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Analysis of the efficiency of public policy on the supply of social housing in a poor country

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Abstract

The objective of this article is to evaluate the technical efficiency of the national programme of supply of social housing in a poor country such as Cameroon. The study is based on a period of ten years. The programme involves 51 enterprises with 46 SMEs and 5 multinationals. The data used is from the state institution responsible for urbanisation and habitats. The efficiency frontier is evaluated using the Data Envelope Analysis (DEA). We calculate the scores of pure technical efficiency and efficiency of scale. We obtain the following results: a)-enterprises engaged in the realisation of the national programme of supply of social housing are 98% sub-optimal b)-the inefficiency observed is due to pure technical efficiency. These results reveal lapses in the management of available financial, technical and human resources. The causes can be related particularly to the lack of operational experience, insufficient training and the use of traditional techniques that are not adapted to the exigencies of efficiency.

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1 .Introduction

According to ONU-Habitat, the supply of housing is usually limited in developing countries by inappropriate governance systems and the lack of human resources as well as by institutions and regulations that are either obsolete, lack the capacity or have insufficient information. As such almost 70% of the population of developing countries do not have comfortable housing (ONU-Habitat, 2012). Cameroon like most Sub-Saharan African countries has a lot of difficulties in supplying convenient houses to its population. According to the National Institute of statistics (INS, 2015) Cameroon has a deficit of more than one million houses. This situation is more devastating for poor and very vulnerable populations. About 60% of the population lives under conditions of extreme poverty, given this situation and the necessity of equity and equality, Cameroon has engaged a vast programme of supply of social housing for more than one decade. These programmes find their theoretical basis in a dual function of allocation and distribution by the state (Musgrave, 1959; Adam, 2013). The intervention of the state in the housing sector in Cameroon is not new. It dates back to the 1960s with the creation of several institutions[1]. The role assigned to these institutions was to create financial and environmental conditions and optimal techniques for the putting in place of social housing. After more than thirty years of activity these institutions have succeeded in producing only 20, 000 social houses (NIS, 2015). This represents less than 2% of the demand expressed. On this basis Cameroon initiated a restructuring plan aimed at increasing the volume of social housing available. The total cost of financing the programme engaged since 2008 is estimated at about 907.1 billion CFAF (MINHDU, 2018). It is aimed at improving the production of 50, 000 houses. The programme mobilises Small and medium sized enterprises (SME) as well as multinationals in the construction sector. Finally, the institutional reforms engaged by the Minister in charge of housing and urban development (MINHDU) lead to an increase in 60% of the budget allocated to the ministry (NIS, 2015). In a context in which the intervention capacity and the resources of the public authorities are limited, the analysis of the efficiency of public policies put in place is worthwhile. The objective of this study is to evaluate the technical efficiency of the national programme of social housing in Cameroon.

This study is of particular interest in that it constitutes the first application of the efficiency of public policy on housing in Cameroon.

From a practical stand point, this study finds its justification in the rationing of public resources in a context of crisis. The results of this study can be used by public authorities to improve the quality of management of resources available in the housing sector. The rest of the article is presented as follows: the second section

[1] The institutional framework created by the state is essentially made up of structures such as: Credit Foncier du Cameroon, created in 1977, the mission of rehabilitation and equipment of Urban and Rural areas (MAETUR) created in 1977 and the Société Immobilière du Cameroun (SIC), that was created in 1952.

presents the literature review. The third presents the methodology adopted and the fourth section gives the results obtained and the fifth section concludes.

2. The literature review

According to economic theory, the intervention of public action in the housing sector is justified by the absence of a complete market system that enables to attain an optimal economic and social equilibrium (Jevons, 1871; Pareto, 1906). One of the critics on the laissez faire, is on the non-automatic nature of the equilibriums attained by the market and the absence of a social optimum. In this case, the market economy can not be considered as a mechanical institution nor the radical lapses of the state but should be structured around rules and supported by a reasonable intervention of the state. Housing is an asset with a long life span (Modigliani, 1954) having externalities (Marshall, 1890) and whose consumption generates transaction costs (Coase, 1937). Public authorities have to take the responsibility of producing houses with the aim of having a mastery of transaction costs as well as the consequences of externalities. The intervention of public authorities in the housing market could equally reduce inequalities from the spatial imperfection of the market (Kline and Moretti, 2014). This vision is supported by the thesis of social justice (Rawls, 1971; Sen, 2005; 2010).

