Only women can whisper to gods:

Voodoo, menopause and women's autonomy

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Abstract

In various parts of the world women gain autonomy in decision-making as they get older. We hypothesize that part of this age-dividend is rooted in (historical) beliefs regarding the supernatural powers of menopausal women. To test this hypothesis, we study the age- and menopause-dividend in women's decision-making autonomy in four West-African countries that include ethnic groups that practice(d) voodoo. Our empirical analysis relies on several rounds of DHS surveys, and a difference-in-differences strategy, in which we exploit the quasi-exogenous variation in the timing of menopause as well as the historical variation in magicoreligious beliefs across ethnicities. We find that (1) the age-dividend in women's autonomy is more pronounced in ethnic groups that practice(d) voodoo, (2) the menopause-dividend is only observed among women from these groups, and (3) it is especially large for women whose husbands believe that illness can have a supernatural cause. We also document a tangible welfare effect, in terms of a higher Body Mass Index among menopausal women of voodoo-related ethnic groups. Our study constitutes the first attempt to unpack the cross-cultural age-dividend in women's autonomy, thereby contributing to the detailed contextual knowledge needed for designing effective female empowerment policies.

1. Introduction

After decades of advocacy, empowering women is now firmly established as the fifth Sustainable Development Goal: “Achieve gender equality and empower all women and girls”.ⁱ Underlying this aim is the recognition not only of the intrinsic value of gender equality, but also of its instrumental value. The ‘business case’ for women empowerment mainly builds on evidences of its positive impact on the uptake of family planning programs (e.g. Ashraf et al., 2014), children’s health and nutrition (e.g. Duflo, 2003), and increased efficiency in household production (e.g. Goldstein and Udry, 2008). However, in a review of the literature, Duflo (2012) concludes that empowering women is not the miracle solution that will bring about economic development. For one, women’s preferences do not always align more than men’s with development goals. Second, in the face of sticky social norms, a one-shot intervention to boost one aspect of women’s empowerment may have no favorable effect on economic development. A telling example is provided by Field et al. (2010), who find that the positive impact of a business training for women in India did not extend to Muslim women, because their restricted mobility prevented them from putting their knowledge to use.

This example illustrates what motivates this paper: designing effective female empowerment policies requires a thorough understanding of cultural norms, and how they apply differently to different women in society. In this paper, we focus on the variation of women’s autonomy in decision making across age and ethnic groups in four West-African countries. We hypothesize that such variation is rooted in magicoreligiousⁱⁱ beliefs about the power of elderly women, in particular to the voodoo belief that menopausal women, so-called ‘tassinons’, can interact with the invisible world and derive supernatural power from this interaction. These alleged powers, in their turn, increase the bargaining power of elderly women in their communities and households. Alternatively, it could be that the belief in the supernatural power of menopausal women has faded, but the cultural norm derived from it, i.e. increased awe for elderly women, persists.

To test our hypothesis, we rely on 9 Demographic and Health Survey (DHS) rounds from Nigeria, Togo, Ghana and Benin, four countries that belong to the Gulf of Guinea, home to the four ethnic groups which historically relate to voodoo (Fon, Ewe, Adja and Yoruba). Our outcome variable is women's autonomy in household decision-making, defined for about 21,000 women aged 15 to 49. We start from the observation that such autonomy increases with age, and that this age-dividend is stronger for women belonging to the four 'voodoo-ethnicities'. Then, we provide evidence for a menopause-dividend in women's autonomy, that exists – on top of the age-dividend – only among women of voodoo-ethnicities, as well as a higher BMI for these women. Since menopause is an exogenous event, outside the control of the individual, this result indicates that the associated gain in autonomy and BMI is caused by 'something' that has to do with menstrual bleeding and is particular for voodoo-ethnicities. In support of the proposed 'tassinon mechanism', we show that the menopause-dividend is especially strong for women whose husbands believe in the intimate relation between the visible and invisible world and human agency herein, proxied by the self-reported belief that HIV-AIDS can be transmitted by witchcraft. To provide flesh to the bones, we complement our quantitative analysis with narratives from traditional leaders, voodoo priests and menopausal women, obtained through qualitative fieldwork in Benin.

In terms of contribution, we are – to the best of our knowledge – the first to specifically address the cross-cultural variation of the age-dividend in women's autonomy, and the first to quantitatively relate women's autonomy to cultural attitudes rooted in magicoreligious beliefs. While neither voodoo nor menopause are commonly studied in the field of economics, our work constitutes a contribution to three strands of economic literature: (1) the individual-level determinants of female autonomy, (2) the (historical) origins of cross-cultural differences in gender norms, and (3) the economics of magicoreligious beliefs. In addition, we speak to at least three distinct fields outside economics: (4) the feminist literature on complex identities of African women, (5) the anthropological literature on the relation between magicoreligious beliefs and women's agency, and (6) the anthropology of menstruation. What we add transversally to these

different strands is a specific focus on elderly women in Sub-Saharan Africa (SSA). This is a timely focus. As fertility declines and life expectancy increases, elderly women are making up an increasing share of the SSA population.

The next section briefly outlines the key aspects of these six strands of literature. In section 3, we provide background to the pre-colonial magicoreligious beliefs that prevail(ed) in the Gulf of Guinea. In sections 4 and 5, we present our empirical framework and data, before discussing results in section 6. Section 7 explores the underlying mechanisms driving our results and section 8 concludes.

