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**What contexts are favorable for the adoption of the contract
teacher policy?
The case of the Francophone African countries**

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Abstract

Education systems in Francophone African countries are undergoing major reforms, consequence of the international commitment to achieve Universal Primary Education (UPE) by 2015. Teachers' recruitment is among the most important reforms for at least two reasons: first, various researches presented it as necessary otherwise UPE will not be achieved; second, the alternative policy proposed is unpopular as new teachers are recruited with lower qualification, receive lower salaries and have a less secure job position. Yet, some governments have succeeded in changing their teacher recruitment scheme and others have not. Conditions allowing a government to make the reform are still uninvestigated. This paper fills the gap by examining the origin of this new policy and the existence of a favorable context allowing the reform. Using a model of innovation and diffusion it identifies the severity of the teacher shortage, the strength of teachers unions, the existence of considerable number of non civil servant teachers and the dependence on external aid as conditions that can trigger the adoption of the reform. Applying crisp-set Qualitative Comparative Analysis on a sample of Francophone African countries, it is established that there is not a unique context leading to the reform, but contract teacher policy was adopted under distinct contexts. The results highlight areas for future investigations in the understanding of policy making in sub-Saharan Africa.

Key words: *Education, Contract teachers, Policy analysis, sub-Saharan Africa, Qualitative Comparative Analysis (QCA)*

Résumé

Depuis l'engagement des pays à atteindre la Scolarisation Primaire Universelle (SPU), les systèmes éducatifs des pays africains subissent de nombreuses réformes. Le recrutement des enseignants est une contrainte forte de ces réformes pour au moins deux raisons ; premièrement, des recherches ont montré qu'il est nécessaire de recourir à des politiques alternatives de recrutement sinon l'objectif de SPU ne sera pas atteint ; deuxièmement, la réforme proposée est controversée car elle suggère le recrutement des enseignants moins qualifiés, moins payés et avec des contrats de travail moins attractifs que celui des enseignants fonctionnaires. Cependant, certains gouvernements ont réussi à adopter la réforme et d'autres non. Les conditions qui rendent la réforme possible demeurent en l'état de la littérature non examinées. Cette étude aborde cette question en analysant s'il existe un contexte facilitant l'adoption de la réforme. Elle utilise le modèle d'innovation et de diffusion pour identifier la sévérité du manque d'enseignant, l'influence des syndicats d'enseignants, l'existence d'un nombre important d'enseignants non fonctionnaires et la dépendance vis-à-vis de l'aide internationale comme conditions pouvant provoquer la réforme. Appliquant la technique analyse quali-quantitative comparée sur un échantillon de pays Francophones, cette recherche établit qu'il n'existe pas un contexte unique menant à la réforme, mais qu'en réalité, les gouvernements ont réformé les voies de recrutement des enseignants sous des contextes divers. Les résultats identifient

également de nouveaux axes de recherche en vue d'une meilleure compréhension des processus d'élaboration des politiques publiques dans les pays d'Afrique sub-saharienne.

Mots clés : *Education, Enseignants contractuels, Analyse politique, Afrique sub-saharienne, Analyse Quali-Quantitative Comparée (AQQC)*

1. Introduction

The commitment of the international community to achieve Universal Primary Education (UPE) has induced major changes in the objective and management of the education system in sub-Saharan African countries. In these countries, the aim of the education system was initially to train the elite that will then served in the government. Consequently, only few students were enrolled to school and education spending was realized without particular attention to the budgetary constraints. The largest share of the education budget was used to remunerate teachers; their salaries were set at a level deemed by some education analysts as high compared to countries' income.

After countries committed themselves to achieve UPE, various policies were implemented in order to bring children to school. As a result, the number of pupils increased significantly. Soon, education systems were confronted with a lack of teachers. Estimations from UNESCO show that sub-Saharan African countries must recruit more than 1.6 million teachers before 2015 in order to achieve UPE (UNESCO-UIS (2006), p. 42). Many studies pointed out that this situation is due to high teacher salaries (Zymelman and DeStefano (1989), Orivel (1991), Mingat and Suchaut (2000), Mingat, Rakotomalala and Tan (2003)) and concluded that a reform of the teacher recruitment policy is necessary if UPE is to be achieved.

Recent years have witnessed the recruitment of a new type of teachers called contract teachers. As compared to the traditional civil servant teachers, a contract teacher is characterized by a shorter term contract, a lower salary and a shorter duration of pre-service training. Opponents to the reform considered contract teachers' working conditions as precarious and predicted a decrease of the quality of education. However, many sub-Saharan African governments adopted the new teacher recruitment scheme.

Contract teacher policy is a rather recent phenomenon in sub-Saharan Africa; thus, research on this policy is very limited. Moreover, existing works focus exclusively on its impact on teachers' motivation and education outcomes (Bernard, Tiyab and Vianou 2004; Bourdon, Frölich and Michaelowa 2007; Duthilleul 2005; Michaelowa 2002; PASEC 2003, PASEC 2004 and PASEC 2005; Vegas and De Laat 2003). Little attention has been paid to the political aspect of the reform. For instance reasons why some countries have not adopted the reform although it is considered as an unavoidable path towards UPE remain uninvestigated. The aim of this study is to complement the knowledge by examining the existence of a context that may facilitate or prevent the adoption of the contract teacher policy.

In the following, section 2 describes the evolution of the education system in sub-Saharan Africa and shows how the teacher policy became a major issue. Section 3 looks into the literature on policy

reform and draws conditions that can trigger the adoption of the contract teacher policy. These conditions derive from the model of policy innovation and diffusion developed by Berry and Berry (2007) and from recent works on policy diffusion. Using a sample of Francophone African countries chosen for their similarities regarding education issues, the contexts actually observed when governments adopted the reform are described. Given the size of the sample (14 countries), the method crisp-set Qualitative Comparative Analysis (csQCA) is employed: this method and the data are presented in section 4. Results are discussed in section 5; they point out that the reform occurred under various contexts. This result in combination with the way the contract teacher policy spread in Francophone African countries raise key questions for future investigations. Section 6 draws conclusions.

This research focuses on primary education because this level is the most targeted by UPE¹.

2. Universal Primary Education and the emergence of a new teacher status in Francophone Africa

In Africa, formal education as taught in schools was initiated during the colonial era by missionaries under the monitoring of the former colonizer (UNESCO (1960)). Later, while the authorities in English colonies relied on local communities to shape the education system according to citizens' needs, in French colonies, authorities gradually took the lead in the provision of education services². Therefore differences have emerged among these groups of nations in pedagogical practices, criteria for recruiting teachers, employment policies and so on whereas essential within similarities have developed (Garnier and Schafer 2006, p. 155).

The mission of the school in French colonies was to train the elite so they could serve as intermediary between the colonizer and the population (White 1996, p. 12). Consequently, a small number of teachers were needed to train the equally small number of students. In line with the policy of assimilation used by France to rule its colonies³, teachers were recruited with a high level of qualification and were receiving relatively high salaries⁴. All the teachers were recruited as civil servants, a status associated with a labour contract of unlimited duration, the possibility to increase the level of salaries with seniority and/or by increasing own level of qualification (for example by attending an additional training).

¹ Contract teachers exist at different level of education, but those in secondary or tertiary education can be submitted to different contract conditions as compared to contract teachers in primary education.

² English and French colonies represent the largest share of African countries.

³ This policy states that citizens in colonies should not be considered differently from citizens in France.

⁴ The Lamine Gueye's law II, adopted at the French national assembly in 1950, states that all civil servants' salaries in the colonies should be set at the same level as in France. For more details, see Bourdon and Nkengne Nkengne (2007, p5).

After independence, when the civil service had to be staffed with nationals, human capital was scarce and therefore highly remunerated⁵. Moreover, many Francophone African governments maintained the elitist view of the education system. This resulted in building a sacred view of the teacher position over years. The main sign of the privileges given by governments to teachers happened when a particular statute for teachers was adopted. It states that in addition to privileges to all civil servants, teachers will receive additional privileges like housing, medical care, etc.

