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**Women in Power and Power of Women: the Liberian Experience**

**Oasis Kodila-Tedika**  
University of Kinshasa  
Department of Economics, DRC  
[oaiskodila@yahoo.fr](mailto:oaiskodila@yahoo.fr)

**Simplice A. Asongu**  
African Governance and Development Institute,  
Yaoundé, Cameroon.  
[asongusimplice@yahoo.com](mailto:asongusimplice@yahoo.com)

**AGDI Working Paper**

Research Department

**Women in Power and Power of Women: the Liberian Experience****Oasis Kodila-Tedika & Simplicie A. ASONGU**

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**Abstract**

Do women really improve conditions for gender equality after becoming heads of states? This study investigates if having a woman at the helm of country's decision making processes leads to better indicators on women conditions. Using time series observations for the period 2000-2011, we test the hypothesis with the Liberian experience. Our findings do not show significant changes between the first mandate of Ellen Johnson Sirleaf and the period before. Policy implications are discussed.

*Keywords* : Gender; Female politicians; Institutions; Africa; Liberia; Ellen J. Sirleaf.

*JEL Classification* : J16 ; O15 ; O17 ; O55 ; P48

**1. Introduction**

Do women really improve conditions for gender equality after becoming heads of states? This question is increasingly gaining scientific attention. Some gender differences have been noticed in household management, with women having an edge over men in, inter alia, the: (i) training of children and development of their potentials and (ii) purchase of goods of primary necessity (Thomas, 1990, 1994; Phipps & Burton, 1998; Hoddad & Hoddinott, 1994; Hoddinott & Haddad, 1995). More recently, a plethora of studies have linked sex to institutional problems and automatisation of women. According to Beaman et al. (2009), the presence of women in power has radically changed the perception of the electorate on the

effectiveness of women in positions of authority. The election of the woman as the head of a village (pradhan) has reduced stereotypes associated with the female sex among villagers of masculine sex in India. Another study by Beamane et al. (2012) established that where a woman has never held a position of village-head, the parental value-perceptions of differences between boys and girls are wide. The evidence of women that are village-heads increases the aspirations of parents towards their girls on the one hand and self-confidence and ambition among girls on the other hand. Pande and Topalova (2013, p. 15) have emphasised that when women occupy decision-making positions or are endowed with responsibilities of authority, they can change the aspirations of young girls by taking measures which, among others: enable women to have equal opportunities as men and promote successful women in society as role models. These two instruments coexist and cannot easily be dissociated. The emphasis is consistent with Clots-Figueras (2012) who has advanced that the causal nexus is in the following order: the gender of politicians affects the level of education of individuals growing in quarters where such politicians are elected.

More nuanced results have also been documented in the literature. Ferreira and Gyorko (2011) and Campa (2011) do not find any significant influence from increasing female representation in USA towns and Spanish municipalities respectively. According to Ferreira and Gyorko, the sex of the mayor (from the results of political elections) has no significant effect on the size of the local government, spending composition, rate of employment and level of criminality. Clots-Figueras (2011) also present interesting results. The author's work suggest that female-politicians from unprivileged or cast tribes invest more in social (education and health) and distribution on the one hand and on the other hand, on laws favoring the economic rights of women. On the contrary, female legislators from superior or privileged casts do not have any incidence on the laws favourable to women and show less concern over social issues, compared to their counterparts. Kodila-Tedika (2013) shows that female representation leads to an improvement of gender equality in political rights; but unfortunately, do not influence the legislature on violence against women and a simple correlation with economic rights of the African woman.

In light of the above, there is an apparent ambiguity in the literature on the gender-equality consequences of female political representation. The present line of inquiry takes the issues of female representation in political circles into account. The study closest to the current positioning is Kodila-Tedika (2013) who has investigated a cross-section of African countries. We incorporate some unexplored dimensions and recommendations from the study, notably: the need to engage case studies in investigating the hypothesis. Here, we are trying to

understand the incidence of the female African head of state on institutional and gender indicators. Concretely, we use time series gender-related and female rights indicators of the Republic of Liberia to assess the direct and indirect (or image) effects. The choice of Liberia is motivated by the fact that, it is the only African country within this scope for which data is available for exploration. It should be noted that: (i) for the Malawi experience with Joyce Banda (April 2012 to May 2014), data is still not yet available and (ii) Mauritius president Ameenah Gurib-Fakim has only been in office since the 5<sup>th</sup> of June 2015. Moreover, in relation to the Malawian experience, the 2015 World Development Indicators published by the World Bank on April 15<sup>th</sup> displays missing data for the period 2012-2015 for many indicators.

Before we engage the empirical analysis, it is relevant to devote some space to presenting some insights into President Ellen Johnson Sirleaf's position on issues motivating this inquiry. She is an economist graduate from the Harvard University and 2011 Nobel peace laureate who was elected as the Liberian head of state on January 16<sup>th</sup> 2006. Hence, she is the first female to have been elected into office in Africa. Her curriculum vitae reveal positions of influence in decision-making circles that favour female empowerment and gender equality. She is also affiliated to many influential organisations, notably: *Alpha Kappa Alpha Sorority, Incorporated*. It is logical to infer that she is conscious of the importance of gender equality because she is a founding member of the International Institute for Women in Political Leadership. Moreover, she was the 2011 recipient of the 'African Gender Award'<sup>1</sup> which recognises her achievements in promoting: (i) free education for children<sup>2</sup> and (ii) gender empowerment through the establishment of a fund entitled 'Market Women's Fund'. Her

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<sup>1</sup> The African Gender Awards is every two years, awarded by a Selection Committee presided by Mrs Gertrude Mongella, former president of the Pan-African parliament and is composed of: civil society personalities, a representative of the United Nations Economic Commission for Africa (UNECA), a representative of the African Union and the press. The committee evaluates improvements that African countries have made on the implementation of the Declaration for Gender Equality in Africa.

