WATER REFORMS IN SENEGAL: A REGIONAL AND INTERPERSONAL DISTRIBUTIONAL IMPACT ANALYSIS[1]

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Abstract

This paper focuses on the distribution of gains and losses from Senegal's water reforms across regions and across households according to their income classes. Within those groupings, we assess the differentiation of the impact between educated and non-educated consumers. The sector specific impact of the reform builds on a comparison of consumption patterns before and after the reforms. We show that most of the gains accrue to the highest income classes while the poor have seen no changes or suffered losses when looking at the extension of the water network. We then use a multi-household integrated Computable General Equilibrium model (CGE) to analyze the impact of possible water pricing reforms on poverty in Senegal. Accounting for the general equilibrium effect largely validates the basic statistical results. It also shows that the best educated classes within income groups and within regions tend to gain relatively more from the reforms. We conclude that the simulated price increases for the sector have marginal effects on government finances but positive effects on most actors except households unless specific transfer programs are introduced to protect the poor.

Keyword: computable general equilibrium model, micro-simulation, poverty analysis, income distribution, privatization.

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1. Introduction

There is currently a very emotional debate in the policy arena on the pros and cons of the privatization of utilities. Many African policymakers are looking into the very mediatic Latin American policy reversals and are starting to question their own privatization efforts.[5] Africa's experience is however still recent and up to now there has been little robust evidence of its impact on users.[6] Senegal is one of the few African countries with a track record long enough to allow a fair impact assessment because some of its reforms started in the mid 1990s.

Most of this literature on African utility reform experiences is however not analytical. Whether on Senegal or on other countries, it has so far focused on reform processes rather than outcomes or on partial impact assessments rather than full impact assessments, in particular with respect to poverty related issues.[7] This paper is, to our knowledge, the first attempt to investigate this impact analytically for a specific African case study with a focus on Senegal's water utility reform experience.

In this paper, we emphasize the distributional effects of reforms because they are among the main concerns voiced by the international community in assessing any type of reform associating the private sector to the delivery of public services. We focus on two main distributional dimensions.[8] The first is the effect across households. The second focuses on the

[5]For an overview of the issues in Latin America, see Estache (2005a)

[6] A look at the DFID, GTZ and AFD web site illustrates the popularity of Senegal experience. It is covered by the three agencies as part of its efforts to disseminate best practice in Africa.

[7] For a survey of what is known about reforms and their impact in Africa, se Estache (2005b).

[8] We actually started this research by also trying to compare the effects of reforms across economic agents (households vs. firms vs. government) and across sectors but the water specific reforms have a very modest impact at that level. The fact that sector specific reforms have such a modest macroeconomic effect is clearly an interesting result in itself but does not raise many interesting policy issues which is why we do not report the detailed results here. They are however available from the authors.

impact across regional, separating the country into three regions: Dakar, other urban centers and rural areas. Within each of these categorizations, we also distinguish between educated and uneducated users. This additional decomposition allows us to enrich the regional decomposition analysis as the levels of poverty are almost twice as high in the non educated groups compared to the educated groups in the three regions as will be shown in Table 6. Our main objectives is to analyze the distributional and poverty of water pricing reforms often associated to privatization of water utilities and perform an ex ante analysis of a targeted transfer program to compensate poor households affected by water price increases.

We rely on a macroeconomic framework to conduct our diagnostic because water utilities reforms can impact the poor through their effects in other markets as well (i.e. the labor, capital and products markets). An economy-wide analysis is thus needed to capture these secondary effects. Because the feedbacks are multidimensional, the analysis calls for a multi-agent, multi-commodity model. This is what computable general equilibrium models (CGE) deliver[9]. The latest generations of CGE models are indeed very useful to simulate the social impacts of reforms. This is allowed by the detailed modeling of the socioeconomic structure of any economy in a social accounting matrix (SAM). How deep the analysis goes depends on data availability. [10] The data on Senegal's water sector is relatively complete and allows an explicit modeling of this infrastructure, possibly the most detailed modeling available of the distributional implication of an infrastructure sector so far. [11]

[9] For a review of the history of CGE see Hertel and Reimer (2004).

[10] The potential of these models was quite clearly identified early on as seen in Dervis, de Melo and Robinson (1982)

[11] While there are about 25 years of CGE modeling experience, the published CGE literature on the distributional effects of public infrastructure service reform is indeed rather modest to begin with: Chisari et al (1999), Benitez et al. (2003) and Navajas (2000) for Argentina, Andersen and Faris (2002) for natural gas in Bolivia and Lofgren et al (1997) for rural Morocco are about the only published papers on the topic. They all address the distributional issues at a very aggregate level simply because household data quality was quite limited

In this paper, we rely on an integrated multi-household CGE (CGE-IMH).[12] The approach was first proposed by Decaluwé et *al.* (1999b).[13] It is theoretically sound since the macro and micro components are coherent and fully respect the standard CGE framework. It includes most or all households from the household survey into a CGE model. The version used here explicitly addresses criticisms to this method raised by Rutherford et *al.* (2005) and Chen and Ravallion (2004). They highlight the fact that data reconciliation between household data and the SAM data can be extremely difficult and as the approach requires balancing all accounts, data reconciliation is necessary at the household level. Given the good information available in Senegal, both issues could be addressed easily. Our first main assumption for data reconciliation is to adjust the aggregation of the family level data on consumption and expenditure to the level reported by National Accounts in the SAM. Next, we use the structure of income and expenditures observed in the micro surreys and apply these structures to the SAM, replacing the National Account based structure by the micro based structure.[14]

We rely on the database developed by Boccanfuso et *al.* (2005). We then modify their model to allow the integration of stylized facts necessary for the impact analysis of the water utilities. This implied an explicit modeling of the market structure of the sector. We also needed to identify a specific set of simulations reflecting the changes typically associated with water sector reforms. The most common change is a price increase to improve cost recovery. We

[12] This is one of the three main approaches used to link macro reforms to changes in income distribution and poverty. The other two are the representative household approach (RH) and the top-down or micro-simulation sequential approach (MMS). Because the RH approach consists of using representative household subgroups, it is problematic for our concern here because it does not account for the within-group redistribution of income and hence can lead to misleading conclusions as demonstrated in Savard (2005).The MMS approach has different variants: macro-accounting (Chen and Ravallion (2004)) or micro-behavioral (Bourguignon, et *al.* (2005)). This approach does not explicitly capture the feedback effects of the micro household behavior as stated in Hertel and Reimer (2004) as well as in Bourguignon and Spadaro (2005). The CGE-IMH approach is theoretically sound and allows capturing feedback effects.