For a long time, governments were the only real actors in education policy making. Their power starts decreasing when the international community agreed to rich Universal Primary Education (UPE). This desire was first mentioned in 1961 in Addis-Abeba during a regional conference on education (Bianchini 2004, p. 179). It was a signal that schools, at least at the fundamental level, should be opened to all the children and not only to the elite. From that moment, decisions on education goals were no more taken only at the national level, but also at the international level. A larger commitment to achieve UPE took place in 1990 at the World Education Forum held in Jomtien when countries around the world promised to bring education to all their citizens, objective which was reaffirmed during another World Education Forum held in Dakar in 2000. The challenge was to transform an education system initially devoted to a small number of children into an education system able to accommodate millions of children (mass education). Therefore, various policies were implemented at national and international levels in order to meet the target: free primary education, nomadic schools (UNESCO 2007; De Ravignan 2007), compulsory education, modifications of curricula, etc. However, the share of children out of school remains high; a report published by the UNESCO in 2005 estimates that 45 million children⁶ in sub-Saharan Africa are out of school (UNESCO 2005, p. 3). Why is it the case? What can be done? Debates on potential answers were and still salient. Among the reasons identified, budgetary constraint was said to be an important issue. Given African countries' level of income, concerns arose on their ability to supply education (class construction, book provision, teacher recruitment, etc.) in a context of a rapidly increasing demand. A major worry was on teachers for at least two reasons: i) they are at the center of students learning and therefore should enjoy good working conditions (training, salary, motivation, etc.) ii) their salaries account for 90% to 95% of the primary school recurrent budget (Zymelman and DeStefano 1989, p. 9)⁷; henceforth, an increase in the number of teachers needed to welcome the growing number of students will further constrain the remaining budget for other activities. Teacher cost was then identified as a stumbling block towards UPE and the designing of adequate teacher policy was said to be crucial to the success of education policies.

⁵ In 1975, primary teacher salaries represented 11.5 units of GDP per capita in francophone African countries and 5.4 units of GDP per capita in Anglophones African countries as compare to 3.5 units of GDP per capita considered as reference. (Pôle de Dakar, 2009).

⁶ This figure corresponds to nearly 42% of the total school-age population.

⁷ Nowadays, teachers' salary represents on average 70% of the current public expenditure on primary education (Pôle de Dakar 2009).

The idea that education system in Africa is suffering from teacher over cost and that this will undermine school participation was already mentioned before the years 1960 (UNESCO (1960), pp. 557-561). In the late 1980s, as the World Bank was getting more and more involved in the financing of education in developing countries, it published a report “*Education in sub-Saharan Africa: Policies for Adjustment, Revitalization and Expansion*” saying that teachers salaries is a major topic of inquiry in the quest for reducing the cost of education (World Bank 1988). Since then, various studies have been published on the issue (Zymelman and DeStefano 1989, Orivel 1991, Mingat and Suchaut 2000, Mingat 2004). Using different techniques (projections of the number of teachers needed, comparison of the growth rate of teacher payroll (higher) to the growth rate of governments’ budgets (lower), models comparing primary completion rate to teacher salaries and public resources for education), they concluded that sub-Saharan African countries will not achieve UPE unless they make a reform of their teacher recruitment policies. Mingat argued that given the high demand for education, if a clear reform is not adopted, the education system will adjust automatically at the expense of the poor (Mingat 2004, p. 20). There are limitations in the methodology used by previous studies. Their conclusions are general statement on sub-Sahara Africa, giving the impression that countries are homogeneous and henceforth, neglecting that they are subject to different realities: ability of governments to mobilize resources⁸, fiscal policies, level of budgetary constraint, level of teacher salaries and type of education issues. Nevertheless, the evolution of the education system in sub-Saharan Africa during the last 20 years tends to corroborate the predictions.

From independence until 1980, teacher policies were implemented in Africa without major difficulties. During the years 1980s, a deep economic crisis heavily constrained government budgets (they were in deficit) and reduced their ability to provide public services. As a consequence, the number of teachers recruited as civil servants was restrained, classes were not built and some schools were closed. Some governments started a reform of their teacher policy, but this was more on aspects related to teacher training (reduction of the duration of the initial training, increase in the level of qualification required, PASEC 2005a) and did not resulted in a significant reduction of the teacher cost. The World Bank and the International Monetary Fund came to rescue fiscal balance using Structural Adjustment Program (SAP); the core element of this program was a reduction of the public expenditures. This further reduced government ability to provide public services in a context of growing demand for education. Therefore communities started building their own schools before asking for a teacher. If the government cannot allocate a teacher, they hired one. Teachers hired by the communities do not always have a pedagogical training, are less paid than other teachers, or sometimes are paid in non monetary means. The result of communities’ activities was a significant increase in enrolment rates. However, this success was rapidly overshadowed by further preoccupations: pupil-teacher ratios and

⁸ Education resources depend on the country’s level of income, the fiscal policy and the priority the government gives to education.

class size rose significantly, sometimes reaching national averages greater than 60 (e.g. Central African Republic and Mali, World Bank 2008), scarcity of teachers was particularly acute in some rural or remote areas where teachers do not want to be posted (Duthilleul 2005, p. 41), some children are still refused entry into the education system because of the lack of teachers. An alternative policy, the double shift class⁹, was then adopted to make a better use of the existing teaching staff (Bianchini 2004, p. 186). This resulted in additional workload for teachers while pupils in double shift were receiving significantly less effective teaching hours; the policy was deemed unpopular. In the early 1990s, the budgetary constraints in Francophone African countries were so acute that governments decided to cut civil servant salaries, albeit massive protests.

During the years 1990s, the growing literature on the necessity to reform teacher recruitment policy started focusing public attention. The debate became more salient in 1995 when the Senegalese government adopted a new teacher recruitment scheme. It decided to hire teachers on contract of limited duration, to reduce the level of education required for entering the teaching profession (10 years of education instead of 13 years) and to pay less salary (almost half of the salary received by civil servants). Moreover, the pedagogical training was considerably reduced: from one year to 3 months (Ndoye 2001). The main advantage foreseen in the new policy was the possibility to hire twice or thrice the number of teachers with the same amount of resources. Indeed, in the year of the adoption of the reform, instead of about 500 teachers the government used to recruit as civil servants, 1200 teachers were hired on contract term¹⁰. Nowadays, the government recruits more than 2000 contract teachers per year. Senegal is often said to be the first country that adopted the reform. As the Francophone African countries were confronted with the same problem (need of teachers in a context of lack of financial resources), most of them successively adopted the contract teacher policy as well.

Nowadays, the composition of the teaching staff in Francophone African countries is different from what was observed before the 1980s. Even though they are doing the same work, teachers are no more mostly civil servants¹¹, but can have different status (state contract teachers or community teachers) associated with different contract conditions. This is a reflection of the fact that various actors are now involved in teachers' recruitment: government, communities and sometimes specific international support from donors (especially the World Bank) or NGOs. Teachers hired by communities have no initial training, various level of qualification and are less paid. Teachers hired by government can be civil servants or contract teachers; their profile varies according to countries. However contract teacher conditions are less favorable than civil servant conditions: lower salaries, short term contract and less

⁹ It is a situation in which a teacher holds two pedagogical groups, the first group in the morning, the second in the afternoon, and both groups switch the time of class attendance every week.

¹⁰ Source: Ministerial decree N° 05558 signed on June 15th, 1995 by the Ministry of Education - Senegal. www.education.gouv.sn/textes/index.php?type=arrêté, accessed on 29/12/2008.

¹¹ Interviews realized during this research revealed that recruitment as civil servant was the visible teacher recruitment policy. While this was the only way to access the teaching staff in some countries (Guinea, Senegal and Chad), other countries have simultaneously recruited teachers as civil servants and on contract terms (Cameroon and Madagascar).

secure job position. Opponents to the reform viewed contract teachers' working conditions as precarious (Welmond 2002) and predicted a reduction of the quality of education. However, many sub-Saharan African governments, especially in Francophone countries, adopted the policy.

The adoption of the contract teacher policy by governments deserves specific attention. Its objective is to hire more teachers without increasing the teacher payroll (hence reducing the teacher cost). This can only be achieved through the implementation of decisions at odds with the sacred view of the teacher as it were built in the past. Factors related to teacher cost are: the level of salary, the possibility to increase the salary via seniority and/or additional training, advantages stated in the particular statute of civil servants teachers and pensions. The formulation of the contract teacher policy aims at eliminating these factors: hiring teachers at lower qualification and reducing the duration of their initial training allow governments to pay lower salaries; hiring on contract term prevent contract teachers from increasing their salaries via additional training and from getting advantages of the teachers particular statute as these are possible only for civil servants; moreover contract teachers are paid nine months a year and cannot ask for pension when they are retired.

Given the growing number of contract teachers and the losses in the advantages former teachers used to receive, civil servant teachers unions viewed the implementation of the new teacher recruitment policy as a progressive extinction of their profession and unions¹². In some countries government's authorities expressed their opposition to the contract teacher policy so that by 2007 (the most recent year for which data used in this study are available), not all the countries in Francophone Africa have adopted it.

