there is no dominant-model-fits-all strategy or "pret-a-porter" blueprint and countries are in different stages and paths insofar as treatment of the trilemma and the tradeoffs. There are different political economy equilibria insofar as tariff reform structures are concerned. There are nevertheless two main polar "models", depending on the role of tariff structures in coping with or responding to the affordability side of the trilemma. The first one is what may be termed a "s*ignal-efficiency model",* with main blocks being supported by *c*ompetitive wholesale market; incentive regulation 2.0; metering; two-part tariffs plus tariff packages and new tariff clusters; social marginal cost pricing; time of use; and, very importantly, lump sum fiscal subsidies to solve affordability. The second polar, rival one is what may be called a *"cross-subsidy model"*, with intervened wholesale markets; basic incentive regulation; block pricing; intra marginal price interventions; basic time of use tariffs; social tariffs or subsidies fundamentally embedded in pricing. The way in which countries will locate between these two polar forms will be very much dependent on their fiscal and distributional performance. Fiscal performance seems essential to this discussion because the signal efficiency model is based on the assumption that fiscal transfers are available to solve the affordability, cost recovery, cost reflectivity trilemma. It assumes that fiscal instruments are available so as to decouple efficient pricing from lump sum transfers that accommodate affordability. If these instruments are not available, and the NRA does not have mandate or capacity to mimic lump sum fiscal policy through differentiated fixed charges, then the bias towards the cross-subsidy increases.

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