[13] Some authors refer to this approach as a CGE micro-simulation application.

[14] After this procedure, minor adjustments were required on the initial SAM household account value to balance the SAM.

simulate the impact of efforts to increase the costs of recurrent and capital costs as well as several types of transfer policies aimed at mitigating the undesirable social outcomes of these efforts across income groups.

The paper is organized as follows. Section 2 summarizes the main water sector reforms in Senegal. Section 3 provides a very basic analysis comparing various performance indicators before and after the reforms to draw some initial intuitive conclusions on the impact on households of the reforms in the water sector. To do so, we rely on a simple comparative analysis of two survey periods using the Senegalese household survey ((Enquête Sénégalaise Auprès de Ménages), ESAM-I (94-95) and ESAM-II (00-01). Section 4 presents the specific general equilibrium model used here to account for all interactions between water and the rest of the economy. Section 5 provides a detailed poverty and regional incidence analysis due to the interactions accounted for in the model of improvement in cost recovery and in various ways to finance these improvements to minimize the impact on the poorest.. Section 6 studies the income distribution effects of the most likely financing options. Section 7 concludes.

2. Senegal's water reform experience

Senegal is an interesting case study because its utilities reforms are generally viewed as a success story by the international community.[15] The policy changes discussed for the utilities sector since the mid 1990s were relatively consistent with what was then considered best practice among experts. While the changes included many sectors and institutional dimensions, this paper focuses only on the long term effects of the reforms implemented in the operation and

[15] It was clearly so in water and telecoms, less so in energy because of the exit of the private operator of the sector. This exit has however not resulted in a major failure in the sector and the public Senegalese management has continued to run the sector without any significant problems.

management of the water utilities in 1996 and a series of policy fine-tuning implemented since, including a new price structure adopted in 2003.

The 1996 reforms aimed to secure the financial situation and the renewal of investments in the sector. One of its main elements was the partial privatization of the sector. The overall goal was to supply all households in Dakar with potable water by 2010. The government also aimed to increase private participation in the irrigation in rural areas. The commitment to these reforms was quite strong since they were actually included in the poverty reduction strategy paper (PRSP) approved by the board of the International Monetary Fund (IMF) and the World Bank (WB) in 2002.

The C*ompagnie des Eaux* was Senegal's private water utility company after independence. It was nationalized in 1972. Important investment followed but poor maintenance strategy lead to a quick depreciation of the infrastructure. *Société Nationale d'Exploitation des Eaux du Sénégal* (SONEES), a public company, was responsible for maintenance and improvement of the water supply in cities and the government was responsible for determining tariff changes twice a year. The financial situation of SONEES continually deteriorated due to poor revenues from their low tariffs, public companies and the government not paying their water bills and regular interference with the company's management. This situation prevented SONEES from expending its water supply outside of urban centers.

Three main reasons were used to justify privatization: (1) it would improve the financial situation with increased productivity; (2) it would improve efficiency in cost recovery; and (3) it would isolate the utility from government intervention. *Sénégalaise des Eaux* (SDE) was created with the participation of *Société d'Aménagement Urbaine et Rurale* (SAUR) as the main shareholder. SDE is responsible for the production and the distribution of water in urban and

peri-urban zones, the maintenance of the water network, commercial publicity and tariffs collection. SONEES continues to exist as a state holding and its role is essentially to manage the investment on potable infrastructures and also to delegate the renting and granting of permits (Bayliss (2001)).

The investments planned in that context aimed to increase access to potable water in the urban and rural areas.[16] Improvements in the provision of potable water for the rural population and mobilizing water for agricultural purposes were and still are priorities for primary sector investments. More specifically, the existing water supply networks are expected to eventually become consolidated and increased. The production capacity, transportation, stocking and distribution of water in urban centers have in fact all increased since the reforms. Investments are also expected to be associated with an institutional framework that guarantees a quality water service at minimal costs while implementing necessary reforms and improving exploration for new water sources for rural populations. For instance, the 2003 investment plan (MEF-2003) mentions that by 2010, the level of access to water should be raised to 35 liters per person per day to comply with the World Health Organization recommendations.

As part of the implementation strategy to achieve these goals, Senegal has seen a steady increase in the level of private sector participation since 2000 (MEF (2002)). Water pricing has improved as well. The price per cubic meter has increased on average by 3.1% annually. The water sector now makes the most of a flexible pricing system adjusted to the type of consumer. The new price structure adopted in early 2003 is based on several principles. First, the structure reduced the types of users to three categories: crop agriculture, households and other consumers. Those in the "other consumers" category face a fixed single tariff. The previous three-level tariff

[16] The government investments represent 11% of the total public investments for primary sectors and 25% of tertiary sectors (MEF (2000) and MEF (2001)).

system was maintained for households with a reduction of the volume considered for the lower tier from 100 to 40 m^3/bimester. There is a value added tax (VAT) exemption for the "social segment" including fire hydrant and crop agriculture usage.

The price of water is now comprised of the following elements: the 18% VAT; a specific tax distributed to *Fonds National de l'Hydraulique* (FNH); the asset price (*prix Patrimoine*) designed to cover operating costs (OPEX) and investment costs (CAPEX) of SONEES; debt servicing used to finance infrastructure and the investment fund to maintain and expand the network; the operator price designed to cover the operating costs of the private supplier SDE (OPEX); debt reimbursement and investments; operating material and contractual obligations for renewing the network. The OPEX and CAPEX are thus essential dimensions of the pricing structure as they are in most other countries which is why they will be central to the simulations to be reported later in the paper.[17]

3. Basic statistical analysis of the reform effects

Before discussing the insights allowed by the CGE modeling, it seems useful to get an intuitive reading of the distributional effects of reform from a very basic data analysis. To do so, we first look at the poverty context in Senegal to provide some sense of the evolution of various water specific market characteristics.