<sup>2</sup>We recall that during her first mandate, she put in place a national policy for female education which was facilitated by the United Nations Children's Fund (UNICEF) and applauded by many international partners which emphasised the following recommendations: (i) attain the second objective of the Millennium Development Goals (MDGs) on development by guaranteeing free and compulsory primary education for all and a reduction of school fees by 50%; (ii) more recruitment and training of female teachers; (iii) the putting in place of scholarly orientation counsels for girls; (iv) ending impunity benefit by teachers from sexual violence and aggression towards girls; (v) offering of civics education in schools in order to boost personal image so that girls can reject sexual violence; (vi) marginal increases of the number scholarships in favour of girls; (vii) reinforcing medical treatment systems at schools; (viii) opening of more Parent Teacher Associations (PTA) and (ix) promotion of feminine clubs and education of adults.

position on the issue investigated by this study can be partly motivated by her view on ‘women and gender’ during an interview with the African Development Bank (AfDB) “*To ensure that they get the best education possible – quality education – to enable us to increase the level of our participation, particularly among women in our society at all levels, to ensure that we become more competitive nationally and regionally. My message is to continue to pursue aggressively the skills, the education, the capacity that will make Africa as competitive in the world as any other region*” (AfDB, 2013)<sup>3</sup>.

The rest of the study organised as follows. Section 2 briefly discusses the data and methodology. The empirical analysis is covered in Section 3. Section 4 concludes.

## **2. Data and Methodology**

### **2.1 Methodology**

The objective of this study is to assess to what extent can the political influence of a female head of state be translated into changes in some gender indicators. The empirical evidence is based on time series data for the period 2000 to 2011 that is divided into two sub-samples. The first sub-sample is for the period before the election of Ellen Johnson Sirleaf (hence, BEJS). The second sub-sample is the period of her first mandate 2007-2011 (FEJS). The BEJS period is characterised by substantial political strife. This can be articulated by the high number of presidents<sup>4</sup>.

The empirical strategy consists of first calculating the means of every indicator for the two periods. To this means, we apply the ‘difference-in-means’ test. We also employ a plethora of tests for robustness purposes, notably: Pettitt (1979), the Standard normal homogeneity test (SNHT) of Buishand (1982) following Alexandersson (1986) and the assessment of Von Neumann (1941)<sup>5</sup>.

The Pettitt test is a non parametric test which does not necessitate any hypothesis on the distribution of data. It is an adaption of the Mann-Whitney test based on ranks, which

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<sup>3</sup> The interested reader can find more information on the following link : <http://www.afdb.org/en/news-and-events/article/liberian-president-ellen-johnson-sirleaf-on-women-and-gender-11587/>

<sup>4</sup> Accordingly, Charles Taylor ruled the country from August 2<sup>nd</sup> 1997 to August 11<sup>th</sup> 2003. After he stood down from office, Moses ZehBlah, then vice-president ensured the interim till October 14<sup>th</sup> 2003 when the transitional government supported by the United Nations was put in place. This transition was led by Gyude Bryant until the election of Ellen Johnson Sirleaf.

<sup>5</sup> We employ the XLSTAT-Time software for the last-four tests. The alternative hypothesis of these tests is a unique deviation. For all the tests, XLSTAT reveals p-values using re-sampling by Monte Carlo. We approximate the calculations because exact computations are either impossible or extremely time-consuming.

enables the identification of the time during which change occurs. The SNHT test is based on the null hypothesis that reduced-centred relations between the observed values of the series and mean follow a normal distribution,  $N(0,1)$ . The Buishand test is based on the null hypothesis that variables follow one or many distributions having the same mean. Finally, the report of Von Neumann is based on the sum of differenced squares between two successive values in a series. Graphs corresponding to these tests are presented in the Appendix in order to enhance readability. Beyond the statistics, the presence of two means ( $\mu_1$  and  $\mu_2$ ) implies that a rupture has been detected in the series. The detected two periods are still indicated by different lines which are apparent in the graphs.

## 2.2 Data

We use the legislation on violence against women, the economic rights of women, the political rights of the female gender, gender equality, equality of representation in rural zones and the participation of women in active life. The first measure is sourced from the Social Institutions and Gender Index (SIGI), the 2009 Gender Institutions and Development Database (GID-DB) and the Social and Welfare Statistics. These are extracted from statistics of the Organisation for Economic Co-operation and Development (OECD). This indicator provides quantified information related to domestic and sexual violence as well as sexual molestation. While this first indicator is not available for Africa, to address the shortcoming we use estimations provided by the Mo Ibrahim Foundation on economic rights. The variable ranges between 0 and 1, with values closer to 1 indicating the worst performance by countries.

The second and third measures are obtained from the Cingranelli and Richards (CIRI) Human Rights Data Project. The second variable measures a plethora of human rights criteria recognised at the international levels, notably: equal pay/salary; freedom in professional choice or employment without the need for spouse or masculine-parental approval; parity in recruitment and professional promotion practices; employment security (maternal leave, unemployment advantages, non-arbitrary firing from work...etc); non-discrimination by employers; no sexual harassment at work; right to nocturnal work; right to exercise risky professional activities and the right to work with security forces (army or police). This variable ranges from 0 to 3, with higher values indicating better results. It is important to note that, some African countries have missing observations. The missing observations are also filled with estimations from the Mo Ibrahim Foundation.

The last proxy examines many rights recognised at the international level, notably: the right to vote; the liberty of candidacy for a political office; equality in governmental functions and the right to belong to a political party. The variable ranges from 1 to 3, with higher values indicating better results. Corresponding missing data is addressed by estimations from the Mo Ibrahim Foundation on economic rights.