2. Literature

In the wake of theories on intra-household bargaining (Manser and Brown 1981, McElroy and Horney 1981, Chiappori 1988, 1992, Lundberg and Pollak, 1993), a large number of country case studies set out to identify the individual-level determinants of women's autonomy in decision-making vis-à-vis their husband (e.g. Anderson and Eswaran 2009, Azra Batool et al. 2017, Darteh et al. 2014, Fuseini and Kalule-Sabiti, 2016). In general, these studies find that age is a positive determinant of women's decision-making autonomy. Two cross-country studies confirm this finding. First, in an analysis of DHS data from 58 countries, representing almost 80 percent of the female population of developing countries, Hanmer and Klugman (2016) find that age positively relates to several measures of women's agency and empowerment. Second, in a study of pooled DHS surveys from 23 different countries, Kishor and Subaiya (2008) conclude that *"the significant increase in decision-making alone with age is not explained away by any of the control variables, suggesting that aging directly and positively influences decision-making alone."* (p.22). Only a handful of studies devote attention to the underlying reasons for the age-dividend. Reviewing a number of such studies, Mason and Smith (2003, p.15) conclude that *"older women are argued to have more independence and empowerment than younger women because they have more experience with life, a better understanding of how to get what they want or need, a closer relationship with the husband, or because they have fulfilled certain social obligations to the husband"*

and his family (for example, bearing children or sons) and thus are more trusted than are young wives, over whom tighter controls are maintained". While these reasons remain speculative, our paper attempts to empirically pin down an explanation for the age-dividend in women's autonomy.

By searching for a culturally rooted explanation, we follow in the footsteps of a number of scholars who have investigated cross-cultural variation in gender norms. For instance, Alesina et al. (2013) empirically demonstrate that differences in present-day gender roles relate to the form of agriculture practiced in the pre-industrial period; Alesina et al. (2016) uncover the pre-colonial determinants of contemporary domestic violence against women in Africa; while Fenske (2015) and Dalton and Leung (2014) estimate how polygyny in Africa today relates to colonial institutions and the intensity of the slave trades. Outside SSA, attention has focused among others on how the main monotheistic religions have affected cross-cultural gender norms, through centuries of religious socialization (e.g. Esping-Andersen 1999, Haddad and Esposito 1998). We study if and how gender norms are rooted in magicoreligious beliefs in Africa.

By doing so, we contribute to the small but growing economic literature that studies the impact of magicoreligious beliefs in SSA on social behavior, human well-being and development outcomes. Gershman (2016), for instance, demonstrates that witchcraft beliefs are correlated with mistrust; Platteau (2014) argues that the threat of witchcraft accusations discourages the accumulation of private wealth and entrepreneurship; Stoop et al. (2017) estimate a negative impact of voodoo-adherence on the uptake of biomedical preventive health care; Briones Alonso et al. (2016) study the role of voodoo in the management of the commons; Nunn and Sanchez de la Sierra (2017) demonstrate that magicoreligious beliefs in the armed conflicts in eastern Congo help organizing community defense; and LeMay-Boucher et al. (2012) document large expenditures on magicoreligious protection by households in Benin. These studies quantitatively demonstrate that magicoreligious beliefs play an important role in various domains of development in SSA. In our study, we explicitly link magicoreligious beliefs to intra-household bargaining power of women, in particular elderly women. Closely related is the study by Miguel (2005) who shows that, in Tanzania,

especially elderly women fall victim to ‘witchcraft’ⁱⁱⁱ accusations and killings in times of sharp income shocks – caused by drought or flood. Like Miguel, we study the impact of magicoreligious beliefs on elderly women. But, whereas Miguel shows that – in times of great distress, in Tanzania – elderly women are the victim of their alleged supernatural powers, we demonstrate that – in normal times, in the Gulf of Guinea - these powers provide them with agency. In this respect, our results and those of Miguel (2005) can be seen as two sides of the same coin. On the other hand (and as explained in the next section), the supernatural powers of the menopausal women in our study region are believed to relate mainly to familial deities and not to collective deities which are under the control of voodoo priests. Hence, it is unlikely that major rainfall shocks, which are prescribed to collective deities, will be blamed on tassinsons.

Studying age in tandem with gender responds to a concern of the African feminist literature, that has long argued that the Western gender concept is alien to Africa. Instead, in most African societies, seniority is the key dimension of identity and status. When describing the Yoruba society in Southwestern Nigeria, Oyêwùmí (1997) argues that *“the fundamental organizing principle within the family is seniority based on relative age, and not gender”*. Thus, the person with the most seniority, regardless of gender, will assume the position of authority; and a woman’s status in the extended family increases over time, as her age advances in relation to those around her. In addition, whereas the traditional Western notion of man and woman is largely binary and inherent in nature, the traditional African notion is fluid and highly situational and does not depend on body type, as aptly demonstrated in Amaduime’s *“male daughters, female husbands”* (1987). Menopause can pose such a situational factor that disrupts the dichotomy of the man/woman categories. For instance, in her ethnographic study of the Beti society in South-Cameroun, Vincent (2003) argues that *“the menopause marks the access to a higher status: the menopausal woman is liberated from the submission to the man. She has become his equal; she is ‘like a man’, as many informants put it”*.^{iv} Our study explores the intersectionality of gender, age and menopause, thus providing a quantitative test for the critique of a one-size-fits-all approach to gender in an African context.