Countries that have already adopted the contract teacher policy formulated it differently according to the factors related to teacher cost (level of salary, duration of the contract, possibility to obtain a better position after some years of experience). Some governments decided to delegate the recruitment of contract teachers to communities, but are still the ones who finance. These differences in the formulation of the policy and the existence of other types of teachers in the education system may create confusion. To avoid this, I decide to consider as contract teacher policy in this study, any policy officially or at least formally adopted by a government after 1990 in order to recruit and/or pay teachers on a status different from the civil servant status. Henceforth, the emphasis is on the fact of reforming the existing teacher recruitment policy after the commitment to achieve UPE. Table 1 presents the year of the contract teacher policy adoption in Francophone African countries up to 2007, period covered by this study.

¹² As the majority of contract teachers have not received a professional training, civil servant teachers did not want to consider them as real teachers.

Table 1: Adoption of the contract teacher policy in Francophone African countries¹³

Year of adoption	Countries	Name of the contract teachers
1995	Senegal	Volunteers
1996	Togo	Assistant teachers
1997	Benin	Contract teachers
1997	Congo, Republic	Volunteers
1998	Guinea	Contract teachers (FIMG) ¹⁴
1998	Mali	Community teachers
1998	Niger	Contract teachers
2001	Chad	Community teachers
2002	Burkina Faso	Contract teachers
2003	Cameroon	Temporary teachers
2003	Madagascar	Parents' association teachers (FRAM) ¹⁵
2007	Central African Republic (CAR)	Contract teachers
Not adopted	Côte d'Ivoire* ¹⁶	-
Not adopted	Gabon*	-

*: countries that have not adopted the contract teacher policy by 2007

The reform of the teacher recruitment policy was said to be an unavoidable path towards UPE. Taken this as given, one can wonder why some governments have not adopted it 17 years after committing themselves to achieve UPE. Does the fact that countries adopted the reform at different point in time (up to twelve years lag) suggest that there exist a favorable context a country should reach before it government can make the reform? The next session investigate this question by summing up different theories that aim at explaining policy reforms and proposing a model of the contract teacher policy adoption.

¹³ The years of the adoption of the contract teacher policy were reconstructed using interviews of education actors and various documents.

¹⁴ FIMG stands for “Formation Initiale des Maîtres de Guinée”.

¹⁵ FRAM stands for “Fikambanan’ny Ray Amandrenin’ny Mpianatra”.

¹⁶ The civil war that started in 2002 created a separation of the territory in two zones (North and South). Since then, many schools in the North (the rebel zone) hire teachers paid by the community or by NGOs. After the end on the conflict (in 2007), negotiations in order to integrate these teachers into the civil servants status started.

3. Determinants of policy reforms

Governments' decision to adopt a new policy has attracted scholars' attention since the mid 1900s. According to Berry and Berry (2007), the extensive numbers of studies in this area reveal two principal forms of explanation: internal determinants and diffusion models. Internal determinants models presume that the factors causing a government to adopt a reform are political, economic and social characteristics of the country. Diffusion models consider policy adoption as a consequence of governments' interdependency. In a contribution to the book "*Theories of the Policy Process*" edited by Sabatier (2007), Berry and Berry (2007) present a unified model of government innovation reflecting both internal determinants and diffusion. The model identifies the following elements as key internal determinants of policy reform: the *motivation* of the government to adopt a new policy, the availability of *resources* to implement the policy, the existence of *obstacles* to the policy, the existence of *other policies* that can facilitate or render difficult the adoption of the new one. The model also identifies *learning*, *competition* and *coercion* as a diffusion pattern through which a reform may occur.

The setting offered by the model is particularly relevant for the research question. The purpose is to identify what context is favorable to the adoption of the contract teacher policy. This context can be defined as the situation to which a government is confronted with when adopting a reform. Therefore, the determinants of policy adoption listed by Berry and Berry help identifying key variables to describe the context. The underlying idea behind this approach to the research question is, taking for granted that a reform of the teacher recruitment policy is a prerequisite to the achievement of UPE, governments that were able to adopt a reform witnessed a favorable context while those who have not adopted a reform have not witnessed the same context. Moreover, among those who have adopted the reform, early adopters are those who were the first to witness the favorable context and late adopters are those who witnessed the favorable context recently.

There is no clear cut between the determinants of policy adoption listed by Berry and Berry; however, they provided a loose definition.

Motivation refers to variables related to public officials' interest in adopting the policy. Two variables are identified here: the severity of the issue and the electoral competition. In relation with the research question, the severity of the issue is the number of teachers needed; this figure varies from one country to another and can be assessed through different consequences (high class size or low enrolment rate). Depending on how acute the teacher shortage is, a government may react by adopting the contract teacher policy. A government is also motivated by the desire to stay in power. In a context of electoral competition, it will rather adopt reforms that create immediate visible benefits. Even though opponents to the contract teacher policy believe that it will lead to a decrease of the quality of education, this can only be observed in the long run whereas the positive effect associated with that policy are straight

forward: more children will have the possibility to enroll to school, the burden of parents who live in remote areas and who have to hire teachers on their limited resources will be reduced, unemployed graduated students will have the possibility to find a job, the teachers' workload will be reduced. Given the immediate benefits associated with the contract teacher policy, one can expect a government to adopt the reform in a period close to elections. However, such an expectation will hold only if the electoral process is fair.

A situation that can prevent a government from adopting a reform is the lack of *resources* to implement it. In the specific case of the contract teacher policy, the implementation of the reform will actually save resources. Given that education budgets in countries under investigations are very limited, the lack of resources cannot be used to identify a favorable context (it does not differentiate between adopters and non adopters).

Obstacles refer to anything that can block the adoption of the reform. Civil servant teachers unions are the major actors opposed to the contract teacher policy; they see it as an attempt to progressively suppress their corps. In sub-Saharan Africa, teachers unions are considered differently from other unions because some of them had caused the collapse of governments (Bianchini 2004, Chabi (2008)). However, they are not equally active: while being influential in some countries, they are almost invisible in others. One can expect a government that faces a non influential (weak) teacher union to adopt the contract teacher policy.

Other policies indicate the presence or absence of a policy that can facilitate or render difficult the adoption of a new policy. In sub-Saharan Africa, the recruitment of teachers by communities, donors or NGOs is not a clearly define policy, but this category of teachers is present everywhere at different proportion. In some countries, the share of non civil servant teachers can be high so as to legitimate government's decision to recruit teachers under the same contract conditions like other actors do. For this reason, one can expect a government to adopt the contract teacher policy if the share of non civil servant teachers in the education system is high.

Besides the internal determinants, it is believed that a context of policy diffusion may also lead to the adoption of a reform. The recent years have witnessed a growing literature on policy diffusion which defines diffusion as a process where the choice of a government influences the choices made by others and, conversely, the choice of a government is influenced by the choices made by others (Braun and Gilardi 2006, p. 299). This literature suggests that a better understanding of policy diffusion is provided by examining the mechanism that facilitates the diffusion of the policy. It is admitted that diffusion comes through three patterns: social construction, learning and competition (Simmons and Elkins 2004; Braun and Gilardi 2006; Dobbin, Simmons and Garrett 2007). The recent works on

diffusion provide more information on the understanding of the diffusion mechanisms than the original model developed by Berry and Berry does. Therefore, the diffusion aspect of the model will be examined using recent results.

Social construction and learning mechanisms are certainly at action in fostering the adoption of the teacher policy reform. International organizations like the World Bank, the Association for the Development of Education in Africa (ADEA) and the UNESCO organize international conferences involving government's authorities, members of teachers unions and parents-teachers associations to discuss the pro and cons of the contract teacher policy; the experience of early adopters is generally presented in these meetings. On the other hand, education experts working with ministries of education (generally the same panel of experts work in all the countries) also provide advices regarding the policy. However, given that the benefits associated with the policy are mixed, it is not clear what is actually learned: a country that adopts the policy may learn from early adopters that it increases the participation to education, while another may not adopt the policy because of the threat of a detrimental effect on education quality. As the amount of information spread in the countries is the same, I make the assumption that countries share the same context concerning learning and social construction about the reform¹⁷; henceforth, this aspect cannot help understanding why some adopt the reform and others not. Concerning diffusion through competition, there is no reason to believe that this mechanism is at action here, especially given that the focus is on primary education and teachers' mobility at this level is nonexistent.

Another factor that can affect the adoption of a new teachers' recruitment scheme is pressure by donors. Donors, especially the World Bank, are known for being in favor of the contract teacher policy and for contributing to the financing of its implementation in some countries. Given that the contract teacher policy is presented as necessary to the achievement of UPE, they impose its adoption as conditionality to access international aid. Therefore, one can expect a country which is dependent on external aid to adopt the contract teacher policy.

There is a debate in the literature whether pressure from donors (coercion) can be considered as a diffusion process. Strictly speaking, it is not "diffusion" in the sense that the action taken by a government directly influences the behavior of another. Whatsoever, it is not the aim of this study to solve this debate; the key point here is to put an emphasis on the role of donors in triggering the adoption of the contract teacher policy.