According to Cissé (2003), poverty headcount ratio in Senegal has expended significantly from the early 1980s to the mid 1990s. Nonetheless, poverty now seems to be declining. Poverty has dropped since the first household survey was conducted for 94-95 (Enquête Sénégalaise Auprès de Ménages I or ESAM-I). The headcount ratio has dropped from 58% to around 51%

[17] They will be central to the discussion later in the paper because they constitute the parts of the pricing structure most relevant to equivalent water reforms in other countries.

for households and 65% to 59% for individuals from the second survey conducted in 2000-2001, ESAM-II.[18] One of the major characteristics of poverty in Senegal is that it is heavily biased toward rural communities where more the 80% of the poor households are located. Historically, investment favoured cities and only a few rural cities where we find a lower poverty headcount ratio today (Cissé, 2003). In the 1970s, policies favoured wage earners over agricultural workers. Finally, the exchange rate policies and protection of industries in the 1980s produced an over-valued CFA franc favouring again the urban dwellers. Devaluation of the CFA franc in early January 1994 has corrected part of this bias, has allowed the economy some breathing room to grow and has generated significant decreases in the poverty level since then.

Table 1 presents an alternative snapshot of the poverty in terms of the characteristics of the water sector market structure. It shows the evolution between the two ESAM surveys of a decomposition of provider types (formal private vs. public and neighbourhood taps vs. other—mostly informal) according to two characteristics which address the main distributional dimensions, regional access rates vs. household access rates[19]. To provide a visual sense of these dimensions, the table decomposes the households based on three main regional groupings of *regions* (Dakar, Other urban and Rural) and of *income quintiles*[20].

[18] Conveniently or this paper, the first one was conducted just before the 1996 water reforms and provides a snapshot of the situation in 1994-95. The second provides an equivalent picture for 2000-01, 4-5 years after the initial policy change.

[19] In the first two categories, the water is supplied by SDE. In the case of private tapes, it concerns households with a link to the SDE water network. In the case of communal or public taps, it is linked to the SDE network and a person is designated to sell the water from this tap at a price different then the one charged by SDE. The margin charged for the public and communal taps can be quit high. For a more detailed description of the water market and prices see Diagne, Briand and Cabral (2004). In private tap, we included house tap and concession tap. In public tap, we included neighbour, public tap. In "other sources"; we include water vendor, cistern truck, concession well, village well surface water, and other sources.

[20] When aggregating the figures from this table, we obtain that 83% of the total urban households (Dakar plus other urban) are supplied by SDE water and the official government figures is 81% for 2002. Moreover, it is important to note that the quintiles are based on the three regions analysed and that the decomposition was based on family expenditure per capita.

The most obvious observation emerging from the table may be the regional differences in the changes associated with the reforms. The story is indeed very different between rural and urban areas and within urban areas. The story is also different between Dakar and other urban centers.

Table 1 : Decomposition of the distribution of supply source for water

	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile 5	
	1995	2001/02	1995	2001/02	1995	2001/02	1995	2001/02	1995	2001/02
Rural										
Private	1.4%	4.8%	5.4%	7.2%	8.8%	9.7%	7.3%	12.7%	11.4%	8.9%
Public & neighbour	19.1%	20.9%	29.0%	29.6%	28.5%	34.5%	46.3%	26.9%	31.8%	24.1%
Other sources	79.5%	74.4%	65.6%	63.2%	62.7%	55.8%	46.3%	60.3%	56.8%	67.0%
Other urban										
Private	27.1%	19.2%	12.3%	35.4%	42.7%	48.9%	42.5%	62.7%	72.8%	71.9%
Public & neighbour	44.3%	35.4%	58.1%	29.9%	33.5%	26.1%	33.3%	23.0%	16.2%	16.4%
Other sources	28.6%	45.4%	29.7%	34.6%	23.8%	25.0%	24.1%	14.2%	11.0%	11.8%
Dakar										
Private	44.0%	37.4%	41.0%	48.2%	43.6%	62.6%	45.4%	70.6%	82.0%	85.7%
Public & neighbour	56.0%	36.9%	46.2%	40.4%	46.4%	29.7%	45.9%	24.6%	14.8%	12.3%
Other sources	0.0%	25.7%	12.8%	11.3%	10.1%	7.7%	8.8%	4.8%	3.2%	2.0%

Sources: ESAM I and II

In rural areas, the share of the formal sources has increased for all income groups except the richest. Moreover, in rural areas, the share of private provision has also increased for all but the richest. Overall, the less formal sources continue to prevail across rural income groups.

In Dakar, the main observation may be the significant increase in the share of informal provision for the poorest and the declining trend of the informal across all other income groups. The share of private tap provision has increased for all but the poorest for whom the informal provision has also increased dramatically. This results is likely the result that the composition of the urban poor have changed in the period with the rural urban migration in addition to the fact that the households surveyed are not the same for the two rounds of the ESAM.

In other urban centers, the story is somewhat similar except on the relative importance of the private sector. Informal sources have increased significantly for the bottom 40% of the population while private and public provision has dropped significantly for the 20% poorest. Private provision has increased significantly however in these secondary cities and has in fact become the dominant source for the richest 80% of the population.

Overall, private providers have now essentially become the main source for Dakar and other urban centers but informal providers continue to the main ones in rural areas. Considering that informal providers tend to be more expensive and less reliable than private and often public providers, the bottom 20% of the population, across regions appears to be worse off with the evolution of the market structure. Considering the full set of information provided by Table 1, it is quite surprising to note that the formal supply to poor households does not seem to be one of the outcomes of the reforms so far. The upper middle class (third and fourth quintiles) may be have benefited the most from the reform. The fourth quintile enjoyed indeed important increases in the share of private tap installation in all regions. At the other extreme, the strongest decreases in private tap supply took place for the first quintile in Dakar and in Other Urban Centers.

In Table 2, we present the evolution in the water expenditure share in total expenditure for the same household decomposition as in Table 1 to get a sense of any significant change that could be observed between formal private operators and others. From a regional distributional angle, the most obvious observation stemming from a superficial look at Table 2 may be that households in the rural and "other urban" areas supplied by private taps generally saw their water share expenditure drop and for Dakar the households with private taps saw it increase. Unfortunately, given that the ESAMs provide the expenditure on goods, this evolution in the share of water consumption can be attributed to either a price change or a change in volume of

water consumed or a combination of both. It is however interesting to note the difference in outcome between Dakar and the other regions.