Another closely related non-economic strand of literature is concerned with the relation between magicoreligious beliefs and the agency of women. Regarding this relation, Igreja et al. (2008) describe the widespread prevalence of *gamba* spirits in post-war Mozambique. These are spirits of male war casualties that take possession of women's bodies and, by doing so, not only help process memories of the war but also improve the status of women who greatly suffer(ed) in the war and post-war context (p. 364-365) "*Contrary to everyday conjugal unions, in which the wife is expected to subordinate herself to the husband, in this case the husband must subordinate himself, via the spirit, to his wife... In this society, people who accommodate spirits are entitled to respect and power*". Also in various other African cultures, women possessed by spirits command respect, thus turning the usually assumed male-female dichotomy upside down (Lewis 2003; Masquelier 2001). As we will further explain in the next section, menopausal women in voodoo-cultures are not thought to be possessed by a spirit, but are thought to be able to communicate with familial deities.

A final strand of related ethnographic literature is the rather extensive body of studies on the 'anthropology of menstruation'. In 'Blood magic', an edited volume on the topic, Buckley and Gottlieb (1988) start by acknowledging that "*the topic of menstruation has long been a staple of anthropology, for this apparently ordinary biological event has been subject to extraordinary symbolic elaboration in a wide variety of cultures.*" Anthropologists have especially focused on rites of passage - menarche rituals in the case of girls, as well as on menstrual taboos. The menopause has received much less attention, although there are a few noteworthy exceptions, such as Héritier-Augé (1998)'s "Anthropologie de la menopause", and the above-mentioned study by Vincent (2003) of the Beti society in South-Cameroun. This literature goes against the popular (Western) view of menstrual taboos as a sign of oppression and lower status of women (for such stereotyping see e.g. Weideger's 'Menstruation and Menopause', 1976). Instead, several ethnographers point to the benefits of those taboos for women, as well as the spiritual nature of the taboos, which suggest that they are part of wider religious systems with cosmological ramifications (e.g. Buckley and Gottlieb, 1988). With respect to this religious character, note that menstrual taboos are also found both in Islam and

Christianism.^v While our paper is not directly concerned with menstrual taboos, we need to take note of such taboos, as they may provide a competing explanation for our findings. Indeed, it may be the lifting of such taboos that explains the increase in autonomy of menopausal women, rather than the actual positive effect of entering into menopause.

We will address this concern in the empirical analysis. Now we turn to a background section on the role and status of menopausal women in voodoo cultures, both as described in the literature and as revealed during qualitative interviews in Benin.

3. Background and hypotheses

African traditional religions are characterized by a continuum between the visible and invisible world. The invisible world includes the supreme being (God), but also lesser entities such as divinities, ancestors and spirits, who are believed to possess powers that can influence earthly life. These powers can be used by the spirits and ancestors themselves, but they can also be exploited by humans through sacred rituals, or through ‘witchcraft’ (Geschiere, 2013).

Voodoo is the name of a relatively widespread and well-documented African traditional religion, that still remains vibrant today. The word ‘voodoo’, also ‘vodun’, stands for ‘spirit’, ‘god’ or ‘deity’. Its etymology relates to the Ewe word *vo*, translated as hole or opening, and to the Yoruba term *du* or *odu* used to designate divination signs (Gilli, 1976, cited in Norman, 2009). This word combination illustrates that voodoo originates from the meeting of the traditional Yoruba cult and the deities of the Fon and Ewe ethnic groups, with Oyo and Abomey as respective institutional centers (Delanne et al., 2010). This meeting occurred during the creation of the Dahomey kingdom in the 17th century, in present-day Benin. Whenever the kings of Dahomey (residing in the capital city Abomey) conquered land, they adopted its deities and religious chiefs (Bay, 1998; Soumonni, 2012). As a result, voodoo evolved into a ‘new’ supra-clan religion and spread in tandem with the kingdom’s expansion. In particular, during the incumbency of king Agadja (1708-1740), voodoo expanded eastward up to the Oyo kingdom in Nigeria, and westward up to Ghana’s Ashanti

kingdom. Today, voodoo is practiced along the Gulf of Guinea in the coastal areas of Benin, Togo, Ghana, Nigeria and to some extent in Côte d'Ivoire (Lando, 2013). Macé (2005) labels the coastal area spanning eastern Ghana, Togo, Benin and western Nigeria as 'voodoo land'. The groups with their historical homeland in this area include the Fon, Ewe, Adja and Yoruba, as well as smaller related groups, namely the Gun, Toli, Ayizo, Xweda, Xwla, Popo, Waci and Gen (Delanne et al, 2010; Médiohouan, 1993). In our empirical analysis, we will treat these four families of ethnic groups as 'voodoo-related'.