¹⁷ However, it will be useful to carry out a study on this aspect.

The following equation summarizes the determinants identified as related to a government's decision to adopt the contract teacher policy.

$$\text{Adoption} = f(\text{Severe teacher shortage, Closeness to fair electoral competition, Strong (weak) teachers unions, Existence of considerable number of non civil servant teachers, Dependence on external aid})$$

These determinants can be used to grasp the context under which the adoption of the reform occurred. They are not exhaustive and the list can be complemented given additional knowledge on the reality of sub-Saharan African countries, especially regarding the management of public issues.

The next section presents the data and the method used to analyze the context prevailing in the countries when the policy was adopted, as well as the context prevailing in countries that have not adopted the policy.

4. Data and method

Data

The strategy conducted here is the most similar system design (MSSD). It consists in comparing very similar cases which differ in the dependent variable, under the assumption that this would make it easier to find those independent variables which are associated with the presence/absence of the dependent variable. The principle of the MSSD provides a criterion for the selection of cases to consider: they must be different with respect to the independent variables and as similar as possible with respect to variables not taken into account. For this reason, the analysis was focused on the Francophone African countries that were former colonies of France. Apart from being in the region of the world where the need for teachers is the greatest, they share many similarities. They are fully centralized states, have the highest average teacher salaries (expressed in terms of units of GDP per capita) around the world, have the same structure of the education system (drawn from the French model) and most of the time, use the same curricula regarding the fundamental learning. However due to the lack of information, Mauritania is not covered. Consequently 14 out of 15 countries are included in the analysis.

Adoption: The adoption of the contract teacher policy is represented by a dummy variable that takes the value 1 if a reform of the teachers' recruitment policy was adopted and 0 if not. There is no information system on policy making in Francophone African countries; for that reason, information

on the reform was collected using various sources. Official documents allowing the hiring of teachers on short term contract and newspaper articles were used to reconstruct the years of the adoption of the reform. A questionnaire was designed in order to collect information on the evolution of the teacher policy. Additionally, expert interviews were carry out with World Bank's education specialists, authorities of the ministry of education and representative of teacher unions in order to grasp the context prevailing in the countries when the reform was adopted.

Severity of the teacher shortage: An obvious indicator to measure the severity of the teacher shortage is the number of teacher needed in the education system. Unfortunately, countries don't estimate this figure. Moreover, despite the salience of the teacher shortage in developing countries and the fact that several projects or reforms have been implemented to solve the issue, an adequate indicator to measure the intensity of the lack of teachers in line with the objective of UPE does not exist. The only element people refer to is the pupil-teacher ratio (PTR): the higher the pupil-teacher ratio, the more the need for teachers. This way of assessing the teacher shortage is limited; it tells about the number of teachers required to provide good teaching conditions to children already enrolled in school, but it says nothing concerning the children out of school.

Given that the lack of teachers will turn into a high pupil-teacher ratio and a high number of children out of school (and consequently a low value of the gross enrolment rate), I constructed an indicator of the severity of the teacher shortage in line with the objective of UPE by taking the ratio of the pupil-teacher ratio to the gross enrolment rate.

$$\textit{Severity_of_the_teacher_shortage} = \frac{\textit{Pupil_Teacher_Ratio}}{\textit{Gross_Enrolment_Rate}} = \frac{\textit{School_aged_population}}{\textit{Number_of_teachers}}$$

This indicator is meaningful because it tells us how many pupils a teacher in the education system would have to accommodate with, if all the children were enrolled to school under the current teacher recruitment policy. Therefore, the higher is the indicator, the more acute is the teacher shortage.

The severity of the teacher shortage was calculated using data provided by the UNESCO and the World Development Indicators 2008. To fill in some missing values, Country Status Reports and the books series¹⁸ Dakar + 5, Dakar + 6 and Dakar + 7 were used when available; considerable data on the education system can be found in these documents. When the value of the indicator was not available for the year of the adoption of the reform, the missing value was imputed using the most recent data available before that year.

¹⁸ These books series are jointly published by the UNESCO-Breda and the Pôle de Dakar. <http://www.poledakar.org/spip.php?rubrique63> , accessed on 06/03/2009.

It is admitted that a pupil-teacher ratio close to 40 is the reference developing countries should have¹⁹. The sample of Francophone African countries considered here show a severity of the teacher shortage ranging from 31 (in Gabon) to 168 (in Mali). It means that if all the children with the corresponding age were enrolled to school under the traditional teacher recruitment policy, a teacher in primary education in Gabon would have had to accommodate 31 pupils on average, while his colleague in Mali would have to deal with 168 pupils. This indicator reveals how acute can be the teacher shortage in some countries.

Closeness to fair elections: The aim of this variable is to capture a sanction mechanism. The idea is that in a country where elections are fair, the government ought to react to severe public issue especially when there are elections at sight, otherwise the president and/or the government will be overthrown. Since 1990, Francophone African countries have witnessed a substantial improvement of the level of democracy; however, it is still unclear if elections constitute a sanction mechanism in many of these countries. This doubt is enhanced by the frequency of protests and testimonies of fraud observed when elections are organized²⁰. Therefore, closeness to fair elections is constructed by combining two facts: the country is an electoral democracy in the sense defined by the African Election Database²¹ (Electoral Democracy: Nations with governments elected through generally legitimate, free, and fair elections that reflect the will of the people, a freely operating political opposition, and a climate that encourages respect of both political rights and civil liberties.) and the adoption of the reform occurred in a year closer to the next presidential elections than to the last presidential elections. The result is a dummy variable that takes the value 1 if both conditions are met and 0 otherwise. This variable was constructed using data from the African Election Database²².

Strength of teachers' unions: A good indicator of unions' strength is the number of claims that had a successful outcome divided by the total number of claim they make in a given time period. Unfortunately, the information needed to compute that indicator is not available in many of the countries included in this study. Another approach frequently used to apprehend unions' strength is to refer to proxies like the number of unions, the number of teachers members of a union and the number of strikes that led to successful outcome for the unions. Interviews were made with representatives of teachers unions in order to collect such information. Unfortunately, it was not possible to retrieve

¹⁹ See Education For All Fast-Track-Initiative, www.education-fast-track.org/, accessed on 10/03/2009.

²⁰ A summary of presidential elections in Africa since 1990 and the protests that followed can be found on: <http://africawatch.ivoire-blog.com/archive/2008/04/24/elections-presidentielles-en-afrique.html>, accessed on 13/03/2009. A detailed investigation on democracy and elections in Africa from 1989 to 2003 can be found in Lindberg (2006). Also see Milonas and Roussias (2008).

²¹ Terms and definitions concerning the level of democracy as presented by African Election Database are provided in appendix 4.

²² see <http://africanelections.tripod.com> accessed on 02/11/2009.

reliable information because the contract teacher policy was adopted more than ten years ago and the interviewees could not remember the figures.

To overcome the lack of information on unions' strength, this study has resorted to experts interviews. As said previously, the same panel of experts (consultants, World Bank agents, representatives of the French Development Agency) works with authorities of the ministry of education in Francophone African countries. Ten experts chosen for their availability were asked to say if the teachers unions were perceived as influential by the government in each country included in the sample. They all agree on countries where the teachers unions are perceived as influential (Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Mali, Niger, Senegal) and countries where they can be considered as rather weak (Central African Republic, Chad, Guinea, Madagascar, Togo). They couldn't agree whether the teachers unions in the remaining countries can be considered as influential or weak (Congo, Gabon). Given that teachers' unions in these countries are not often on strike, I make the assumption that it is because they manage to prevent issues with the government before it occurs and hence classify these unions on the category of influential. This measure of teachers unions' strength is subjective and calls for a study to properly assess unions' activities.

Share of already existing non civil servant teachers: Even though it is widely believed that the government is responsible for the provision of basic education and therefore is the institution that should recruit teachers, some communities confronted with teacher shortage decided to recruit teachers well before the commitment to achieve UPE. It is the case in Central African Republic, Chad and Madagascar where the communities had to react to the incapacity of the government to fulfill its task. In parallel to the recruitment of teachers as civil servants, some governments have developed a policy to recruit teachers on contract terms well before the years 1990; this is the case for instance in Madagascar and Cameroon.

Because of the lack of data, it is not possible to include the share of these non civil servant teachers in the analysis. However, one can believe that countries that already had a parallel teacher recruitment policy (either by the government or by the communities) before the commitment to achieve UPE have the largest share of non civil servant teacher. The variable is therefore approximate by a dummy that take the value 1 for the existence of an alternative teacher recruitment policy before the year 1990 and 0 otherwise.