From the viewpoint of the comparison across income groups, the main story may be that for all households in the four lowest quintiles supplied by public or neighbourhood taps, the share of water consumption decreased. For the richest quintile (Quintile 5), this share increased. Once more, however, the welfare effect of this change is unclear since it reflects a combination of price and quantity effects. For households being supplied by "Other sources" in rural and secondary cities, the share has increased by quite a large proportion. In fact, considering Senegal as a whole, only 4 quintiles out of 15 supplied by "Other sources" saw a drop in the share of their expenditures on water. For 8 groups in this category, the water expenditure share more than doubled between the two periods.

Table 2 : Evolution of share of water expenditure in total expenditure from 1995-2000

	Quintile 1	**Quintile 2**	**Quintile 3**	**Quintile 4**	**Quintile 5**
Rural					
Private	1.0%	-28.5%	12.8%	-4.1%	-76.5%
Public& neighbour	-20.6%	-17.6%	-39.0%	-28.2%	84.6%
Other sources	52.9%	249.3%	-62.5%	-57.6%	531.2%
Other urban					
Private	-19.0%	5.3%	-3.7%	-18.5%	-8.1%
Public& neighbour	-43.3%	-12.1%	-24.2%	-30.5%	23.9%
Other sources	152.2%	2427.8%	290.8%	229.3%	133.0%
Dakar					
Private	12.6%	10.2%	6.6%	3.6%	10.9%
Public& neighbour	-15.9%	-17.0%	-36.0%	-31.0%	31.5%
Other sources	n-a	-10.3%	45.4%	103.3%	-34.9%

Sources: ESAM I and II.

Overall, the frequent drop in the share for the households supplied by private, public and neighbour taps combined with the frequent increase for household relying on "Other sources" hints at a possible problem with the overall strategy of accounting for the needs of the poorest as a result of the reforms since the poor tend to be mostly supplied from these alternative sources.

The only positive interpretation of this fact would be that most of the increase reflects a quantity effect rather than a price effect. This is unlikely and given the size of the changes, price increases is responsible for most of this change in the expenditure share. The data, however, does not allow a clearer diagnostic.

While this somewhat naïve preliminary diagnostic provides useful information, it needs to be further moderated by some technical dimensions of the survey supporting the diagnostic. First, that the household survey was performed on a different sample of households. This could explain at least some of the changes observed. Second, it does really do full justice to the fact that the public and neighbour supply comes in a large part from an extension of the water supply network which is one of the outcomes of the overall reform, including the increased participation of the private sector. The general equilibrium analysis presented next offers a more robust story by allowing a wide range of simulations on the impact of changes in water pricing and financing options.

4. A CGE to assess of the impact of water utilities reforms

The model used here to document the impact of water sector reforms in Senegal is an adaptation of the Boccanfuso et *al.* (2005) model used to assess the reforms of the groundnut sector in Sénégal. In order to capture the impact of policies on individual household welfare, we integrate specificities of the water utility sector with the specificities of the Senegalese economy. To do so, we isolate water production and then disaggregate the data into water produced by the utility company and water produced by informal suppliers. The rest of this section provides detailed presentation of the model used here.

Production is determined through a 3-level system. Total production of a sector (*XS*) is made up of fixed shares (Leontief) between value-added (*VA*) and intermediate consumptions (*CI*). *VA* is a combination of composite labor (*LD*) and capital (*KD*) related with a Cobb-Douglas function. Producers minimize their cost of producing VA subject to the Cobb-Douglas function. Optimal labor demand equations are derived from this process. Labor is then decomposed into qualified labor and unqualified labor, and the choice of combining these two factors is determined by the constant elasticity of the substitution (CES) function. This assumption allows for sector specific elasticity of substitution. We have assumed that capital is not mobile between sectors as it is difficult in the short to medium term to convert capital for use in another sector.

The water market structure is modeled explicitly in terms of the type of suppliers and of their pricing models. Consistent with the reality faced by the utilities, we assume that water utilities are subject to price controls (i.e. exogenous to the model which is roughly consistent with the ways the average tariff and the tariff structure are set in Senegal). This implies that the network will produce their goods based on the constraint of a production function and the quantity of water supplied will respond to the demand.[21] The output of the sector is therefore demand driven given the fixed price on the market. Since capital is fixed, these sectors will need to hire out labor and increase intermediate consumption to respond to an increase in demand or lay off workers and reduce intermediate consumption when faced with decreases in demand. In the model, the production sectors consume utility water and households can consume from any of the sources, according to the information found in the household survey. All water consumed within the categories of private tap and public and neighbor tap are supplied by the utility company. Water purchased from the third group (of our Table 1 and Table 2) is supplied by

[21] We make the implicit assumption that the water network will not be expanded endogenously and therefore the increase in demand originates for the consumers and industries already supplied by SDE"

private, informal water producers. The private water producers are an important consumer of water produced by the utility company but they have the option to substitute the two sources of water as their input for producing water.

Senegal is a small open economy, which implies that world prices of imports and exports are exogenous with infinite demand for exports by the rest of the world. We posit the Armington (1969) hypothesis for import demand where domestic consumers can substitute domestically produced goods with imports (imperfectly) with a sector specific elasticity of substitution. The relative price of the two goods is the other determinant of the ratio of imported goods versus demand for local goods. On the export side, the producers can sell the goods on the local market or export their production and are influenced by relative prices in each market and by their elasticity of transformation of the goods for one or the other market.

On the household side, we include in the model all 3,278 households of the Senegalese Households Survey (ESAM-I, 94-95) to capture intra group changes in the distribution of income. We do not need to specify any household groups in the model as we use a large number of households. With this approach, we circumvent one of the criticisms formulated by de Maio et *al.* (1999) on household disaggregation in CGE modeling. Our household income equations are consistent with the structure observed in the ESAM. The initial factor endowments (labor and capital and the endogenous transfers between agents are very important determinants for household welfare changes following policy simulations. In this model, factor allocations are exogenous and factor payments are endogenous.

As capital is fixed by sector, we have eighteen capital payments and two wages (qualified and unqualified). Dividends paid to households are also endogenous and are dependent on a firm's income after taxes. Inter-agent transfers are considered endogenous. The households that

are heavily dependent on these transfers turn out to be very vulnerable to differences in this variable. The other sources of income are exogenous transfers from the other agents (Government, and the rest of the world).

The private firm's income is the residual of capital income not paid to households to which must be added government subsidies and transfers from the rest of the world. We have also isolated the water and other utilities from the aggregate firm.