Voodoo deities can be grouped in two main categories: *tovodun* or collective deities, and *bennu vodun* or the familial deities (Horton, 1983). *Tovodun* relate to different natural elements, such as the sea, the earth, or thunder. *Hennu vodun* are deified ancestors. After death, they turn into spirits who interact with the family or the clan. They are symbolized by "*the asen, which are moveable metal objects able to hold or affix spiritual entities.*" (Bay, 2008, p.1). Each family keeps its ancestral *asen* in a sacred space, called *debo*. Every individual member of a family is supposed to visit the *debo* at least once annually during a ceremony called *de biho nu asen*. This ceremony is led by a menopausal woman, referred to as the *tassinon*, literally meaning 'elderly paternal aunt'.^{vi} Each family has its own *tassinon*. She is chosen, among the family's menopausal women, by the oracle (*Fâ*), a complex divination system based on 256 figures and thousands of verses, which are memorized and interpreted by a diviner.^{vii} For the specific case of the *tassinon* choice, the presence of all important family members and other dignitaries of the locality is required to witness the sign revealed by the *Fâ* and cross-check its interpretation.^{viii}

During *de biho nu asen*, only the *tassinon* can transmit the prayers and vows (*de biho*) of the family members to the ancestors and consult the oracle to see if the spirits have accepted the offering and sacrifices. Furthermore, on a daily basis, the *tassinon* venerates the family ancestors through special prayers and incantations (Adohouannon, 2015). This function provides her with agency. For instance, according to Adohouannon (2015): «*The tassinson might also use her supernatural powers to send witchcraft to people and harm their life. A very easy way is to give a forbidden meal or drink to the*

hennu vodun on behalf of the one she intends to harm.» Based on this agency, the tassinson occupies a special status at the level of the extended family, and even wider community. According to (Delanne et al, 2010: 166) «*The tassinson's judgement or opinion is final. Nobody, even the Dah (head of the family, head of village, king) can challenge it* ».

To complement the thin literature on tassinson, the first author of this paper undertook qualitative fieldwork in 17 different localities in six distinct zones of Benin, which are all part of 'voodoo land'.^{ix} The fieldwork consisted of semi-structured interviews with 103 informants. In selecting the respondents, the purpose was to learn about the tassinson institution. Therefore, the sampling was not random, but purposefully targeted chiefs and kings of the localities, voodoo priests of the main voodoo convents, and tassinsons, who were contacted through the convents and subsequently by snowball sampling. In the end, semi-structured interviews were conducted with 62 traditional leaders and voodoo priests (males, indicated below by M), 39 tassinsons (indicated by T), and two professors at the Faculty of Sociology of the University of Abomey Calavi (Benin), both specialized in gender in Benin (indicated by P). Below, we summarize the main takeaways from the interviews, and refer to supportive narratives in Supplementary Appendix 1.

The interviews make clear that each extended family that keeps contact with its own *hennu vodun*, has a tassinson designated by the Fâ. In performing the rituals, the tassinson can be assisted by other women of the extended family. These women are almost always menopausal but they are not chosen by the Fâ, and have a less important role [T6, M55]. The assistants may replace the tassinson in case of her absence or sickness. In this specific condition, their words and prayers are also sacred but remain less powerful compared to those of the tassinson [T29, M72]. The interviews confirm that the tassinson serves as an intermediary between family members and family ancestors and is believed to have supernatural powers [M8]. The respondents also stress the impact of the tassinson on both fortune and misfortune in the family (e.g. infertility, illness), and how this impact is brought about on simply request to the [hennu] vodun [T25, T45, T34]. Because of her powers, the dominant feelings of people vis-a-vis the tassinson (and her assistants) are fear and respect [M5,

T68, T17]. It is also stressed that tassinsons enjoy a high status in the extended family, even to the same extent as the chief of the extended family [M4, T25]. In this status, the tassinson is involved in all main social events (as a counselor and ceremony master), not only in her family, but also in the wider community [M1, M28]. According to the interviewees and of central importance to this study, the tassinson status comes with greater involvement in decision making and autonomy at the household, extended family and community level. Particular attention is paid to the tassinson's requests, wishes and recommendations: « *My opinion matters now in all important decisions or issues in the family and in my community. It was not the case before my designation by the Fâ as tassinson. I could not even attend or talk in certain audiences* » [T6]. At the personal level, the enhanced social status is a source of pride and self-esteem [T9]. But, the increased status also has a downside. The tassinson must be available to people and the worship ceremonies can be time consuming [T16].

In sum, our interviews reveal that the tassinson is believed to have supernatural powers that can influence her family members' destiny in one way or another; the tassinson is feared and enjoys respect; the status comes with greater involvement in decision making and autonomy both at household, extended family and community levels. This greater involvement is likely to be a blessing, but could also be a curse as it may require an important time investment. Which one dominates – blessing or curse - is an empirical question to be tested. Furthermore, although the power and associated status is concentrated in the tassinson, we hypothesize that other menopausal women may enjoy spill-over effects, for at least four reasons: (1) As assistants of the tassinson, they are in close communication with her and can therefore influence her actions; (2) the assistants may replace the tassinson in case of her absence or sickness; (3) each menopausal woman has a chance to be chosen by the Fâ as the successor of the tassinson, should she pass away; and – more indirectly - (4) the tassinson institution may have translated into a cultural norm that commands respect for menopausal women in general.

Informed by the literature and our qualitative findings, we thus hypothesize that women of voodoo ethnicities gain decision-making autonomy when they get older, and in particular when

they enter menopause. In addition, we hypothesize that their enhanced status and autonomy increases their wellbeing, proxied by their Body Mass Index (see below). Regarding the underlying mechanisms, we have three possibilities in mind: (1) There could be a general cultural norm at play commanding awe for elderly and menopausal women, or (2) the menopause-dividend could be due to a more narrow tassanon effect rooted in the actual and present-day fear for the supernatural powers of the (future) tassanon and her assistants, or (3) it could be the case that the tassanon effect passes through an income channel, with the tassanon and her assistants deriving a higher income from ceremonial functions and the associated larger social capital, which in its turn provides them with more intra-household bargaining power. We will tentatively test for these channels in Section 7.