The equality variable is obtained from the World Bank's International Development Association (IDA) Resource Allocation Index. This variable<sup>6</sup> evaluates the level at which a country has legislated and adopted institutions and programs destined to enforcing the respect of rights and policies, which include, inter alia: (i) promoting equal access by men and women to opportunities of human capital development; (ii) promoting equal access by men and women to economic and production resources and (iii) according to men and women equal status and protection before the law. As to what regards the dimension of human capital development, emphasis is placed on: (i) education with the completion of the primary cycle and access to the secondary, (ii) access to obstetrician medical services and (iii) family planning as well as the fertility rate of adolescents. With respect to access to economic and production rights, the following are considered: participation in the work force, land title and property and inheritance rights. In relation to equal status and protection before the law, emphasis is placed on: individual and family rights, personal security (violence against women and sexual molestation) and political participation. This indicator ranges from 0 to 6, with higher values indicating better results.

The variable on equal representation in rural areas is obtained from the Performance-based Allocation System (PBAS): Rural Sector Performance Assessment (RSPA). The indicator measures the capacity of laws, politics, institutions and practices to promote an equal representation among men and women in local decision making processes. It also evaluates the representation framework of women in the rural areas (producer associations, cooperatives...etc) or the existence of legal or effective barriers (contributions and obligation of land ownership...). The indicator also varies from 0 to 6, with higher values indicating better scores.

Lastly, the variable on female participation in active life is obtained from the World Bank Development Indicators. This indicator measures the proportion of females (15 years

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<sup>6</sup> The description is consistent with that provided by the Mo Ibrahim Foundation. It is the same logic with the indicator that follows.



and above) that is economically active (participation in the production of commodities during a given period). It ranges from 0 to 100, with higher values showing better performance.

### 3. Empirical analysis

The empirical findings are presented in Table 1. Neither the first nor the last indicator gives credit to the gender-inclusive policies of President Ellen Johnson Sirleaf. Accordingly, the first indicator which is the major variable does not enable us to establish that her first mandate resulted in enhanced gender equality. In essence, no significant evolution of this indicator is found between the period before (BEJS) and her first mandate (FEJS)<sup>7</sup>. This indicator may be too broad to provide the necessary information because certain changes could counteract themselves, essentially because it embodies driving dimensions on gender equality. Hence, we consider some gender dimensions that could be influenced directly (new laws, effective application of law) or indirectly (image effect).

The last indicator was expected to reveal quite interesting results because it entails quite some interesting variables, notably: emotion and the seriousness of problems. It is also a dimension that could lead to less ambivalence, at least from an official framework within society. It relates to violence afflicted on women. Here again, we do not notice any change. The case of Ruth Berry Peal constitutes a good illustration of a problem at this level. She was captured and forced to sustain female genital mutilations (FGM)<sup>8</sup> by some members of *Sande*<sup>9</sup>. Unfortunately, the legal process against the perpetrators has not been smooth.

While Liberia is in the process of post-conflict reconstruction, with discussions from the government (which are at times translated in actions<sup>10</sup>) sexual violence remains recurrent. Some studies have established that 29% of women (married women included) have been victim of physical and sexual violence perpetrated by a male partner during the past 12 months<sup>11</sup>.

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<sup>7</sup> The results are not provided but are available upon request. The same tendency is noticed when the African Development Bank indicator of gender equality is used.

<sup>8</sup> According to 'Egalité Maintenant', more than 58.2% of Liberians have been victims of FGM.

<sup>9</sup> It is a clandestine society with substantial political influence, composed of women who encourage and practice FGM within the framework of femininity initiation rites.

<sup>10</sup> Liberia was one of the first countries to implement the UNAIDS programme for girls and women. The programme sets strategic priorities for the defence of girls' and women rights. It also ensures gender equality in the fight against HIV.

<sup>11</sup> <http://www.unaids.org/fr/resources/presscentre/featurestories/2012/april/20120413liberia/> (Accessed : 20/07/2013).

The second indicator illustrates the issue of fundamental gender inequality, which has often been neglected. At this level, we notice a significant statistical difference. The FEJS period presents relatively better results. In essence, taking into consideration the scale of measurement, the risk of minimising this deviation is important. Hence, such minimisation will be a practical error. As concerns the Pettitt test, the p-value clearly shows that the null hypothesis for a homogeneous series is rejected. Hence, we can establish that some deviation occurred between the two parties in the time series. Accordingly, the risk of rejecting the null hypothesis while it is correct is less than 0.01%. The graph associated with this result shows this deviation. In fact, the rupture occurred well before President Sirleaf came to power. As concerns the SNHT test, the risk of rejecting the null hypothesis ( $H_0$ ) when it is correct is less than 1.16%. With regard to the Buishand test, the risk of rejecting the null hypothesis while it is correct is 0.01%. Von Neumann's rapport shows that the risk of rejecting the  $H_0$  when it correct is less than 0.17%.

If from a general perspective, these different tests effectively attest to some rupture in results, it is something else when it comes to determining the point from which changes occur in the time series. The Pettitt is in favour of 2004, while those of SNHT and Buishand propose 2007. If this is the case, then Ellen Johnson Sirleaf should be responsible for changes in the series.

The female economic rights indicator converge all the deviation tests. There is a point above which this indicator is different. The point is situated around the year 2007, which is after Ellen was elected into office. The results are statistically important because the BEJS and FEJS are different. Hence, we cannot reject the hypothesis that the score realised during the first mandate of the president Sirleaf is higher relative to the period before her.

Have women become more active under the presidency of Ellen Johnson Sirleaf ? Even if the difference between the two periods appears weak, the two periods are nonetheless statistically different. For Buishand, the p-value obtained is less than 0.0001 and hence, the null hypothesis is rejected. It can therefore be established that there is an interval of time  $t$  from which the mean of variables change. The risk of rejecting  $H_0$  meanwhile it is correct is less than 0.01%. The same conclusion can be inferred from other tests related to series homogeneity, even though there is some divergence on the year of rupture. Meanwhile, in all

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cases, we cannot firmly establish that the impulse was during the first mandate of Sirleaf (or in FEJS).