Government revenue is made up of production taxes, import duties, household and private firm income taxes, as well as transfers from the rest of the world (foreign aid). The Government spends its budget on producing public services, transfers to households, subsidies to private firms and transfers to the rest of the world.

The demand function for each household is derived from a utility maximization process (Cobb-Douglas utility function) which leads to demand functions with fixed value share for each good. Households have specific marginal share parameters based on observed data in the household survey. Investment demand is also specified with a fixed value share function. We use the GDP deflator as a price index, and as we have stated earlier herein, world prices (for imports and exports) are exogenous. Accordingly, the country has no control over world prices. The only specific item in terms of prices, as was previously mentioned, is that fact that prices of utilities are exogenous to reflect the observed stylized facts.

Model equilibrium conditions are also standard for non utility markets. The commodity market is balanced by an adjustment of the market price of each commodity. The labor market is perfectly segmented into qualified workers and unqualified workers and each market balances out with an adjustment of its specific nominal wage. It is therefore possible for workers to go from one branch to the other but not from one market to another. One should also note that labor

supply on each market is exogenous and that there is no endogenous unemployment.[22] The current account balance and the nominal exchange rate are fixed and hence the price index varies to allow the real exchange rate to clear the current account balance. The nominal exchange rate plays the role of the numéraire. For the savings to investment equilibrium, total investment is determined by to the sum of the agents' saving.[23]

The diagnostic of poverty and inequality changes is based on two commonly used indices in the context of macro-micro modeling. The poverty index chosen is the additively decomposable Foster, Greer and Thorbecke (FGT, 1984) P_α and for inequality analysis we selected the Gini index. [24] We use the change in households' welfare measured by the equivalent variation to measure the impact of the policy on each household. This approach has the advantage of taking into account the price and income effect simultaneously. This approach is quite standard in the context of macro-micro CGE analysis. The CGE-MSS model generates post simulation changes in welfare which are used for poverty and inequality analysis. Target groups are defined independently of the CGE modeling exercise and poverty and inequality analysis can be performed for the base period and after simulations.[25]

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[22] This does not mean that we assume that there is zero unemployment in the Senegalese economy but simply that unemployment is exogenous to the model.

[23] We have simulated the policies with other macroeconomic closures and the general trends of results are maintained even if we observe some slight changes in results. Complete set of equations, variables and parameters can be supplied upon request to authors.

[24] FGT poverty indexes are interesting within the framework of this analysis and make it possible to measure the proportion of the poor among the population but also of this poverty depth and severity. P_α indexes are calculated with the following equation:

$$P_\alpha = \frac{1}{\sum_{i=1}^{N} w_i} \sum_{i=1}^{q} w_i \left(\frac{z - y_i}{z} \right)^\alpha$$

where α is a parameter characterizing the degree of poverty aversion; z, the poverty line; y_i, household income; N, the total number of households; w_i, the sampling weight for the household i and q, the number of poor households, in other words, below the poverty line. Generally, the higher α is the greater, the importance granted to the poorest. ([24]) For detailed information on this index family, read Ravallion (1994).

[25]No groups are found in the CGE model but all households of the survey.

5. Who should care about pricing and transfer reform?

Section 3 showed how difficult it is to separate the quantity and the price effects of reforms from a simple comparison of basic statistical information. This section allows a refinement of the basic analysis by a documentation of the general equilibrium effect of water pricing and financing options. Indeed, one of the main concerns associated with water reform in Senegal as in most other developing countries is the social impact of pricing and financing reforms aimed at improving cost recovery.

Since specific information on the pricing policies of the operators, including the private operators, is not available, we present here illustrative simulations of the possible impact of various pricing strategies. We focus on strategies typically considered by private operators in their efforts to improve cost recovery. We analyze two broad types of policies. First, we focus on cost recovery only and compare the impact of an increase in the recovery of operating expenditures (OPEX) with the impact of an increase in the recovery of capital expenditures (CAPEX). For illustrative purposes, for OPEX we simulate an increase of 25% and for CAPEX an increase of 35%.[26] The common wisdom is that the resulting increases in water tariff will have a negative consequence on the welfare of poor households consuming SDE water but the

[26] As we are mainly interested in the impact of relative changes on various variables in the model, the exact level of the price changes is not key in our exercise. Simulating larger nominal levels would not have modified our comparative analysis but the amplitude of the effects. We have made some sensitivity analysis for this and our results are quite robust to this. The difference in the simulation of the OPEX and CAPEX reflect the cost structure of the sector which is presented in the appendix. This CAPEX represent approximately 23% of the total cost structure. We simulated the CAPEX as being just over 25% to have a round figure we used 25% for OPEX and 10% additional for the CAPEX.

specific average and distributional impact is unclear, although many of the critics of these policies argue that the poor are likely to suffer relatively more.

The second type of policy simulation we conduct is the introduction of a transfer program for poor households directly affected by the cost recovery programs. The level of the transfer is household specific and implies that the operator is allowed to rely on cross subsidies to meet the needs of the poor. We also run a set of simulations comparing cross-subsidies to various types of tax instruments and to foreign grants as sources of financing for the transfer programs needed to mitigate the consequences of a policy aiming at improving cost recovery. More specifically, we test: (i) an increase in household income tax level, (ii) an increase in private firms' income tax, (iii) an increase in import duties and finally, (iv) we look at a program were the transfers would be funded by an external donor. Even though the differences in impact of the various financing instruments proved to be relatively minor, we report all the results. For reference, the seven simulations are summarized in Table 3.

Table 3: Definition of simulations

Costs to be recovered better	Simulation code	Definition
OPEX	Sim 1	20% Increase in the price of SDE Water
OPEX	Sim 2	Sim 1 + transfers program to poor households supplied by SDE
CAPEX	Sim 3	35% Increase in the price of SDE Water + transfers program to poor households supplied by SDE
CAPEX	Sim 4	Sim 3 + Household Income tax to fund the transfers program
CAPEX	Sim 5	Sim 3 + Firms' Income tax to fund the transfers program
CAPEX	Sim 6	Sim 3 + Increase in import duties to fund the transfers program
CAPEX	Sim 7	Sim 3 + Foreign Aid to fund the transfers program

Before moving to the poverty and inequality analysis, let us mention that we do not analysis the general equilibrium effects of the reform as this is not the focus of the paper. However, it is important to highlight that the various policies simulated had an effect on changing market prices and factor payments. Both wages decreased in all scenarios analyzed

with the strongest decrease found for simulation 3 with a reduction of 1.25% for the formal wage. The rental rates of capital excluding the water sector varied from an increase of 0.8% for edible oil industries in simulation 3 to a decrease of 2.5% for electricity sector for simulation 7. All other variations were between these values. The market prices were the least sensitive to the simulated policies when excluding the two water sectors. Prices changes were in the range of -0.94% for the private services for simulation 3 to +0.44% for the other industries in simulation 7. It is therefore through these variations that the households will be affected and the CGE model used here allows us to capture the price effect on water and other goods as well as income effect on factor payments. A partial equilibrium analysis would have excluded these effects[27].