4. Empirical strategy

Our empirical strategy is based on a Difference-in-Differences (DiD) approach, in which we consider how women's autonomy varies across age and menopause, and how this variation differs by ethnic group. We proceed gradually, by means of five estimating equations.

First, we estimate the simple age-dividend in women's autonomy using the following equation:

$$\begin{aligned}
 (Eq.1) \quad & Autonomy_{hwm} \\
 &= \alpha_0 + \alpha_1 Woman\ age_{hw} + \alpha_2 X_{hw} + \alpha_3 X_{hm} + \alpha_4 X_c \\
 &+ \alpha_5 X_h + \Delta Region_h + \nabla DHS_{year} + \varepsilon_{hwm}
 \end{aligned}$$

where h indicates household, m the husband, w the individual woman, and c the couple. $Woman\ age_{hw}$ is our independent variable of interest; $Autonomy_{hwm}$ is the autonomy index, that we further explain in the data section below; X_{hw} is a vector of woman-level characteristics that includes her years of schooling, her height and an indicator variable for her religion; X_{hm} is the set of husband-level characteristics comprising his years of schooling and an indicator variable for whether he lives together with the woman; X_c stands for the age difference between the man and

woman in the couple, while X_h includes the household's residence area (urban/rural), and wealth quintile.^x We also control for the administrative region of residence of the household ($Region_h$)^{xi} and for the year in which the DHS survey took place (DHS_{year}) to capture time trends across consecutive survey rounds.

Second, we turn to a first DiD equation to investigate whether there is cross-cultural heterogeneity in the effect of age on women's autonomy:

(Eq.2) $Autonomy_{hwm}$

$$\begin{aligned} &= \beta_0 + \beta_1 Woman\ age_{hw} + \beta_2 Woman\ is\ of\ voodoo\ ethnicity_{hw} \\ &+ \beta_3 Woman\ age_{hw} * Woman\ is\ of\ voodoo\ ethnicity_{hw} + \beta_4 X_{hw} + \beta_5 X_{hm} + \beta_6 X_c \\ &+ \beta_7 X_h + \Delta Region_h + \nabla DHS_{year} + \varepsilon_{hwm} \end{aligned}$$

In this equation, the estimated coefficient β_3 on the interaction term indicates whether the age-dividend is different for women of voodoo-related ethnicities. The binary variable $Woman\ is\ of\ voodoo\ ethnicity_{hw}$ absorbs the cross-cultural difference in the level of autonomy, averaged across all ages.

Third, we estimate the effect of menopause on women's autonomy, by means of the following equation:

(Eq.3) $Autonomy_{hwm}$

$$\begin{aligned} &= \gamma_0 + \gamma_1 Woman\ age_{hw} + \gamma_2 Menopause_{hw} + \gamma_3 X_{hw} + \gamma_4 X_{hm} + \gamma_5 X_c + \gamma_6 X_h \\ &+ \Delta Region_h + \nabla DHS_{year} + \mu_{hwm} \end{aligned}$$

$Menopause_{hw}$ is a dummy variable taking the value 1 if the woman is menopausal and 0 otherwise.

Fourth, we turn again to a DiD specification, examining the coefficient on the interaction term between menopause and the dummy variable capturing whether the woman belongs to a voodoo related ethnic group. Concretely, the specification takes the following form:

(Eq. 4) $Autonomy_{hwm}$

$$= \delta_0 + \delta_1 Menopause_{hw} + \delta_2 Woman\ is\ of\ voodoo\ ethnicity_{hw} + \delta_3 Menopause_{hw} \\ * Woman\ is\ of\ voodoo\ ethnicity_{hw} + \delta_4 Woman\ age_{hw} + \delta_5 X_{hw} + \delta_6 X_{hm} + \delta_7 X_c \\ + \delta_8 X_h + \Delta Region_h + \nabla DHS_{year} + \vartheta_{hwm}$$

δ_3 captures the additional menopause-dividend in voodoo-cultures, which, we argue, stems from the tassinon institution. Consequently, we refer to it as the ‘tassinon effect’.

Finally, we add the interaction term $Woman\ age_{hw} * Woman\ is\ of\ voodoo\ ethnicity_{hw}$ to Eq.4 in order to isolate the menopause-dividend and the tassinon effect from the more general age-dividend and its additional voodoo-effect. This gives the following:

(Eq. 5) $Autonomy_{hwm}$

$$= \sigma_0 + \sigma_1 Menopause_{hw} + \sigma_2 Woman\ is\ of\ voodoo\ ethnicity_{hw} \\ + \sigma_3 Menopause_{hw} * Woman\ is\ of\ voodoo\ ethnicity_{hw} + \sigma_4 Woman\ age_{hw} \\ + \sigma_5 Woman\ age_{hw} * Woman\ is\ of\ voodoo\ ethnicity_{hw} + \sigma_6 X_{hw} + \sigma_7 X_{hm} + \sigma_8 X_c \\ + \sigma_9 X_h + \Delta Region_h + \nabla DHS_{year} + \tau_{hwm}$$

ε_{hwm} , μ_{hwm} , ϑ_{hwm} and τ_{hwm} are error terms.