Based on the theory of endogenous growth housing enables to structure human capital and reinforce productive potential of the population (Klaassen and Burns, 1963; Abrams, 1964; Myrdal, 1971; Mayo and Stein, 1995; Pogodzinski, 1995 and Hacker, 1999). Moreover, the evaluation of the efficiency of public policy is in line with the New Public Policy Management (Fayol, 1918; Weber, 1970; Amar and Berthier, 2007; Dunleavy et al. 2006). The idea defended is that of the performance of public action. This new form of public management is based on the culture of results.

From a conceptual view point, the notion of efficiency can be apprehended through the studies of Debreu (1951), Koopmans (1951) and de Farrell (1957). According to these authors, the conception of efficiency has to be done on the prism of its source. As such two sources are generally associated to it. The first source is technical and the second is allocative. According to Farrell (1957) the technical efficiency expresses the choice of the quality of inputs necessary for an enterprise to attain a given level of production. Technical efficiency assumes the use of resources so as to maximise production (Atkinson and Cornwell, 1994). On the contrary, allocative efficiency translates the optimal choice of the different baskets of input relative to the market price. Thus, allocative efficiency expresses the quality of a return that enables to realise objectives with minimum means engaged.

Even though the debate on efficiency is old, efficiency has regained vitality through the development of the neo-liberal school of thought supported by the World Bank and international financial institutions. The exigencies of efficiency of public policy have become a major preoccupation given the trends of world

economies. The generalisation of principles of efficiency in all aspects of the economy has increased. The housing sector is not except from these exigencies of efficiency.

Most studies relative to efficiency of public policy on housing focused on the controversy around the choice between instruments of public assistance to persons and public assistance to the stone (Grislain and Trévien, 2014; Le Bayon et al. 2013; Nicholas and Zeckhauser, 1982; Porteba, 1984; Blackorby and Donaldson, 1988). Through the first instrument the state supports the solvency of low income households, on the real estate market. The second instrument is state subventions or fiscal advantages that boost supply and increase the rate of access to housing. The evaluation of the efficiency of these two instruments is based on their incidence in terms of targeting poor households, the risk of eviction of the private sector and the inflationist risk of rents. According to several studies carried out in the French case (Gobillon and Leblanc, 2005) and American (Siani and Waldfolgel, 2002), assistance to persons could be less costly and more efficient. For the others assistance in real estate generates eviction effects in the private housing market. The studies of Porteba (1984) carried out in the American context examine the incidence of subventions granted to proprietors on the rents in the private sector. According to the author fiscal subventions to proprietors explain 30% of increase in the prices of real estates. These results are confirmed by the studies of Susin (2002), Leblanc and Laferrère (2002) and of Gibbons and Manning (2003) carried out respectively in France and the United Kingdom. Even though these results are wildly approved they have one major criticism.

The studies mentioned above are limited to the analysis of the efficiency on the prism of the solvency of households and the effects on the market. This is very comprehensive in a precise context where the housing market is well developed. But these studies do not take into account the direct intervention of the state as promoter of real estate. Given that in some contexts and especially those of underdeveloped countries, the state intervenes directly in the production of real estate. This requires the use of a certain number of inputs targeted towards a given volume of output. The previous studies ignore the evaluation of the efficiency of public policy in terms of input and output. But in a context in which the state has less financing the rationality of public expenses is necessary. Such a procedure requires this study.

3. Methodology

In this section we will first present the data followed by the description of variables and finally we will specify the model of analysis.