We are now ready to move to the poverty and inequality analysis under the different policy scenarios. Because we are interested in isolating the impact of the introduction of private operations of the network, we first separate the households based on their source of supply (SDE vs other). Next we separate the users according to their location: Dakar, Other Urban and Rural. Finally, we also try to test for the relevance of the education level and within each region, we separate households in which the head is educated from those in which the head is not educated. The definition and relative importance of the groups are presented in Table 4.

Table 4: Decomposition of groups and some statistics

Decomposition	Code	Definition	%
Regional /educational	DKRE	Dakar-educated	16,12
	DKRNE	Dakar-non-educated	17,27
	AUE	other urban educated	9,11
	AUNE	other urban non educated	17,33
	RE	Rural educated	3,61
	RNE	Rural non educated	36,56
Water supply	NSW	Not supplied by SDE	47,23
	SW	Supplied by SDE	52,77

Sources: ESAM I and II.

[27] Complete table of key variables of the CGE model can be provided upon request to the authors.

To get an average benchmark, we first look at the changes in poverty indices at the national level before moving to the regional decomposition analysis. We report three measures of poverty, incidence, depth and severity. Incidence is the most common definition used. It reports the share of poor in the total population. For the base case,, FGT0=0.58 indicates that 58% of the population is poor. This corresponds to the official statistic reported by Senegal for the base year. Poverty depth, FGT1, reflects the difference between the poor's income and the poverty "floor" It is simply a more refined measure of poverty than the simple proportion of poor in the total population measured by FGT0. Poverty severity, FGT2, is the square of the poverty depth figure. This measure boils down to an stronger weight for the very poor. Table 5 summarizes the results.

Table 5: Variation of poverty indices at the national level

National								
	Base	**Sim 1**	**Sim 2**	**Sim 3**	**Sim 4**	**Sim 5**	**Sim 6**	**Sim 7**
FGT 0 (Incidence)	0.58	0.31	-0.19	-0.51	-0.35	-0.43	-0.43	-0.43
FGT 1 (Depth)	0.27	0.21	-0.54	-0.92	-0.90	-0.93	-0.95	-0.95
FGT 2 (Severity)	0.15	0.30	-0.64	-1.09	-0.98	-1.06	-1.10	-1.10

Source: from authors' computation

As expected, a policy aimed at increasing cost recovery in the water sector without any adjustment in transfers to protect the poor will result in a deterioration in the three poverty measure. The first simulation (an increase in OPEX cost recovery without transfers) shows indeed an increase of .31% in the poverty rate, of 0.21% in poverty depths and of 0.30% in poverty severity.[28] The effect on poverty is quite small considering the importance of the price increase. This is explained in large part by the relatively small number of poor households relying on SDE water.

[28] It is important to highlight that the poverty changes at the national level were computed with the entire set of households included in the model.

The second simulation consisted of giving a cash transfer to poor households consuming SDE water. Even if this number is relatively small, the transfer produces a positive effect at the national level with a reduction of the headcount index of 0.19%, this is even more positive for the depth and severity index as they decrease respectively by 0.54% and 0.64%. This shows that the households negatively affected in the first simulation were the poor households consuming SDE water.

Simulation 3, which is the same simulation 2 but with a stronger price increase, suggests that the transfer policy financed by the operator has an even stronger poverty reduction effect than its effect on the headcount would suggest. Indeed, it reduces poverty depth and severity significantly more than incidence. When the transfer program is however from other sources (taxes or grants), it produces a very similar effect at the national level for the depth and severity poverty indices. For the headcount ratio, the four simulations are not as positive as simulation 3. In Senegal, transfer from import duties or foreign aid would however have a somewhat stronger impact on poverty depth and severity that self financed programs by the operator or financed by income taxes.

It is interesting to see if our findings will be modified when performing a decomposition poverty analysis. Tables 6 to 8 summarize the results. It is important to note that when using empirical distribution to compute poverty a headcount index for small groups we often obtain weak or no effects. This comes from the fact that few households can be observed around the poverty line. For example, in Table 6, the smallest group (rural educated) is unaffected in all simulations when using the poverty headcount index. This group represents less then 4% of the sample. In this context the poverty depth and severity indices are much more informative.

Table 6: Variation of poverty incidence by regional/educational decomposition

FGT $_0$: Poverty incidence								
Code Group	**Base**	**Sim 1**	**Sim 2**	**Sim 3**	**Sim 4**	**Sim 5**	**Sim 6**	**Sim 7**
DKE	**23.18**	**0.00**	**-0.85**	**-1.44**	**-1.44**	**-1.44**	**-1.44**	**-1.44**
DKNE	**43.34**	**0.00**	**-0.51**	**-0.19**	**0.63**	**0.63**	**0.63**	**0.63**
AUE	**28.38**	**0.88**	**-3.01**	**-3.01**	**-3.01**	**-3.01**	**-3.01**	**-3.01**
AUNE	**51.02**	**1.46**	**-0.02**	**-0.70**	**-0.70**	**-0.70**	**-0.70**	**-0.70**
RE	**54.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
RNE	**73.25**	**0.22**	**-0.03**	**-0.40**	**-0.29**	**-0.40**	**-0.40**	**-0.40**
NSW	**72.59**	**0.33**	**0.33**	**0.44**	**0.56**	**0.56**	**0.56**	**0.56**
SW	**41.66**	**0.28**	**-1.19**	**-2.33**	**-2.10**	**-2.33**	**-2.33**	**-2.33**

Source: from authors' computation

The upper part of Table 6 does, however, suggest that cost recovery efforts and transfer programs would impact users with different educational levels very differently. The first simulation shows that the improved cost recovery leads to an increase in poverty for three groups: the other urban non educated "(AUNE), the other urban educated (AUE) and the rural non educated (RNE). The lower part of the table tracking the difference in the impact for water users supplied by SDE and the others shows a surprising result. Indeed, the poverty level increases more for households not supplied by the SDE (NSW) albeit not much stronger (0.33% versus 0.28%). This tells us that the general equilibrium effects on prices and wages play a more important role in determining the final effects of this policy on households than on the increase in the price of water. It also reflects the fact that some of the NSW providers are SDE client and pass on the increase of water onto their own users.