To verify whether the increased social status is welfare-enhancing rather than posing an additional burden on women’s time use, we replace $Autonomy_{hwm}$ with woman’s *Body Mass Index*_{hwm}. We estimate the equations using linear least squares. In all cases, we use heteroscedasticity-robust statistics and cluster error terms at the DHS cluster level (a village in rural areas; a city block in urban areas) to account for within-cluster correlation of the residuals.

Our identifying assumption in the DiD Equations is that, in the absence of the tassinon belief, the age- and menopause-dividend would be similar across voodoo and non-voodoo ethnicities. Any competing explanation should not merely have a level effect on female autonomy, but an effect that varies with age or menopause (Nizalova and Murtazashvili, 2016). A first argument in support of our identifying assumption is the exogeneity of age and the quasi-exogeneity of menopause. As such, menopause only weakly relates to a woman’s behavior, and in spheres that

are unlikely to matter in the African context, such as hormonal treatment and smoking (Bromberger et al., 1997; Meschia et al. 2000). We will further demonstrate this in the results section, by regressing menopause on a set of women's characteristics. Second, we will try to come up with a competing explanation according to which the age- and menopause-dividend varies across ethnic groups. In particular, we will systematically discuss specific characteristics of voodoo-related ethnic groups, besides the tassanon institution, that could affect women's autonomy and verify whether their salience depends on age or menopause, thus confounding the tassanon effect. Finally, in a placebo test, we consider women's years of education as an outcome variable. Schooling is determined early in life and should therefore not be affected by the tassanon effect. Reassuringly, none of our coefficient of interest is significant (results available on request).

5. Data

Our database is a compilation of the 9 DHS rounds collected throughout the period 1993-2014 in Benin (3 rounds), Ghana (3 rounds), Nigeria (2 rounds) and Togo (1 rounds), for which the information on women's autonomy in decision-making is complete. It encompasses information on 20,906 couples for which all variables of our econometric specification are available. Women in these couples are aged 15 to 49.

The DHS includes four questions on women's autonomy in decision making, which relate to the following areas: (1) the use of her own earnings, (2) care for her own health, (3) visits to family or relatives, and (4) major household purchases. Each question has six response options regarding decision-making: respondent alone, respondent and husband/partner, respondent and other person, husband/partner alone, someone else, and others. For each area of decision-making, we created a binary variable that takes the value 1 for the first three responses that indicate the woman's (full or partial) involvement in decision-making, and 0 for the other response options. We then use a simple sum of the four binary variables to construct an *autonomy index*, which is our main dependent variable.

One of our two main independent variables of interest, ‘Woman is of voodoo ethnicity’, takes the value 1 if the DHS respondent reported belonging to one of the four broad ethnic groups classified as voodoo-related: the Adja, Ewe, Fon, and Yoruba. It takes the value 0 otherwise, i.e. if the woman reported belonging to one of the 24 other ethnic groups mentioned in the DHS rounds. The second main independent variable of interest ‘Menopause’ is derived from the variable ‘v215’ (time since last menstrual period). The response options include the number of days/weeks/months since her last menstrual period and whether a woman is menopausal. In the latter case ‘Menopause’ is coded 1, and otherwise 0.

Table 1 provides summary statistics for our key variables: the average, the standard deviation, and the comparison in mean between voodoo related and non-voodoo related ethnicities. The control variables, used in our baseline and robustness checks, are summarized in Supplementary Appendix 2. The ethnic groups historically practicing voodoo - the Fon, Ewe, Adja and Yoruba - represent 31.46% of women in our analytical sample. On average, women are 31.48 years old. A total of 534 women (2.55%) are menopausal and 245 (1.17%) are both menopausal and voodoo related. Women from voodoo-ethnicities are on average more involved in decision making regarding the use of their earnings, health care sought, family visits and large purchases than other women. Their autonomy index stands at 2.91, compared to 2.37 for women of non-voodoo ethnicities. They also have a significantly larger BMI (23.96 vs 23.27).

With respect to the control variable ‘woman’s religion’ it is noteworthy that a large proportion of women in our sample self-report being Christian (52.05%), or Muslim (36.84%). Only 14.69% of women from voodoo-related ethnicities report adhering to ‘traditional religion’, compared to only 4.39% of non-voodoo related ethnicities. There is however considerable religious syncretism, which remains unobserved in the DHS data. Self-reported Christians or Muslims may at the same time adhere to voodoo customs, and several African Independent Churches are blending Christian traditions with voodoo-like rituals, miracles and charismatic healing (Barbier and Dorier-Apprill, 2002; Tall, 1995). This is confirmed in our qualitative research. For instance, a

tassinon explains: « *I am Christian, still I am the tassinon of family. I must respect the spiritual heritage of my ancestors, including the worship of asen. God is unique and is the same. Religions are all about peace, harmony and caring about people. I see no contradiction in being at the church early every morning and worshipping the hennu vodoun later that same day* » [T56].

[Table 1. about here]

Aside from comparing DHS variables across voodoo and non-voodoo related ethnic groups, we make a comparison of the groups' historical characteristics. We do so in order to assess whether – aside from the tassinon institution – the ethnic groups differ in other dimensions that could confound our results. The comparison is based on pre-industrial ethnographic data provided by Murdock (1967). Table 2 gives an overview of the matching between DHS ethnicities and Murdock ethnicities, and Figure 1 gives the historic location of the 20 DHS ethnicities, as derived from their ethnic homelands in Murdock's database.