Dependence on external aid: This variable is measured by taking the ratio of the total official aid received by a country to the Gross National Income. Given that aid received by a country can fluctuate from one year to the next, instead of taking the indicator on one year, the mean value of the indicator over the period 1990 (year of the commitment to UPE) to 2006 (latest available data) is chosen to measure aid dependency: a higher value indicates a higher dependence on aid. This variable was computed using data from the World Development Indicators 2008.

Finally, five determinants identified as related to the adoption of the teacher recruitment policy will be empirically examined on 14 countries. The followings paragraphs discuss the method that will be used.

Method

The number of countries included in this study is rather small; therefore, the method used to carry out an empirical analysis of the adoption of the reform should be able to deal with small samples. The recent years have witnessed the development of a method which aims at fulfilling this task: it is the crisp-set Qualitative Comparative Analysis (csQCA). csQCA combines qualitative and quantitative approaches to enable the test of hypotheses based on small sample. It uses Boolean algebra to identify if the presence or the absence of a given condition is necessary or sufficient for the occurrence of a given phenomenon. Moreover, it detects which associations of conditions (configurations) lead to the occurrence of the given phenomenon. Five objectives can be assigned to csQCA (Ragin and Rihoux 2009, p. 15). In this study, csQCA is used to quick test conjectures and to summarize data (data reduction). For more exposition on Boolean algebra and csQCA, see Ragin (1987), Wickham-Crowley (1992), Berg-Schlosser and Cronqvist (2005), Schneider and Wagemann (2007), Rohwer (2008), Ragin and Rihoux (2009), Bol (2009).

The terminology of csQCA (which is different from the terminology of quantitative methods) will be used from now on. The words “outcome” and “conditions” will be used instead of dependent and independent variables (see table 2).

Table 2: Variable labels

Variables	Status	Names
Contract teacher policy adoption	Outcome	adoption
Severe teacher shortage	Condition	severe-shortage
Closeness to fair presidential elections	Condition	fair-elections
Weak teachers unions	Condition	weak-unions
Existence of an alternative teacher recruitment policy before 1990	Condition	alternative-policy
Dependence on external aid	Condition	aid-dependence

An important requirement in the use of csQCA is that there must be enough variance in the outcome. Unfortunately, the data at hand don't comply with this constraint: 12 out of 14 countries have adopted the reform by 2007. In order to overcome this limitation, the analysis was oriented towards the

comparison of the context under which the first governments adopted the reform (leaders) to the context prevailing in the remaining countries (laggards). This is equivalent to running the analysis in a year prior to 2007. The year 2000 was chosen because, a part from corresponding to a point that creates variance in the outcome, it is the first moment when countries around the world met after the commitment to achieve UPE to discuss what policies to implement in order to reach the target. This methodological trade-off does not affect the research question; indeed, if leaders adopted the reform under the same context, it is still possible to compare that context to the one prevailing in the remaining countries when they adopted the reform. Conversely, if leaders adopted the reform under various contexts, this will mean that there is no pre-identified favorable context for the reform to occur.

In order to take into account the time dimension, data are collected on a country relatively to the year its government adopted the reform. For the countries that have not adopted the new policy by 2000, data are collected relatively to the year 2000. Even though the context variables are measured at a different period, the important point is that at the end, only the contexts under which the reform occurred are compared. Appendix 3 provides data at different periods in time hence enabling to track how countries' contexts change over time.

With csQCA technique, conditions must be defined as present or absent. It implies that quantitative variables shall be transformed into dummies. This process induces a slight change in the meaning of the variables: instead of giving the degree on a scale, a threshold is chosen so as being above or under it indicates the presence or absence of the condition. Many rules are available to choose a relevant threshold²³; in this study, the threshold was chosen on an area of a high jump between two observed values²⁴.

The severity of the teacher shortage for instance indicates on average how many pupils a teacher will have to accommodate with if all the children were registered to school with the current number of teachers. The Education for All - Fast-track Initiative (FTI) which is a global partnership between donors and developing countries to ensure accelerated progress towards UPE recommends a pupil-teacher ratio of 40 as a reference. In Africa, the average value for this indicator is 60 to 70 and is already viewed as high. Any value above 70 can be taken as the threshold. Available data on the severity of the teacher shortage shows that 80 corresponds to an area where there is a high jump among observed values: therefore, 80 was chosen as the threshold for this variable. Countries whose value is above 80 are considered as having a severe teacher shortage.

²³ see Ragin and Rihoux (2009), p. 148.

²⁴ In the absence of a theoretical motivation, the choice of the threshold remains subjective.

By analogy, the threshold for the dependence on external aid was set at 11%, meaning that if a country has a ratio of total aid to Gross National Income greater than 11%, it is considered here as being aid dependent.

5. Analysis and results

The construction of the condition “closeness to fair elections” produces an indicator which is almost constant among cases (Apart from Madagascar, the value for that condition is zero). This condition results from the combination of two others: being an electoral democracy and adopting the reform in a period close to the next presidential elections. It happens that by the year 2000, 4 out of the 14 countries organize fair elections; two of these countries have adopted the reform, but none of them did it in a period close to an electoral competition. The dataset reveals that the two other electoral democracies adopted the reform later, but not in a period close to elections. The remaining countries that adopted the reform are not electoral democracies: it can therefore be concluded that in practice, the context of elections is not related to the adoption of the contract teacher policy. This result corroborates the findings of the interviews during which education actors said political parties do not include the teachers’ recruitment policy per se in their electoral program, but rather promise the improvement of the education system in general. As csQCA does not allow for a condition that does not vary among observations, the condition “closeness to fair elections” was excluded from the csQCA data reduction process.

csQCA requires the construction of the truth table in the preliminary steps of the analysis. It is a table that shows combinations of conditions that have been observed, their corresponding outcome and the observations associated with each. It is obtained from the original dataset (raw data) by transforming quantitative variables into dummies and by putting together observations that have the same values relatively to the set of conditions under investigation. Table 3 shows the truth table associated with the data. The raw data is available in appendix 1.

There is a contradiction in the truth table, meaning there is a situation where two countries share the same context, but one has adopted the policy while the other has not. Countries involved are Burkina Faso and Mali. Given that Burkina Faso adopted the policy in 2002 while witnessing the same context (see appendix 2), I decide to assign the contradiction to the category of positive cases.

Table 3: Truth table associated with the dataset

Country (Country code)	Severe shortage	Weak unions	Alternative policy	Aid dependence	Adoption
Benin (BN)	0	0	0	1	1
Congo (CG)	0	0	1	1	1
Guinea (GN)	1	1	0	0	1
Niger (NG), Senegal (SN)	1	0	0	1	1
Togo (TG)	0	1	1	0	1
Burkina Faso (BF), Mali (ML)	1	0	1	1	C
Central African Republic (CA), Chad (CH)	1	1	1	1	0
Cameroon (CM)	0	0	1	0	0
Madagascar (MD)	0	1	1	1	0
Cote d'Ivoire (CI), Gabon (GB)	0	0	0	0	0

The truth table is useful in carrying out some preliminary analyses: it helps performing quick test of theories and it also helps identifying if a condition can be excluded as sufficient or necessary for the occurrence of the outcome.

In this study, the conditions identified as related to the adoption of the contract teacher policy were derived from existing theories. It has already been shown that the theory that suggests, a government decision to adopt the reform is mediated by the threat of electoral competition, does not hold in the countries under investigation. The truth table provides information on the remaining theories. When the conditions are simultaneously absent the reform does not occur; this is the case in Cote d'Ivoire and Gabon where the reform has never been adopted. But when one of the conditions is present, the occurrence of the reform is not automatic: the context of Central African Republic and Chad is a good illustration for the later finding. The conditions are simultaneously present in both countries; one would have expected them to be leaders in the adoption of the reform, but it was not the case. Moreover, Central African Republic is the last country that adopted the reform. This result means that there is not a direct link between the presence of a condition and the occurrence of the reform: put differently, none of the conditions is independently sufficient to trigger the reform. But, are these conditions necessary for the reform to occur? A condition is necessary if it must be present otherwise the outcome will not occur. Therefore, for adoption = 1, a condition that takes the value 0 in at least

The context in Central African Republic and Chad is set by the existence of alternative teacher recruitment policy and the dependence on external aid. These countries have witnessed several civil wars that led to the weakening of the state. Communities have subsequently decided to build schools and hire teachers, hence creating inequities in the education system (government schools vs. communities' schools). In the recent years, the desire to move towards equity in the education system forced education actors to find a way to integrate community teachers on the government payroll, hence making the reform.