However, when looking at the depth and severity changes in Tables 7 and 8, we see that households supplied by SDE experience stronger poverty increases (i.e. 0.31% vs. 0.16% for depth and 0.50% and 0.22% for severity). Similar conclusions can be drawn from FGT_2 with the

regional decomposition where the Dakar educated (DKE), Dakar non educated (DKNE), other urban educated (AUE) suffer the most (as the main users of water supplied by SDE.

Table 7: Variation of poverty depth by regional/educational decomposition

FGT $_1$: Poverty depth								
Code Group	**Base**	**Sim 1**	**Sim 2**	**Sim 3**	**Sim 4**	**Sim 5**	**Sim 6**	**Sim 7**
DKE	**0.22**	**0.17**	**-0.77**	**-1.37**	**-1.68**	**-1.73**	**-1.75**	**-1.74**
DKNE	**0.21**	**0.40**	**-1.28**	**-2.20**	**-2.58**	**-2.22**	**-2.26**	**-2.24**
AUE	**0.11**	**0.49**	**-1.47**	**-2.50**	**-2.35**	**-2.48**	**-2.55**	**-2.54**
AUNE	**0.20**	**0.46**	**-1.52**	**-2.62**	**-2.44**	**-2.51**	**-2.57**	**-2.56**
RE	**0.26**	**0.18**	**-0.17**	**-0.31**	**-0.19**	**-0.30**	**-0.32**	**-0.33**
RNE	**0.33**	**0.16**	**-0.27**	**-0.47**	**-0.38**	**-0.44**	**-0.46**	**-0.46**
NSW	**0.34**	**0.16**	**0.15**	**0.24**	**0.33**	**0.26**	**0.24**	**0.23**
SW	**0.20**	**0.31**	**-1.78**	**-3.05**	**-3.16**	**-3.09**	**-3.14**	**-3.13**

Source: from authors' computation

For the second simulation (when SDE is responsible for the financing of transfers), we obtain an interesting reduction in poverty for the Dakar educated (DKE) and non educated (DKNE) and the other urban educated (AUE) where improvements go from -0.51% to -3.01% (Table 6). The transfer program has a positive effect on the SDE water consumers but a negative effect on the non SDE consumers. The tendency is similar for the two other indices where urban households benefit the most and rural households are only slightly affected by a positive effect. Simulation 3 yields similar results although with generally stronger effects.

Table 8: Variation of poverty severity by regional/educational decomposition

FGT $_2$: Poverty severity								
Code Group	**Base**	**Sim 1**	**Sim 2**	**Sim 3**	**Sim 4**	**Sim 5**	**Sim 6**	**Sim 7**
DKE	**0.06**	**0.78**	**-2.10**	**-3.58**	**-3.53**	**-3.81**	**-3.85**	**-3.81**
DKNE	**0.11**	**0.62**	**-2.34**	**-3.99**	**-3.88**	**-4.00**	**-4.07**	**-4.04**
AUE	**0.06**	**0.68**	**-1.30**	**-2.17**	**-1.97**	**-2.15**	**-2.25**	**-2.23**
AUNE	**0.13**	**0.50**	**-1.84**	**-3.10**	**-2.96**	**-3.01**	**-3.08**	**-3.07**
RE	**0.19**	**0.25**	**-0.02**	**-0.03**	**0.10**	**0.00**	**-0.03**	**-0.04**
RNE	**0.22**	**0.21**	**-0.30**	**-0.51**	**-0.41**	**-0.48**	**-0.51**	**-0.51**
NSW	**0.22**	**0.22**	**0.20**	**0.32**	**0.43**	**0.35**	**0.32**	**0.31**
SW	**0.09**	**0.50**	**-2.86**	**-4.84**	**-4.73**	**-4.81**	**-4.87**	**-4.86**

Source: from authors' computation

Overall, one of the most interesting conclusions of these simulations may be that impact of the different funding programs for transfers should leave in general the poor relatively indifferent but they should be of interest the uneducated users and to the users not supplied by SDE . The only poverty headcounts affected are the Dakar non educated (DKNE) and the rural non educated (RNE). For the DKNE group, we have an increase in the poverty rate instead of the decrease observed when the operator is allowed to rely on cross subsidies. For the RNE group, the decrease in poverty is smaller when using the income tax to fund the transfer program (simulation 4). Finally, there is a stronger increase in poverty for the four cases for the users unable to rely on SDE (the NSW group), confirming that the reforms are likely to have had an impact even on the users not supplied by the utility operator. Note that many of these simulations clearly show that allowing cross-subsidies (simulation 3) may have desirable poverty payoffs as compared to alternative funding sources. Indeed, the poverty rate does not decrease as much when using the household income tax for the households supplied by SDE (SW).

There is also a regional incidence story that emerges from the analysis of the funding schemes. In general, the funding schemes most favorable to most groups are the increase in import duties and in foreign aid. However, only two groups do not benefit from an improvement of the FGT_1: the non educated in other urban centers and in rural areas, implying that Dakar would be the clear winner of most common funding schemes. In particular, funding the transfers program through a household income tax only improves the average situation for the two groups in Dakar (DKE and DKNE). [29].

[29]If we had assumed that *public services* generate production externalities or provide utility to households we would have had different results since the third simulation generates a 1.48% decrease in public services. This reduction in public services produces little impact on the economy other than the downward pressure on wage See Savard and Adjovi (1998) for an explicit modeling of public expenditure externalities namely in the primary education and primary health sectors.

6. Impact of funding schemes on the income distribution

To analyze more formally the changes in income distribution we use the Gini index. Results of variation from the index for Senegal and for subgroups of the population are presented in Table 9. The first observation concerning the inequality changes is that the effects are relatively small. No changes above 1.5% are observed for all groups in any simulation. The second general observation is that all policies simulated reduce inequalities at the national level and for the sub-groups analyzed with the exception of the first simulation, which slightly increases inequalities for two groups (Dakar educated and non educated). This is somewhat surprising since both the reforms and the various funding schemes simulated in section 5 tended to leave the users in Dakar relatively better off on average.