[Figure 1. and Table 2. about here]

Table 3 shows the results of the comparison. The patrilineal descent system dominates both in voodoo related ethnicities and non-voodoo related ethnicities, and none of the ethnicities is purely matrilineal. In both cases, polygamy and extended families were the usual form of domestic organization. In present days, however, polygamy is significantly higher in voodoo-related ethnicities, conditional upon controlling for Islam, which dominates in the northern regions of the four case study countries. This could be a legacy of the slave trade (cf. below). Historically, voodoo related ethnicities were more likely to belong to formed states than the non-voodoo related ethnicities, which is consistent with the fact that the Fon, Adja and Ewe were historically part of the vast Dahomey kingdom and the Yoruba founded the Oyo empire. This also had its effect on

jurisdiction. While voodoo-related ethnicities had two to three levels of jurisdiction beyond the local community (village) level, there was no or just one level for more than half of non-voodoo ethnicities. Dependence on agriculture was somewhat lower in voodoo related ethnicities, but no single ethnicity relied on animal and plough cultivation. Table 3 lists also the distance from the center of the ethnic homeland to the coastline, which is 220 km shorter on average for voodoo-related ethnic groups, which explains why they were on average more exposed (with a factor of 10) to the slave trade than groups located further land inward (Nunn and Wantchekon, 2011). In the results section, we will test whether differences across voodoo and non-voodoo ethnicities could provide competing explanations for our results.

[Table 3. about here]

6. Results

Main results

The estimation results of Eq. 1 to Eq. 5 are pooled in Table 4. The results of Eq. 1 indicate that women gain autonomy as they become older. More precisely, one additional year in age is associated with an increase of 0.015 units of the AI. The estimation results of Eq. 2 show a significant additional age-dividend of 0.006 for women of voodoo-ethnicities. The estimation of Eq. 3 does not reveal a general menopause dividend. However, the estimated coefficient on the interaction term between menopause and voodoo-ethnicities in Eq. 4 reveals a ‘tassinon effect’, indicating that menopause does play a significant role for voodoo-ethnicities. The tassinon effect is significant (at 5%) and sizeable, estimated at 0.241, which is equivalent to the effect of an additional 8 years of education for the woman. The size of this coefficient decreases by about 30% when we add the interaction term *Woman age * Woman is of voodoo ethnicity* in Eq. 5. This suggests that the menopause-dividend in voodoo-cultures as estimated in Eq. 4 is a combination of a more general age-dividend (0.005) and a specific menopause effect (0.176). The first component could

be capturing, among others, a gradual transfer of autonomy to women in anticipation of their menopause status. The coefficient estimate of 0.176 on the second component remains sizeable. Its effect is equivalent to the effect of 6 additional years of education for the woman.

[Table 4. about here]

Having documented a differential effect of menopause on women's autonomy across voodoo and non-voodoo ethnicities, we now verify whether this *tassinon effect* can be extended to a material welfare outcome, namely women's BMI. Table 5 shows the results. The estimation results of Eq. 2, displayed in column 2, reveal a larger age-dividend for women of voodoo-related ethnicities. The estimation of Eq. 4 shows that these women also have a larger menopause-dividend, thus adding support for a *tassinon effect*. In particular, the coefficient estimate (1.106) indicates that voodoo-related women suffer much less the decline in BMI that comes with the menopause, and this difference is significant at 1%. The coefficient estimate remains positive and large (0.613) in Eq.5, but loses its significance.

[Table 5. about here]

Robustness checks

We perform twelve robustness test for our main results. They can be subdivided in five set of checks. Regarding women's autonomy, the results of robustness checks for Eq. 4 are condensed in Table 6, while the full results for both Eq. 4 and Eq. 5 can be consulted in Appendices 3 till 12. The summary of robustness checks for a woman's BMI can be consulted in Appendix 13.

In the first set of checks, we vary the estimation technique and modalities in three ways. First, to further verify the (non-)linearity of the age-dividend, we estimate Eq. 4 as a semi-parametric regression where woman's age enters the regression non-parametrically such that its

relationship with autonomy is derived from the data, rather than being imposed as linear (check 1). In addition, we run an ordered probit model (check 2). Finally, we cluster the standard errors at higher levels than the DHS cluster, namely at the administrative region (check 3) and at the level of women's ethnicity (check 4).

In a second set of checks, we measure 'voodoo-related' differently. First, acknowledging that self-reported 'voodoo ethnicity' is a rather crude binary variables, we instrument for it using a continuous predictor, namely the nearest distance to Abomey or Oyo, the capital cities of the Dahomey and Oyo kingdoms (check 5). As explained in the Background section, it is the interaction between these two kingdoms that gave way to the 'new' supra-clan Voodoo religion. Next, instead of using self-reported ethnicity from the DHS data, we identify 'voodoo-related' by the location of a respondent in the historical homelands of the four Voodoo-ethnicities (88.71% of women living in these homelands are of voodoo-ethnicity) (check 6). Finally, instead of defining the variable at the level of the woman, we define a corresponding variable at the couple level, that takes 1 if both husband and wife are of a voodoo-related ethnicity (check 7).^{xii}