When it comes to women rights, we observe a significant difference between the two periods, albeit with a low level of confidence. The lifetime of the rapport is 2 when the mean is constant. The corresponding p-value is 0.488 and we cannot reject the null hypothesis on data homogeneity. This finding is consistent with the preceding results based on other tests which have established the absence of rupture. The risk of rejecting  $H_0$  when it is correct is 48.75%.

Tableau 1. Statistical Analysis

Variables	Gender equality (BM)		Equality of representation in rural zones		Female economic rights		Participation of women in active life		Political rights of women		Legislation on violence against women	
	BEJS	FEJS	BEJS	FEJS	BEJS	FEJS	FEJS	FEJS	BEJS	FEJS	BEJS	FEJS
<b>Means</b>	2.5	2.5	2.08	3.02	0.67	1.6	66.12	66.54	2	2.4	1	1
<b>Difference-in-means test</b>			Diff=-0.937 t= -3.2641 Pr(T < t) = 0.012		Diff=-0.933 t= -2.888 Pr(T < t) = 0.010		Diff= -0.423 t= -6.798 Pr(T < t) = 0.000		Diff= -0.4 t= -1.633 Pr(T < t) = 0.089			
<b>Pettitt Test</b>	No change during the period		K= 30.000 t= 2004 p-value= < 0.0001		K=24.000 t=2007 p-value=< 0.0001		K=30.000 t=2004 p-value=< 0.0001		K=12.000 t=2005 p-value=0.222		No change during the period	
<b>SNHT Test</b>	No change during the period		T0= 7.383 t= 2007 p-value= 0.012		T0=6.944 t=2007 p-value=0.007		T0=8.297 t=2005 p-value=0.002		T0=2.667 t=2005 p-value=0.447		No change during the period	
<b>Buishand Test</b>	No change during the period		Q=4.209 t=2007 p-value=0.007		Q=4.082 t=2007 p-value=0.011		Q=4.989 t=2005 p-value=< 0.0001		Q=2.828 t=2005 p-value=0.211		No change during the period	
<b>Rapport of von Neumann</b>	No change during the period		N=0.562 p-value=0.002		N=0.611 p-value=0.001		N=0.102 p-value=< 0.0001		N=2.444 p-value=0.488		No change during the period	

BEJS: Period before Ellen Johnson Sirleaf. FEJS: First mandate of Ellen Johnson Sirleaf.

We cannot fail to acknowledge changes that have occurred during the presidency of Ellen Johnson Sirleaf. However, with regards to the underlying statistical analysis, it is not very apparent to affirm that her presidency has been a fundamental catalyst. In fact, of the four indicators for which there are some differences between the period before and during her presidency, only two display some statistical rupture during her presidency, namely: representations in rural areas and women economic rights. We are thus far from direct and indirect effects of female representation put forward in the literature on the behaviour of the underlying variables.

We also acknowledge that expectations from the first mandate of her presidency should not be overly exaggerated because this sector is affected by a number of constraints, notably: (i) informal institutions which naturally play a substantial role and (ii) certain changes for which results can only be expected in the long-term. In essence, as it has been established in many studies (Gopal & Salim, 1998), informal institutions can either consolidate or weaken formal institutions. This is the basis for social contradictions (or social tensions) and even the inapplicability and disrespect of laws. As to what concerns the issue of women, gender-inequality may fundamentally be traceable to stereotypes (Huddy & Terkildsen, 1993; Eagly & Karau, 2002).

The above findings have strong implications for contemporary African development for at least a twofold reason. On the one hand, gender equality is crucial in the fight against poverty and on the other hand, the April 2015 publication by the World Bank on attainment of Millennium Development Goals (MDGs) concludes that poverty has been decreasing in all regions of the world, with the exception of sub-Saharan Africa (Asongu & Kodila-Tedika, 2015). The narrative sustains that about 45% of countries in the sub-region are off-track from attaining the MDGs extreme poverty target. Liberia features prominently among these lagging countries. But why is gender inequality important in the responsiveness of growth to extreme poverty eradications. Consistent with Asongu and Kodila-Tedika (2014) from the Fosu conjectures, the responsiveness of poverty to growth is a decreasing function of inequality, essentially because the growth elasticity of poverty is lower than the inequality elasticity of poverty. In more specific terms: *“The study finds that the responsiveness of poverty to income is a decreasing function of inequality”* (Fosu, 2010a, p. 818); *“The responsiveness of poverty to income is a decreasing function of inequality, and the inequality elasticity of poverty is actually larger than the income elasticity of poverty”* (Fosu, 2010b, p. 1432) and

*“In general, high initial levels of inequality limit the effectiveness of growth in reducing poverty while growing inequality increases poverty directly for a given level of growth”* (Fosu, 2011, p. 11).

#### **4. Conclusion**

Do women really improve conditions for gender equality after becoming heads of states? This question has been the principal motivation of the present line of inquiry. We have considered the Republic of Liberia as our sample. The choice of this country is justified by the fact that it is the only country with a female head of state for which comparable data is available. We have scrupulously analysed six main gender indicators, namely: gender equality, equality of representation in rural areas (basic community), economic rights of women, participation of women to active life, political rights of women and legislations for the protection against violence on women. After disaggregating the dataset into two sub-samples, we have performed the difference-in-means tests on the one hand, then on the other hand analysed ruptures in the series with the Pettitt, SNHT, and Buishand tests as well as the Von Neumann rapport.

Surprisingly, we have noticed that the first and last indicators behave in an identical manner. In fact, between the period preceding Ellen Johnson’s mandate and the period of her mandate, there is not a significant difference in the means of underlying indicators. In other words, the mean values are similar. With regards to other indicators, the period before her presidency is statistically different from her first mandate. However, we only notice positive and statistical ruptures for equality of representation in rural areas and the economic rights of women. This more or less contrasts with the direct and indirect effects often associated with women in power.