Overall, the distributional effects are not very dramatic although they show that redistribution intra- and inter-groups has very different impacts. The inter-group redistribution contributes to reducing overall inequalities but the intra-group redistribution contributes to an increase in the overall inequalities. The urban non-educated users tend to lose relatively more as well and for some of them, The RNE are consistently the least affected regardless of the simulation.

Table 9: Variation of Gini index

S-Gini indice									
Group #	**Définition**	**Base**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	National	**0.51**	**-0.04**	**-0.33**	**-0.54**	**-0.64**	**-0.49**	**-0.49**	**-0.48**
Region	**Inter-group**	**0.40**	**-0.07**	**-0.38**	**-0.63**	**-0.72**	**-0.54**	**-0.54**	**-0.53**
	Intra-group	**0.10**	**0.06**	**-0.13**	**-0.22**	**-0.31**	**-0.27**	**-0.28**	**-0.29**
Région	**DKE**	**0.54**	**0.03**	**-0.26**	**-0.45**	**-0.59**	**-0.49**	**-0.50**	**-0.50**
	DKNE	**0.47**	**0.04**	**-0.57**	**-0.97**	**-1.26**	**-0.96**	**-0.96**	**-0.95**
	AUE	**0.42**	**0.00**	**-0.41**	**-0.69**	**-0.74**	**-0.59**	**-0.61**	**-0.59**
	AUNE	**0.40**	**-0.02**	**-0.71**	**-1.21**	**-1.39**	**-1.19**	**-1.21**	**-1.21**
	RE	**0.52**	**-0.07**	**-0.20**	**-0.33**	**-0.27**	**-0.19**	**-0.19**	**-0.17**
	RNE	**0.38**	**-0.01**	**-0.12**	**-0.20**	**-0.28**	**-0.20**	**-0.20**	**-0.21**
Water	**Inter-group**	**0.27**	**-0.06**	**-0.22**	**-0.37**	**-0.46**	**-0.31**	**-0.31**	**-0.30**
	Intra-group	**0.23**	**-0.02**	**-0.44**	**-0.75**	**-0.85**	**-0.70**	**-0.70**	**-0.69**

Water	**SE**	**0.41**	**-0.03**	**-0.03**	**-0.06**	**-0.14**	**-0.03**	**-0.03**	**-0.03**
	E	**0.51**	**-0.01**	**-0.65**	**-1.09**	**-1.20**	**-1.03**	**-1.04**	**-1.02**

Source: from authors' computation

Finally, the simulations suggest that inequalities for the RE are cut under all funding approaches. The household income tax approach (simulation 4) is the one that reduces the inequalities for most groups (five out of six). The last three simulations have little effect on the other groups excluding the Dakar educated (DKE). The analysis based on the water supply source produced expected results. We observe very little impact on the households not supplied by SDE (from -0.03% to -0.14%). As for the households supplied by SDE, we have reductions ranging from 0.01% for the first simulation to 1.2% for the fourth simulation (funding of the transfer program through the income tax).

7. Conclusion

In this paper, we first analysed the evolution (before and after reform) of the water supply distribution in a sector now dominated by a privatized water utility. We analyze first the raw data extracted from household surveys. Although the average access rates have increased, we find that the expansion of the network associated with the reforms did not benefit the two lowest quintiles of the population much. The biggest gainers are the upper middle class (the fourth quintile).

We then use an integrated multi-household CGE model approach to analyze the relevance of the interactions of the effects of possible pricing and financing changes consistent with the committed reforms with all other social and economic dimensions of interest to policymakers. The analysis confirms that, as expected, when the general equilibrium effects are accounted for,

all groups are negatively affected with the efforts to improve cost recovery unless the poor households are compensated after the associated price increase.

The analysis also shows that, through transfer programs, all groups in the regional decomposition appear to benefit from the reform whatever funding source is used to fund the program. The gains are however not evenly distributed. The group winning the least seems to be the rural educated in all the scenarios with the transfer program. However, when using decomposition based on source of water supply, the transfer program is favourable to the households supply by SDE water and unfavourable to the other households. This conclusion is valid for all the different funding options. The drivers of these results are price effects and income effects which are both captured in this analysis.

An additional interesting finding in looking at the regional decomposition is that in general, the urban dwellers are the most strongly affected, followed by the Dakar households and then the rural households. This conclusion is not surprising for the rural as they are mainly affected by the general equilibrium effects. However, we expected stronger effects on the Dakar households. As for the educational decomposition, the non-educated lose more in all regions when no compensation is implemented and gain more with the compensation policies. This result is interesting insofar as these non educated groups exhibit poverty level twice as large as their educated counterparts. They are largely driven by the fact that the poorest, who are also the least educated, are less likely to be connected to the network.

Because the actual pricing and financing data necessary to conduct a full incidence analysis is not available, we cannot make a definitive assessment of the impact of reforms on the poor based on facts, However, the pricing and financing simulations conducted in this paper show that even if the impact on the network extension analyzed in the first part was not as kind

to the poor as expected, it would be easy to design pricing and financing to ensure a progressive reform outcome. This outcome is actually relatively easy to implement given the low efficiency cost of implementing a compensation program for poor households affected by the water price increase. This result is robust to different funding scheme to the transfer program.

Beyond Senegal's experience, the main interest of this paper may have been to show that that the IMH-CGE approach could be used quite effectively to study the incidence of pricing and financing policies often associated with privatization of utilities. It adds to results achieved from the earlier CGE generations the evidence that detailed knowledge of household level data can be extremely valuable in designing compensatory programs. Overall, it provides fairly precise information regarding winners and losers at the macro, sectoral and micro levels

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Appendix

Cost structure of the formal water production sector

CAPEX	Capital payments and investment	9227
OPEX	Labor Cost	5441
	Intermidiate input -other industries	15543
	Intermidiate input -Construction	331
	Intermidiate input -Hotel and restaurant	72
	Intermidiate input -Energy	197
	Intermidiate input -Telecom	134
	Intermidiate input -Water	37
	Intermidiate input - Electricity	86
	Intermidiate input - Transport	59
	Intermidiate input -Commercial services	398
	Intermidiate input -Other services	10009
Value of sales	Total output at factor price	41534
Losses 1996		463