The context in Cameroon and Madagascar corresponds to the absence of a severe teacher shortage and the existence of an alternative teacher recruitment policy. Even before the commitment to achieve UPE, these countries were already hiring a considerable number of teachers as non civil servant. In Madagascar the role of communities in hiring teacher was determinant and forced the government to react. The reform in Madagascar for instance only consisted in integrating community teachers on the government payroll and to require minimum conditions for the recruitment and training of teachers by the communities. In Cameroon, it was the government who decided in the past to recruit teachers as non civil servants either directly or on the budget of the commune; here, the reform consisted in collapsing the alternative recruitment schemes into one harmonized policy implemented by the government.

Summing up, Francophone African countries have adopted the contract teacher policy under various contexts. Moreover, countries that share the same context adopted the policy at different periods in time. For instance, Senegal and Burkina Faso are dependent on external aid and have strong teachers unions; but the former adopted the reform in 1995 while the later did it in 2002²⁷; this difference in the period of the adoption can also be observed with Central African Republic and Chad²⁸. These results points out the limitations of identified existing theories to account for the adoption of the contract teacher policy. Alternative theory is therefore needed. This theory must go beyond the description of the context to take into account the time lag in the explanation of governments move towards the new policy. An investigation is also needed in order to understand how education actors manage to make the reform given the context they are facing. This analysis made the assumption that potential of learning from best practice is constant among countries; it might be useful to relax this assumption and to check whether bounded rationality (see Meseguer 2006) is playing a role here (this suppose to carry out an in-depth investigation of cases that share the same context.

²⁷ In 1995, both countries already share the same context.

²⁸ In 2001, both countries already share the same context. Chad adopted the reform in 2001 and Central African Republic adopted it in 2007.

Results for adoption = 0 without including logical remainders: context for laggards

Data show countries that have not adopted the reform by 2000 can be separated into two distinct contexts. However some of them subsequently made the move. At this moment, only Cote d'Ivoire and Gabon have not adopted the contract teacher policy (and are not planning to adopt it); they are characterized by the fact that none of the conditions identified as related to the adoption of a reform is present.

6. Conclusion

International commitment to achieve UPE induces major changes in the education system in sub-Saharan African countries. Teachers' recruitment policy is among the salient debates. Several studies concluded that the traditional teachers' recruitment policy is a stumbling block to the achievement of UPE and recommended the adoption of new recruitment schemes. Unfortunately, the alternative recruitment policy proposed, namely the contract teacher policy (lower salaries, less secure contract and lower qualification required as compared to the traditional policy), is contested. Opponents to this new policy said that new teachers' working conditions are precarious and predicted a decrease of the quality of education. However many African countries have adopted the contract teacher policy but others have not. While the impact of this reform on education quantity and quality is largely analyzed, less attention is paid to the political process behind the reform. The aim of this paper was to complement the knowledge by investigating if there is a favorable context for the adoption of the contract teacher policy.

Using a model of innovation and diffusion developed by Berry and Berry, a set of conditions that can trigger the adoption of the reform was identified. A sample of Francophone African countries was selected to empirically examine a link between the conditions identified and the adoption of the reform. The choice of these countries was motivated by the similarities they share regarding education issues. The conditions included in this study are the severity of the teacher shortage, the closeness to fair presidential elections, the existence of strong or influential teachers unions, the share of already existing non civil servant teachers and the dependence on external aid.

Investigations were made using csQCA. It was shown that none of the conditions is independently necessary or sufficient for the adoption of the reform. The analysis of the situation prevailing in the countries when the reform was adopted shows there is not a unique context leading to the reform, but

contract teacher policy was adopted under distinct contexts. In addition, countries can share the same context, but adopt the reform at different periods; hence meaning that there is not a direct causal link between the context and the adoption of the reform. These results point out the limitations of identified existing theories to account for the adoption of the contract teacher policy. Alternative theory taking into account the time lag in the explanation of governments move towards the new policy is therefore needed. An investigation is also needed in order to understand how education actors manage to make the reform given the context they are facing. While providing insights in the adoption of the contract teacher policy, this study highlights areas for future investigations. The study also highlighted the necessity to set up an information system in order to overcome the lack of data on the policy making in developing countries.

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Appendix 1: Raw data corresponding to the situation in 2000

countries	code	year reform	severity	electoral democracy	Year of presidential elections	fair elections	weak unions	alternative policy	aid dependent
Benin	BN	1997	70.44	70.44	1996-2001	Democracy	0	0	13.08
Burkina Faso	BF	2000	111.57	111.57	1998-2005	Restricted Democratic Practice	0	1	16.25
Cameroun	CM	2000	60.28	60.28	1997-2004	Restricted Democratic Practice	0	1	5.18
Central African Republic	CA	2000	108.28	108.28	1999-2005	Democracy	1	1	13.37
Chad	CH	2000	104.14	104.14	1996-2001	Restricted Democratic Practice	1	1	14.5
Congo	CG	1997	61.40	61.40	1992-2002	Transitional Period	0	1	11.03
Cote d'Ivoire	CI	2000	64.92	64.92	1995-2000	Military Regime	0	0	8.3
Gabon	GB	2000	31.89	31.89	1998-2005	Restricted Democratic Practice	0	0	2.15
Guinea	GN	1998	86.10	86.10	1998-2003	Restricted Democratic Practice	1	0	10.45
Madagascar	MD	2000	48.40	48.40	1996-2001	Democracy	1	1	12.75
Mali	ML	1998	168.43	168.43	1997-2002	Democracy	0	1	17.65
Niger	NG	1998	139.93	139.93	1996-1999	Restricted Democratic Practice	0	0	15.86
Senegal	SN	1995	90.20	90.20	1993-2000	Emerging Democracy	0	0	11.64
Togo	TG	1996	38.78	38.78	1993-1998	Restricted Democratic Practice	1	1	10.56

The variable aid dependency is the mean of aid over gross national income from the year 1990 to the year 2000.

Appendix 2: Raw data corresponding to the situation in 2007

countries	code	year_reform	severity	Electoral democracy	Year of presidential elections	Fair elections	Weak unions	Alternative policy	Aid dependence
Benin	BN	1997	70.44	Democracy	1996-2001	0	0	0	11.61
Burkina Faso	BF	2002	99.52	Emerging Democracy	1998-2005	0	0	1	15.14
Cameroon	CM	2003	55.07	Restricted Democratic Practice	1997-2004	0	0	1	5.43
Central African Republic	CA	2007	128.85	Democracy	2005 - 2010	0	1	1	11.08
Chad	CH	2001	103.96	Restricted Democratic Practice	2001-2006	0	1	1	12.67
Congo	CG	1997	61.40	Transitional Period	1992-2002	0	0	1	10.39
Cote d'Ivoire	CI	Not Adopted	56.84	Restricted Democratic Practice	2000 - 2009	0	0	0	6.36
Gabon	GB	Not Adopted	23.65	Restricted Democratic Practice	2005-2012	0	0	0	1.60
Guinea	GN	1998	86.10	Restricted Democratic Practice	1998-2003	0	1	0	9.23
Madagascar	MD	2003	44.18	Democracy	2001-2006	0	1	1	13.45
Mali	ML	1998	168.43	Democracy	1997-2002	0	0	1	16.30
Niger	NG	1998	139.93	Restricted Democratic Practice	1996-1999	0	0	0	15.43

Senegal	SN	1995	90.20	Emerging Democracy Restricted	1993-2000	0	0	0	10.71
Togo	TG	1996	38.78	Democratic Practice	1993-1998	0	1	1	8.03

The variable aid dependency is the mean of aid over gross national income from the year 1990 to the year 2007.

Appendix 3: Data showing the evolution of countries' contexts

countries	severity			electoral democracy			Year of presidential elections			weak unions		alternative policy	aid dependency		
	1995	2000	2005	1995	2000	2005	1995	2000	2005	1995	2005	before 1990	1995	2000	2005
Benin	70.89	68.07	48.95	Democracy	Democracy	Democracy	1991-1996	1996-2001	2001-2006	0	0	0	15.31	13.08	11.84
Burkina Faso	125.97	111.56	83.97	Restricted	Restricted	Emerging	1991-1998	1998-2005	2005-2010	0	0	1	17.86	16.25	15.20
Cameroon	52.94	60.29	44.26	Restricted	Restricted	Restricted	1992-1997	1997-2004	2004-2011	0	1	1	5.55	5.18	5.19
Central African Republic	NA	108.27	146.10	Democracy	Democracy	Military	1993-1999	1999-2005	2005-2010	1	1	1	15.13	13.37	11.21
Chad	122.47	104.14	83.52	Transition	Restricted	Restricted	1969-1996	1996-2001	2001-2006	1	1	1	15.79	14.50	13.12
Congo, Rep.	61.63	72.68	77.69	Democracy	Transitional	Restricted	1992-2002	1992-2002	2002-2009	0	0	1	10.18	11.03	10.39
Cote d'Ivoire	73.58	64.93	65.35	Restricted	Military	Restricted	1990-1995	1995-2000	2000-2008	0	1	0	10.53	8.30	6.66
Gabon	25.27	31.89	23.68	Restricted	Restricted	Restricted	1993-1998	1998-2005	2005-2009	0	0	0	2.96	2.15	1.67
Guinea	102.38	74.34	52.06	Restricted	Restricted	Restricted	1993-1998	1998-2003	2003-2010	1	0	0	12.36	10.45	9.50
Madagascar	40.51	48.41	38.52	Democracy	Democracy	Democracy	1992-1996	1996-2001	2001-2006	1	1	1	12.59	12.75	13.42
Mali	193.41	107.21	70.47	Democracy	Democracy	Democracy	1992-1997	1997-2002	2002-2007	0	0	1	19.11	17.65	16.39
Niger	134.80	124.12	87.87	Democracy	Democracy	Democracy	1993-1996	1996-1999	1999-2004	0	0	0	18.01	15.86	15.70
Senegal	90.50	76.06	52.28	Emerging	Emerging	Democracy	1993-2000	2000-2007	2000-2007	0	1	0	12.92	11.64	10.80
Togo	42.87	36.15	33.80	Restricted	Restricted	Restricted	1993-1998	1998-2003	2003-2005	1	0	1	13.10	10.56	8.31