The above results leave room for a number of future research directions. The use of approaches of like experimental evaluation and randomisation could be considered in the context of alternative case studies. In-depth descriptive and econometric analyses could also be considered. The use of the following indicators are also worthwhile, inter alia: the relative speaking time of females elected for legislative purposes, the content of their discourses in the National Assembly, laws initiated in view of improving the conditions of women and the nature of female parliamentary votes. The highlighted variables could be compared with those of the masculine gender to assess the effectiveness in the fight against gender inequality in

African parliaments. These suggestions would go a long way to improving the extent of knowledge on the issues.

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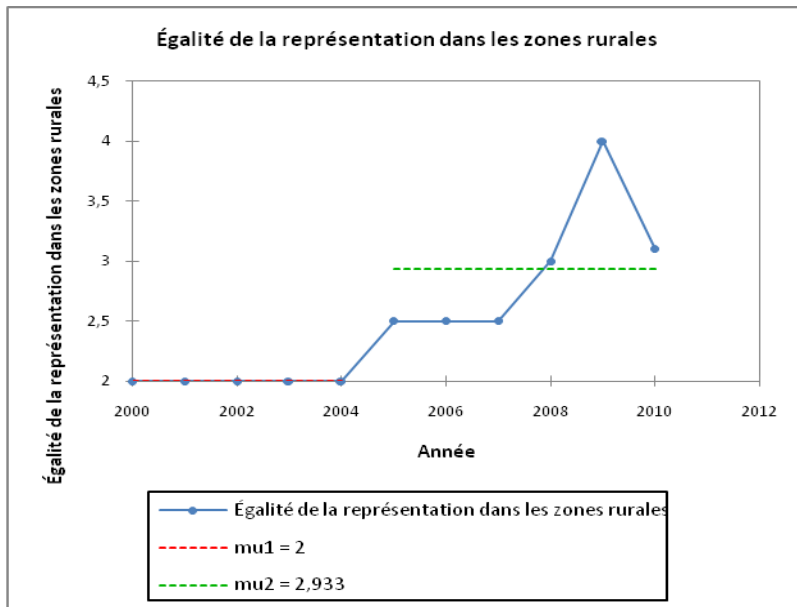
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Von Neumann J., (1941). "Distribution of the Ratio of the Mean Square Successive Difference to the Variance". *Ann. Math. Stat.*, 12, pp. 367-395.

**Appendices: Graphical representations of statistical tests for Liberia**

**Appendix 1: Equality of representation in rural areas**

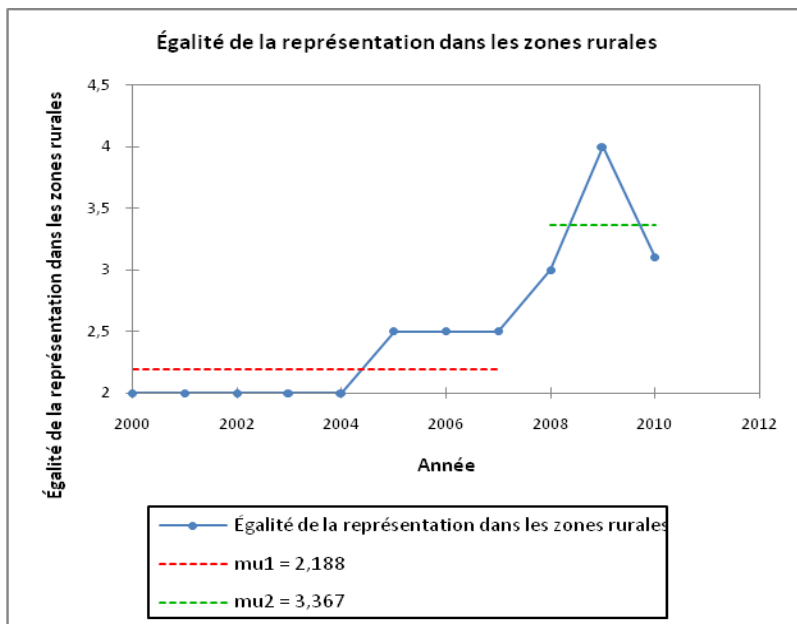
**1a. Pettitt Test**



**Y-axis: Equality of representation in rural areas**

**X-axis: Years**

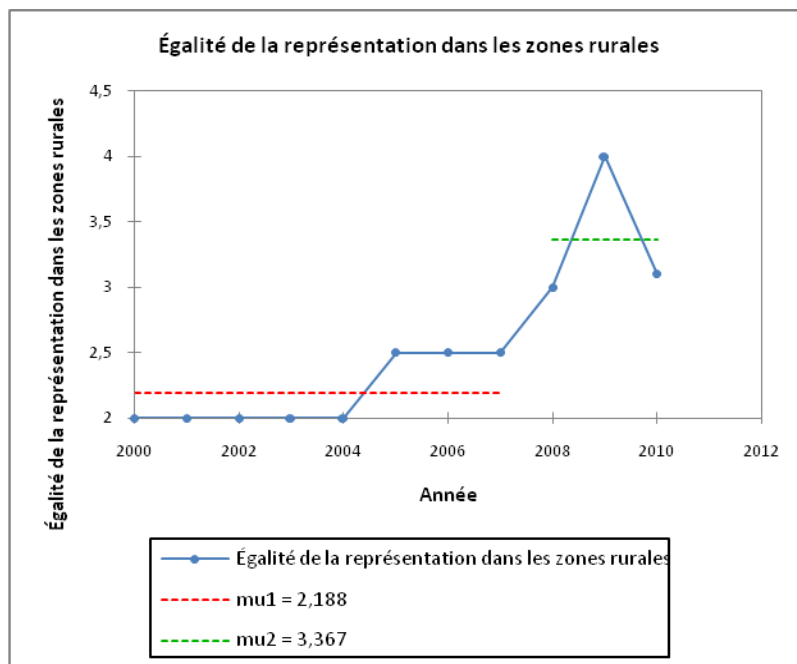
**1b. Standard Normal Homogeneity Test (SNHT)**