3.1. Data and variables

We use the data base of the ministry of Housing and Urban Development (MINHDU, 2018). This database contains information relative to the volume of investment realised by the state to increase the supply of social housing in Cameroon. This database contains amongst others information relative to the number of technical partners the number of plots of land rehabilitated and the number of houses constructed during the last ten

years. The available data is spread over a period of ten years from 2008 to 2018. 51 enterprises were retained for the realisation of this programme among which 46 are Small and Medium sized enterprises (SMEs) and 5 are multinationals (MN).

The choice of inputs and output

Classically the production of houses requires the availability of viable plots of land, the availability of long term finance, the presence of a qualified man power and the use of technology. In this study plots of land are the physical capital. The volume of financing invested represented the financial capital.

As for the factor labour, literature is divided. The factor labour can take the form of the number of employees. It can also take the form of expenses on the salary of employees. It can finally take the form of the number of hour of labour. Given that our data base does not have this information, we have assumed that the factor labour was constant for all the enterprises. This hypothesis is however strong but it has no impact on the analysis carried out. For we assume that the finances invested by the enterprises enable to bear the financial engagements related to salary package of the enterprises. Moreover we do not have information on the technology used by enterprises in this database. For all these reasons we retain as input: the finances invested and the number of plots of land rehabilitated for the construction of houses. The output retained is represented by the number of houses constructed. The statistics relative to these different variables are summarised in table below.

Table I : Statistics of inputs and output

	N	Minimum	Maximum	Mean	Standard deviation
Volume of financing	10	5000000000,00	25000000000,00	13200000000,0000	7743097284,39179
Number of plots of land	10	225,00	1500,00	798,5000	569,15654
Number of houses constructed	10	120,00	1520,00	889,0000	473,95382
Valid Observations	10				

The table above indicates that during the last ten years the state has invested on average 132 billion of CFAF, rehabilitates 785 plots of land and constructed on average 889 houses. We can deduce that on average the number of houses constructed per year is 88 houses. This number is very insufficient with regards to the demand that is about 200 thousand houses annually. These first tendencies, leads us to question the real level of effectiveness of the program. The evaluation of the level of efficiency that follows enables us to determine the source.

3.2. Specification of the model

We evaluate the technical efficiency of public policy of supply of social housing. In order to do this we follow the approach of the production frontier. The choice of the method of estimation of the frontier can be done according to the form of the frontier, according to the nature and properties of the gap between observed production and optimal production. As for the form of the frontier, we assume that there does not exist a pre-established form of the frontier. In this case we use a non-parametric frontier (Murillo-Zamarano, 2004). Moreover, using the convexity of all the production we retain the Data Envelop Analysis (DEA) as method of estimation as proposed by Charnes et al. 1978 ; Bankeret al (1984). Following Banker et al. (1984) we assume that the returns to scale are variable. This choice is justified by the fact that in Cameroon the production of housing is carried out in sub-optimal conditions with an under utilisation of factors of production. However, the hypothesis of variable returns to scale enables to distinguish pure technical efficiency and technical efficiency of scale.

If we consider n as the number of enterprises that one wants to evaluate and assume that each enterprise uses a set of inputs $n \epsilon R_+^p$ to obtain: R_+^q. In addition we assume that the set of points susceptible to be realised is denoted:

$$\Phi = \{(x, y)\epsilon R_+^{p+q}\}. \quad (1)$$

All the outputs susceptible to be obtained from a given level of inputs is represented by the production technology. Formally, the available technology is given by:

$$P\ (X) = \{y\ \epsilon\ R_+^{p+q},\ \ (x, y)\epsilon\Phi\} \quad (2)$$

The definition of the maximum level of production is given by:

$$\partial P\ (x) = \{y\ |y\ \epsilon\ P(x), \lambda_y \notin P\ (x)\forall\ \lambda > 1\}. \quad (3)$$

Based on the above, the score of efficiency evaluated for a precise point $(x_0, y_0)\ \epsilon\Phi$ is given by:

$$\lambda\ (x_0, y_0) = \sup\{\lambda\ |\lambda_{y0}\epsilon\ P(x_0)\} \quad (4)$$

The appreciation of the scores obtained is done according to unitary namely equal to or higher than unitary. Nevertheless, the version of orientation of outputs retains that the score is between 1 and plus infinitive.