Appendix 4: Terms and definitions concerning the level of democracy

Source: Nunley, A. (2004): African Election Database, available at <http://africanelections.tripod.com/index.html>, last updated on Monday, January 07, 2008 2:01:47 PM.

Democracy [Electoral Democracy]: Nations with governments elected through generally legitimate, free, and fair elections that reflect the will of the people, a freely operating political opposition, and a climate that encourages respect of both political rights and civil liberties.

Emerging Democracy: Nations with emerging democratic systems have governments that have come to power through a more legitimate democratic process than those with a restricted system, however, factors such as a dominant political party, free but unfair elections, and a weak rule of law prevent it from being a fully democratic state.

Military Regime: Governments that are set up and run by military officials. Most military regimes seize power through coup d'états and rebellion.

Restricted Democratic Practice: These are primarily regimes in which a dominant ruling party controls the levers of power, including access to the media, and the electoral process in ways that preclude a meaningful challenge to its political hegemony.

Transitional Government: Governments installed through non-democratic processes (coups, military, peace-deals, power-sharing agreements, etc.) and rule for a limited amount of time until a permanent government can come to power.

Appendix 5: Minimized formulas using Tosmana version 1.3

Using the data from the situation in 2000

Tosmana Report
Algorithm: Quine

Settings:

Minimizing Value 1
including C

Truth Table:

v1: severe_shortage v2: weak_unions
v3: alternative_policy v4: aid_dependent

O:	adoption	id:	code		
v1	v2	v3	v4	O	id
0	0	0	1	1	BN
1	0	1	1	C	BF,ML
0	0	1	0	0	CM
1	1	1	1	0	CA,CH
0	0	1	1	1	CG
0	0	0	0	0	CI,GB
1	1	0	0	1	GN
0	1	1	1	0	MD
1	0	0	1	1	NG,SN
0	1	1	0	1	TG

v1	v2	v3	v4	O	id
0	0	0	1	1	BN
1	0	1	1	1	BF,ML
0	0	1	0	0	CM
1	1	1	1	0	CA,CH
0	0	1	1	1	CG
0	0	0	0	0	CI,GB
1	1	0	0	1	GN
0	1	1	1	0	MD
1	0	0	1	1	NG,SN
0	1	1	0	1	TG

Note:

In this study, csQCA is used with an objective to describe what happened in the past (data reduction). Therefore, there is no technical requirement to include logical remainders in the minimization process.

In fact, the purpose in including logical remainders is to find more simple formulas. It is therefore useful when csQCA is employed with an aim to elaborate theories (parsimoniousness principle). Technically, including logical remainders will imply making assumptions, hence putting constraints on the results.

This study made the choice to present the unconstrained results (results without including logical remainders) and to keep the constrained results (results including logical remainders) in the appendix.

Minimizing Y=1, including C=1, excluding logical remainders

Result:

$$\begin{aligned} & \text{weak_unions}\{0\} * \text{aid_dependent}\{1\} + \\ & \quad (\text{BN}+\text{BF}, \text{ML}+\text{CG}+\text{NG}, \text{SN}) \\ & \text{severe_shortage}\{1\} * \text{weak_unions}\{1\} * \text{alternative_policy}\{0\} * \text{aid_dependent}\{0\} + \\ & \quad (\text{GN}) \\ & \text{severe_shortage}\{0\} * \text{weak_unions}\{1\} * \text{alternative_policy}\{1\} * \text{aid_dependent}\{0\} \\ & \quad (\text{TG}) \end{aligned}$$

Minimizing Y=1, including C=1, including logical remainders

$$\begin{aligned} & \text{weak_unions}\{0\}\text{aid_dependent}\{1\} \quad + \quad \text{weak_unions}\{1\}\text{aid_dependent}\{0\} \\ & \quad (\text{BN}+\text{BF}, \text{ML}+\text{CG}+\text{NG}, \text{SN}) \quad \quad \quad (\text{GN}+\text{TG}) \end{aligned}$$

Minimizing Y=0, excluding C=1, excluding logical remainders

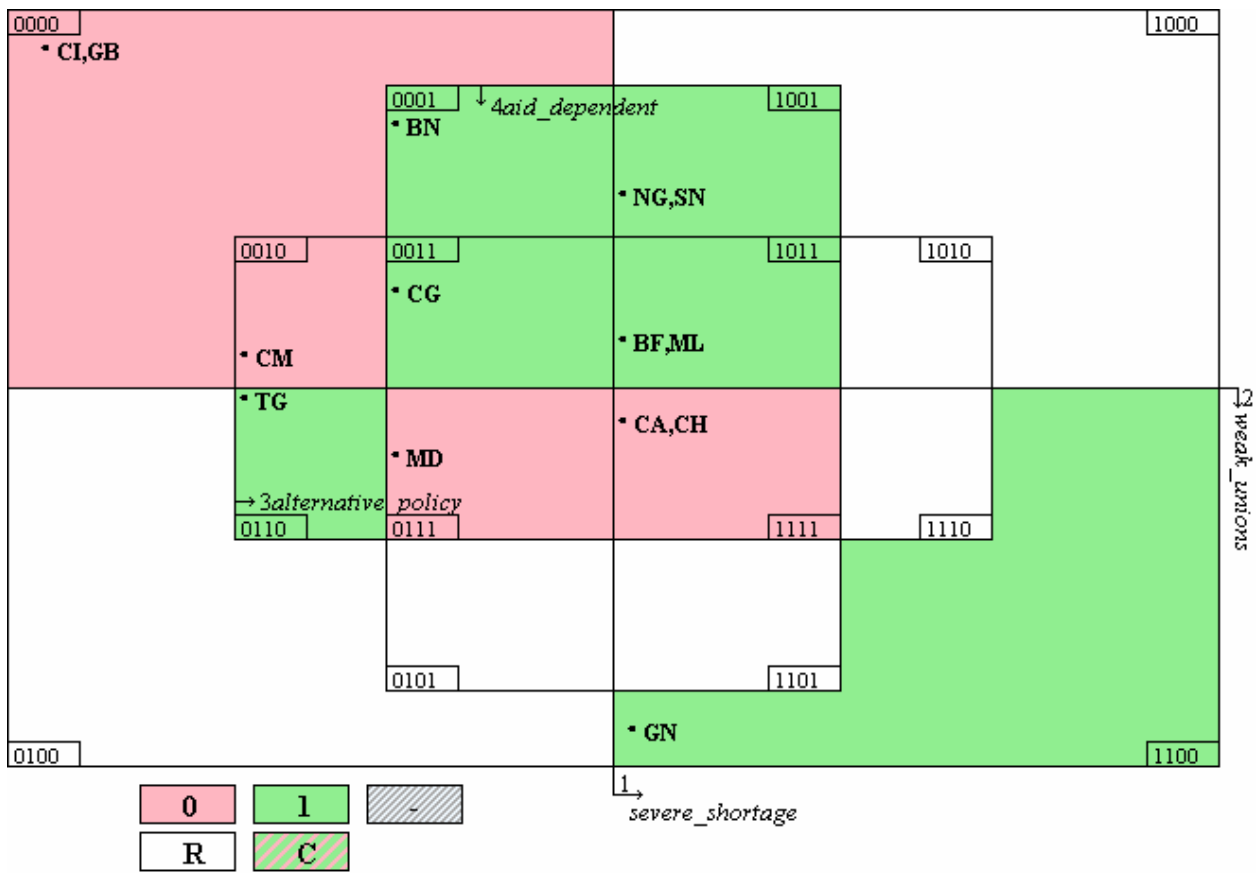
Result:

$$\begin{aligned} & \text{severe_shortage}\{0\} * \text{weak_unions}\{0\} * \text{aid_dependent}\{0\} \quad + \\ & \quad (\text{CM}+\text{CI}, \text{GB}) \\ & \text{weak_unions}\{1\} * \text{alternative_policy}\{1\} * \text{aid_dependent}\{1\} \\ & \quad (\text{CA}, \text{CH}+\text{MD}) \end{aligned}$$