**Y-axis: Equality of representation in rural areas**

**X-axis: Years**

### 1c. Buishand Test

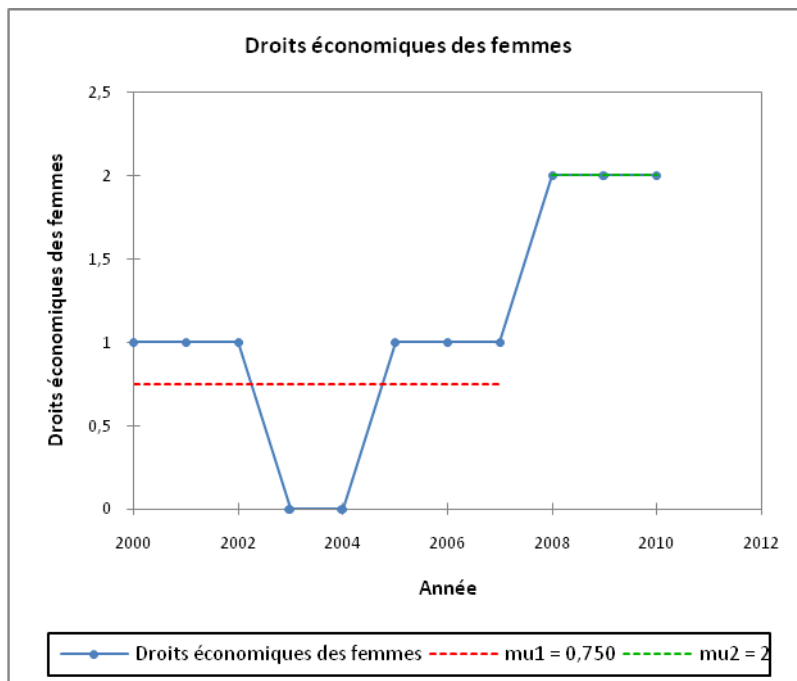


**Y-axis: Equality of representation in rural areas**

**X-axis: Years**

### Appendix 2 : Female economic rights

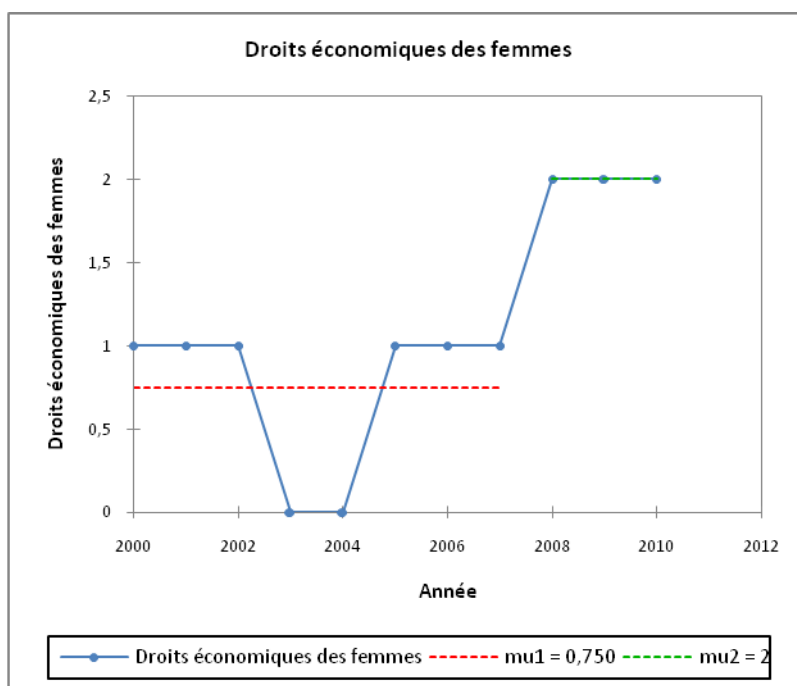
#### 2a. Pettitt Test



**Y-axis: Female economic rights**

**X-axis: Years**

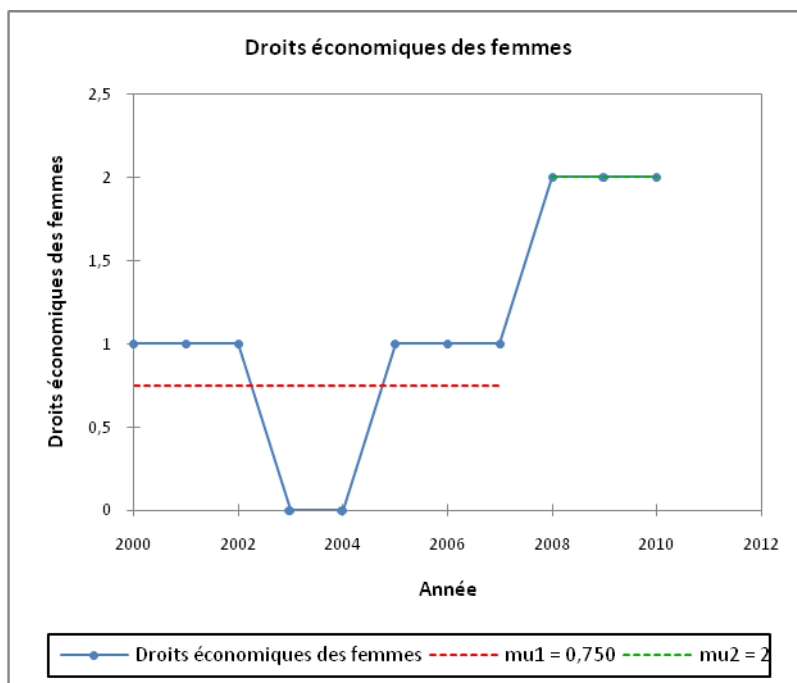