4. The results

The results obtained are presented in the table below:

Table II. Scores of efficiency per year and according to the technical partners

Technical partners per year	Technical Efficiency with constant returns to scale	Technical Efficiency with variable returns to scale : pure technical efficiency	Efficiency of scale
The year 2008 with 6 SME	0.236	0.470	0.501
The year 2009 with 10 SME	0.414	0.475	0.871
The year 2010 with 8 SME	0.872	1.000	0.872
The year 2011 with 9 SME	0.611	0.624	0.979
The year 2012 with 13 SME	1.000	1.000	1.000
The year 2013 with 1 MN	0.801	0.820	0.977
The year 2014 with 1MN	0.513	1.000	0.513
The year 2015 with 1MN	0.446	1.000	0.446
The year 2016 with 1MN	1.000	1.000	1.000
The year 2017 with 1 MN	0.164	0.308	0.531
Mean	**0.606**	**0.770**	**0.769**

The results obtained is spread over a period of ten years. We have decomposed the technical efficiency into pure technical efficiency and efficiency of scale (Koopmans, 1951). We first identify the most efficient enterprises and then we evaluate the mean score of the efficiency of enterprises. Moreover we discuss about economies of scale of the enterprises and the comparison between technical efficiency and pure technical efficiency. And finally we draw implications in terms of economic policy.

The results of the table above show that 35.29% of the enterprises engaged are efficient. They are on the efficiency frontier. They are 13 SME (the year 2012) and 1 multinational (the year 2016). The mean scores of technical efficiency, pure technical efficiency and efficiency of scale for all the enterprises are respectively of 0.606 and 0.769. This result suggests that the enterprises engaged in the realisation of the national programme of supply of social housing are 'sub-optimal'. In general, they are situated below the frontier of efficiency. It is therefore possible to increase by at least 39% (in a situation of constant return to scale) or by about 23% (in a situation of variable return to scale) the quantity of houses produced by the enterprises but maintaining the same level of input used (volume of finance and number of plots of land).

The comparison between pure technical efficiency and efficiency of scale reveal that: with the exception of the years 2012 and 2016, the scores of technical efficiency are all less than those of pure technical efficiency. This result translated the idea that the efficiency of enterprises involved in the programme of supply of social housing in Cameroon is explained more by pure technical inefficiency (that can be linked to insufficient correlated management which linked to poor equipment, the quality of human resources and to experience),

than by inefficiency of scale. In terms of policy this result suggests an improvement in the know-how of enterprises based on rational management of resources available.

5. Conclusion and implications

The study had as objective to evaluate the level of technical efficiency of the national programme of social housing in a poor country, Cameroon in particular. It finds its justification in a context plagued by a deep housing crisis leading to vulnerable living conditions. The quest for social justice based on the reduction of inequalities reinforces the intervention of the state. Ten years after the launching of the national programme of social housing one can raise questions on the rationality of the public resources used and the results obtained. To evaluate the efficiency of this programme we used information from the database of the Ministry of Housing and Urban Development (MINHDU, 2018), between 2008 and 2018. Using the Data envelop Analysis (DEA), we measure the efficiency of the programme on a sample of 51 enterprises retained. We decompose technical efficiency into pure technical efficiency and efficiency of scale. The results obtained highlight two major points: 1)-the calculation of the mean score of efficiency reveal that in general that the enterprises engaged in the programme are 98% sub-optimal. 2)-technical inefficiency is explained better by pure technical inefficiency than by inefficiency of scale. Consequently, a major economic policy recommendation can be formulated: the reinforcement of the efficiency of the programme of supply of social housing in Cameroon necessitates an improvement in the management of the available resources. It has to be based on financial management and the rationing of plots of land available. This rational management of resources would enable to increase on average by at least 39% (in a situation of constant returns to scale) or by about 23% (in a situation of variable returns to scale), the quantity of houses produced by the enterprise while maintaining the level of output used. Previous studies could evaluate the determinants of the inefficiency of the programme.

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