Minimizing Y=0, excluding C=1, including logical remainders

$$\begin{aligned} & \text{weak_unions}\{0\}\text{aid_dependent}\{0\} \quad + \quad \text{weak_unions}\{1\}\text{aid_dependent}\{1\} \\ & \quad (\text{CM}+\text{CI}, \text{GB}) \quad \quad (\text{CA}, \text{CH}+\text{MD}) \end{aligned}$$

Venn diagram



Created with Tosmana Version 1.301

Using the data from the situation in 2007

Tosmana Report

Algorithm: Quine

Truth Table:

v1:	severe_shortage	v2:	weak_unions
v3:	alternative_policy	v4:	aid_dependent
O:	adoption	id:	code

v1	v2	v3	v4	O	id
0	0	0	1	1	BN
1	0	1	1	1	BF,ML
0	0	1	0	1	CM
1	1	1	1	1	CA,CH
0	0	1	1	1	CG
0	0	0	0	0	CI,GB
1	1	0	0	1	GN
0	1	1	1	1	MD
1	0	0	1	1	NG,SN
0	1	1	0	1	TG

Minimizing Y = 1, excluding logical remainders

$$\begin{aligned} & \text{weak_unions}\{0\} * \text{aid_dependent}\{1\} + \text{alternative_policy}\{1\} * \text{aid_dependent}\{1\} + \\ & \text{severe_shortage}\{0\} * \text{alternative_policy}\{1\} + \text{severe_shortage}\{1\} * \text{weak_unions}\{1\} * \\ & \text{alternative_policy}\{0\} * \text{aid_dependent}\{0\} \end{aligned}$$

(BN+BF,ML+CG+NG,SN) (BF,ML+CA,CH+CG+MD) (CM+CG+MD+TG) (GN)

Minimizing Y = 1, including logical remainder

$$\text{severe_shortage}\{1\} + \text{alternative_policy}\{1\} + \text{aid_dependent}\{1\}$$

(BF,ML+CA,CH+GN+NG,SN) (BF,ML+CM+CA,CH+CG+MD+TG) (BN+BF,ML+CA,CH+CG+MD+NG,SN)

Simplifying Assumptions:

$$\begin{aligned} & \text{severe_shortage}\{0\}\text{weak_unions}\{1\}\text{alternative_policy}\{0\}\text{aid_dependent}\{1\} + \\ & \text{severe_shortage}\{1\}\text{weak_unions}\{0\}\text{alternative_policy}\{0\}\text{aid_dependent}\{0\} + \\ & \text{severe_shortage}\{1\}\text{weak_unions}\{0\}\text{alternative_policy}\{1\}\text{aid_dependent}\{0\} + \\ & \text{severe_shortage}\{1\}\text{weak_unions}\{1\}\text{alternative_policy}\{0\}\text{aid_dependent}\{1\} + \\ & \text{severe_shortage}\{1\}\text{weak_unions}\{1\}\text{alternative_policy}\{1\}\text{aid_dependent}\{0\} \end{aligned}$$

Number of Simplifying Assumptions: 5

weak_unions{1}+ alternative_policy{1}+ aid_dependent{1}
 (CA,CH+GN+MD+TG) (BF,ML+CM+CA,CH+CG+MD+TG) (BN+BF,ML+CA,CH+CG+MD+NG,SN)

Simplifying Assumptions:

severe_shortage{0}weak_unions{1}alternative_policy{0}aid_dependent{0} +
 severe_shortage{0}weak_unions{1}alternative_policy{0}aid_dependent{1} +
 severe_shortage{1}weak_unions{0}alternative_policy{1}aid_dependent{0} +
 severe_shortage{1}weak_unions{1}alternative_policy{0}aid_dependent{1} +
 severe_shortage{1}weak_unions{1}alternative_policy{1}aid_dependent{0}

Number of Simplifying Assumptions: 5

Minimizing Y = 0, excluding logical remainders

severe_shortage{0} * weak_unions{0} * alternative_policy{0} * aid_dependent{0}
 (CI,GB)

Minimizing Y = 0, included logical remainders

severe_shortage{0}alternative_policy{0}aid_dependent{0}
 (CI,GB)

Simplifying Assumptions:

severe_shortage{0}weak_unions{1}alternative_policy{0}aid_dependent{0}

Number of Simplifying Assumptions: 1

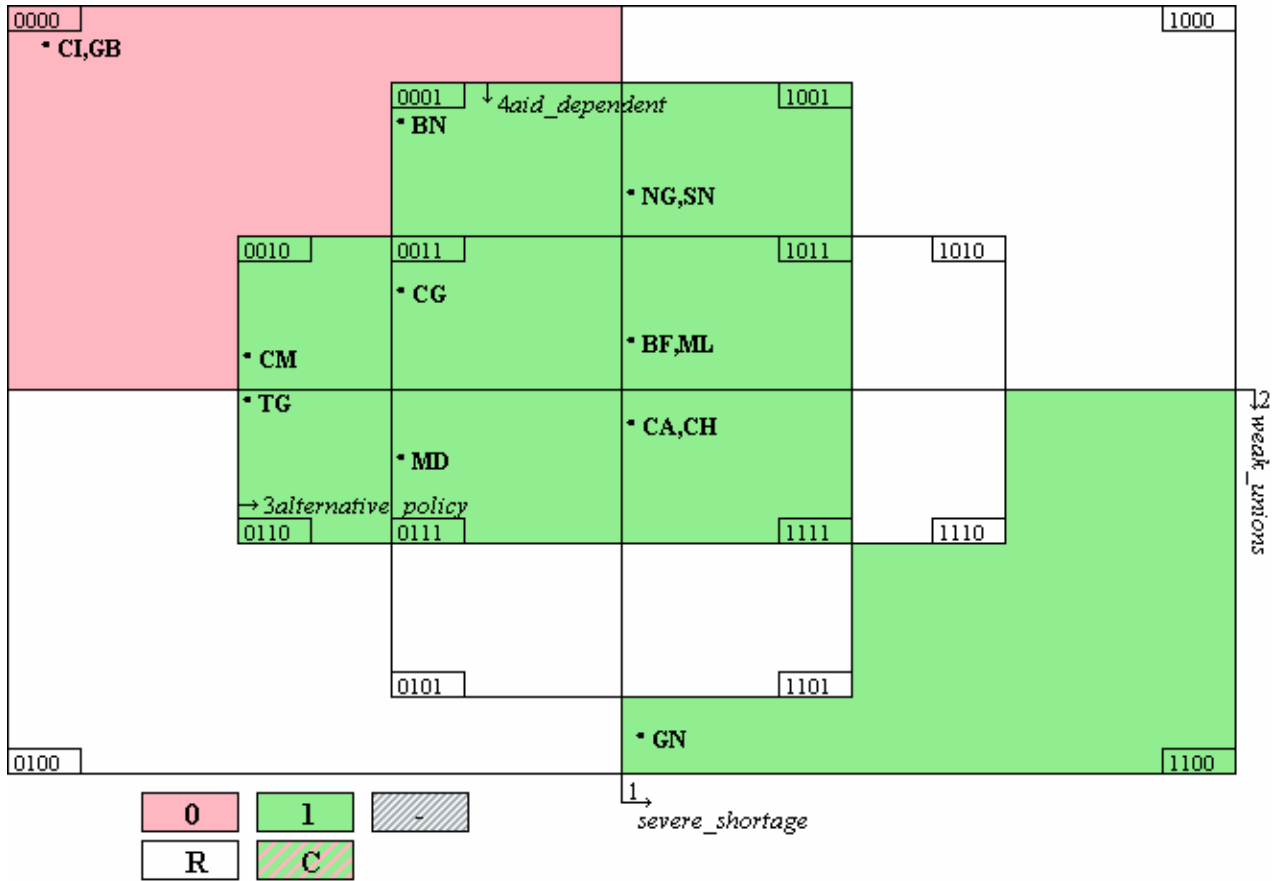
weak_unions{0}alternative_policy{0}aid_dependent{0}
 (CI,GB)

Simplifying Assumptions:

severe_shortage{1}weak_unions{0}alternative_policy{0}aid_dependent{0}

Number of Simplifying Assumptions: 1

Venn diagram



Created with Tosmana Version 1.3