## 2b. Standard Normal Homogeneity Test



**Y-axis: Female economic rights**

**X-axis: Years**

## 2c. Buishand Test

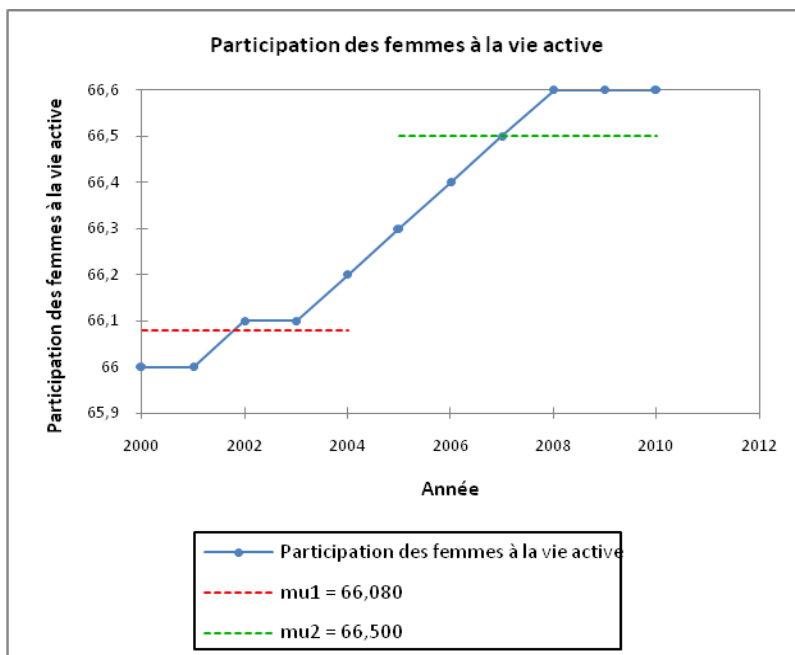


**Y-axis: Female economic rights**

**X-axis: Years**

## Appendix 3: Participation of women in active life

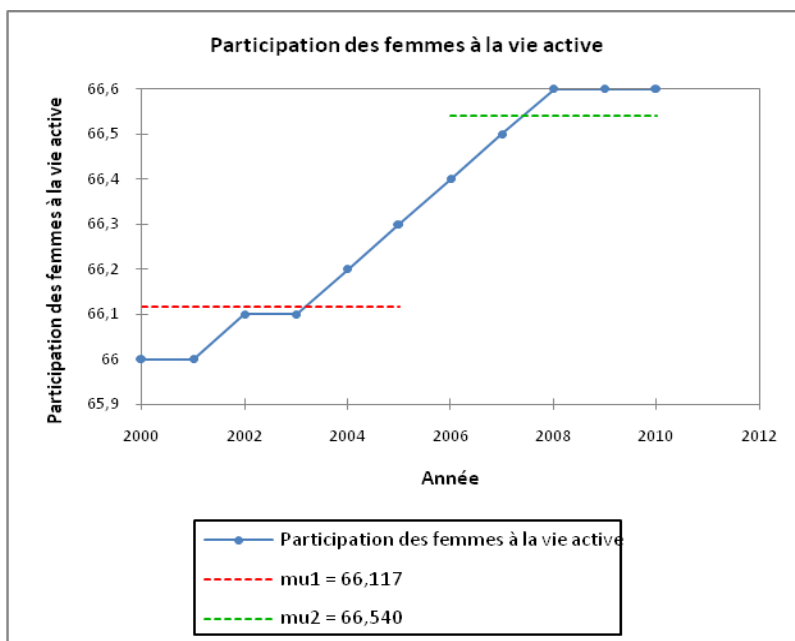
### 3a. Pettitt Test



Y-axis: Participation of women in active life

X-axis: Years

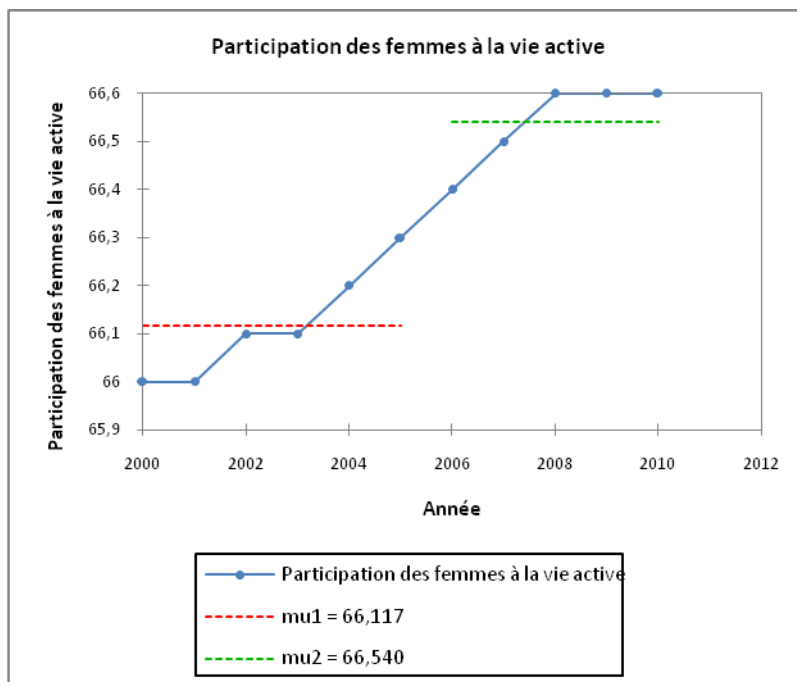
### 3b. Standard Normal Homogeneity Test



Y-axis: Participation of women in active life

X-axis: Years

### 3c. Buishand Test

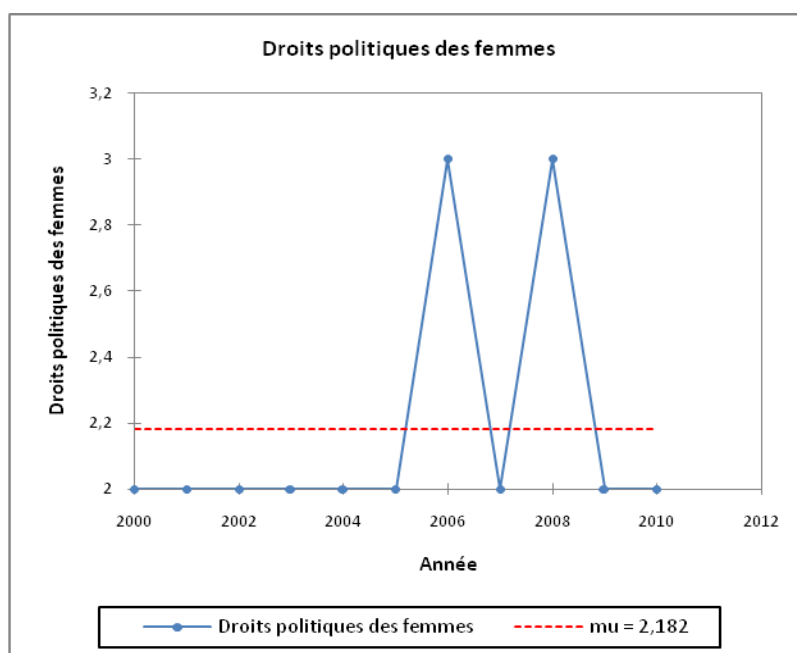


**Y-axis: Participation of women in active life**

**X-axis: Years**

### Appendix 4 : Female political rights

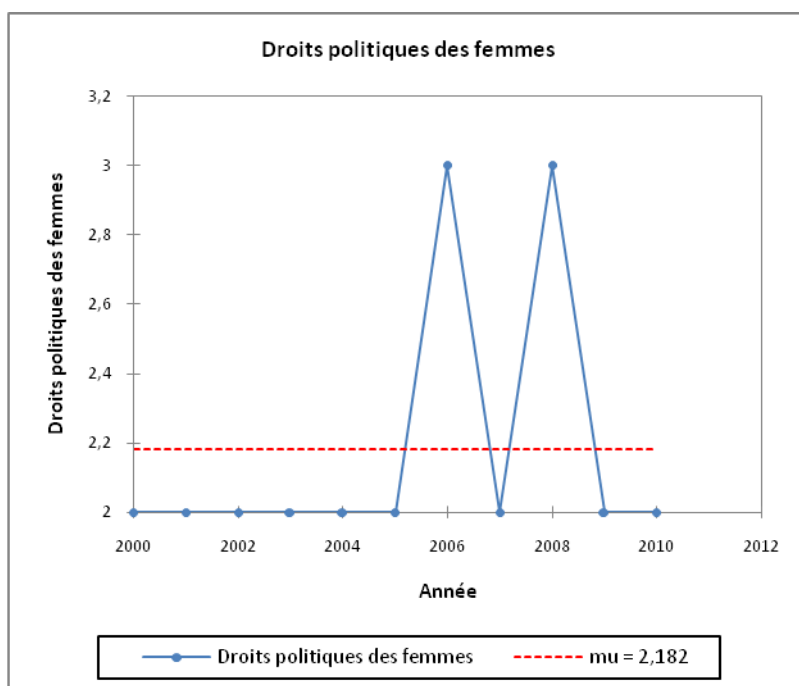
#### 4a. Pettitt Test



**Y-axis: Female political rights**

**X-axis: Years**

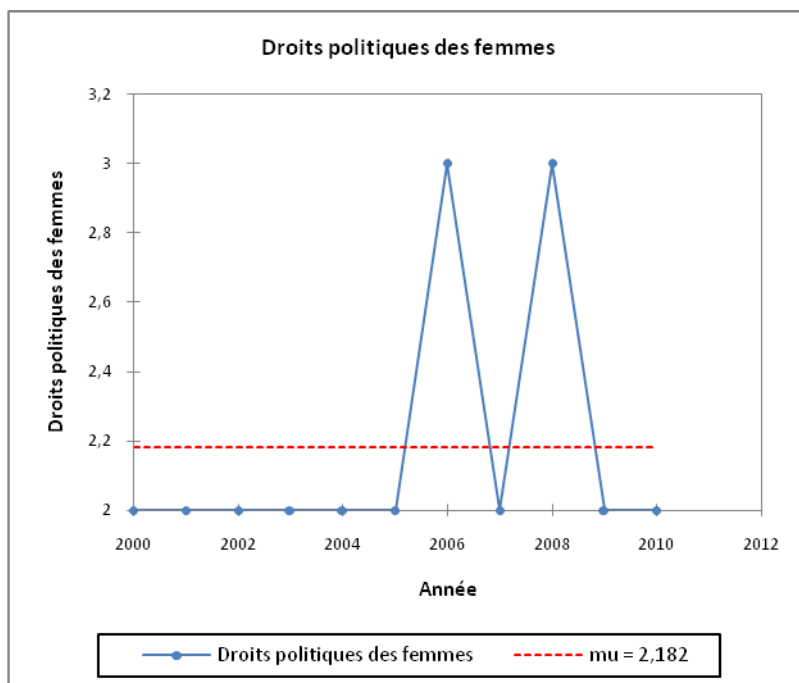
#### 4b. Standard Normal Homogeneity Test



**Y-axis: Female political rights**

**X-axis: Years**

#### 4c. Buishand Test



**Y-axis: Female political rights**

**X-axis: Years**