In set three, we modify the definition of our second main independent variable of interest, 'menopause'. In particular, we account for potential measurement error in the answer category 'menopause' by extending the group of menopausal women derived from the DHS variable v215 to women over 40 with no menstrual period since at least one year at the time of the survey (check 8). We exclude women who are, or recently were, pregnant. Conversely, we restrict the group of menopausal women. In particular, we sequentially exclude all menopausal women of age less than 40 (which correspond to 43 observations) (check 9) and less than 45 (average age of menopausal women in the sample, which correspond to 178 observations) (check 10). Doing so may address erroneous data entries, but also purposefully misreporting of menopause by women.^{xiii}

Fourthly, we vary the definition of our main outcome variable. Instead of using the simple sum of autonomy in four different spheres, we use the (normalized) first principal component (PCA) of the four separate variables on decision-making (check 11).

In a final check, we add additional control variables (check 12). In particular, we add controls that are potentially endogenous, thus adopting the additional exogeneity conditions described in Lechner (2008, p.6-9). To the vector of woman-level characteristics X_{hw} , we add a woman's weight, an indicator variable for her occupation, her age at first marriage, the total number of births given by her and the number of her children who have died. To the set of household level characteristics X_h , we add the number of the household head's other wives and the number of under-five year old children in the household.

The results show that the tassion effect, i.e. the estimated coefficient on *Menopause_{hw} * Woman is of voodoo ethnicity*, remains stable across all robustness checks of Eq. 4. For the more extensive Eq. 5, the tassion effect is no longer significant when a woman's age enters the regression non-parametrically. However, the results of our semi-parametric estimation (Robustness check 1 reported in Appendix 3) reveal that the relationship between a woman's age and autonomy index is very close to linear. Since the precision of estimators which impose only nonparametric restrictions is often poorer (Powell, 1994), our most efficient and therefore preferred estimation remains the baseline one. The tassion effect also loses significance when *Couple is of Voodoo ethnicity* is used to capture 'voodoo-related' (probably because part of the tassion effect moves to the counterfactual group with menopausal women of voodoo ethnicity married to husbands of non-voodoo ethnicity) and when excluding all menopausal women of age less than 45 from the analysis (probably because of fewer observations on menopausal women)

[Table 6. about here]

Competing explanations

Our identifying assumption underlying the DiD estimation is the parallel trends assumption that - in the absence of the tassion belief - the age- and menopause-dividend would be similar across voodoo and non-voodoo ethnicities.

To defend this assumption, we rely first of all on the fact that menopause is a normal concomitant of ageing in all women (World Health Organization, 1996) and is outside the control

of the individual. According to Bromberger et al. (1997) and Meschia et al. (2000), only its timing weakly relates to behavior. In Appendix 14, we present estimates of the determinants of menopause using all women in our sample (Col. I and III) and the sub-sample of women of 40 years and older (Col. II and IV). Compared to the first two columns, Col. III and IV are based on a sub-sample of women for which additional variables capturing health conditions are available, in particular a woman's anemia status. Overall, age (0.011***), age at first marriage (-0.006***), and number of births given (-0.013***) are the main predictors of menopause. Age at first marriage most likely captures the effect of age at first menstruation which is positively correlated with the menopause age but goes unrecorded in the DHS (Meschia et al. 2000). As regards the negative estimate on the number of births, it may be a consequence as well as a determinant of the timing of menopause but its effect remains debated (Meschia et al. 2000). In Col. I and Col. II certain other women's characteristics are significant, e.g. type of economic activity and education, but the significance disappears in Col. III and IV. In any case, woman's education is included in our baseline specification and our twelfth robustness check accounts for woman's activity.

Secondly, our identifying assumption supposes that, aside from the tassinon institution, there is no other ethnicity-level difference that could explain the menopause-dividend. While Table 3 indicated that there are differences between voodoo- and non-voodoo related ethnicities, in terms of geographic location and social organization, it is hard to imagine how such differences could give way to a menopause-dividend. Since, upon menopause, a woman no longer is fertile, and can therefore not give birth to an out-of-wedlock child, we searched for differences in the treatment and cost of such children across ethnicities. But neither our qualitative field work nor a search of the literature, revealed such differences.

One potentially competing explanation could relate to menstrual taboos, that may constrain activities of younger women. The lifting of such taboos could then lead to 'a menopause-dividend'. However, while an exploration of the topic of menstrual taboos in our qualitative field work and the ethnographic literature did reveal the existence of such taboos^{xiv}, there is no indication that

such taboos are more prominent among voodoo ethnicities than among the other ethnic groups. To further rule out this explanation, consider Figure 2, in which the autonomy index is plotted against age. The dashed line shows the relationship for non-voodoo women; the solid line that for women of voodoo-related ethnicities. Both lines reveal that on average women gain autonomy with age. But, the patterns also clearly show that, even at young ages, women of voodoo-ethnicities have much higher autonomy than their counterparts in non-voodoo ethnicities, making it less likely that their autonomy is crushed by disproportionately strict menstrual taboos.

[Figure 2. about here]

Another potentially confounding factor is Islam, which is often associated with earlier marriage and lower female autonomy and mobility, and is less practiced among the more southern located voodoo ethnicities than among the more northern non-voodoo ethnicities (-29.45 percentage points). Hence, we add a variable capturing intensity of Islam (defined as the percentage of Muslims in the cluster of residence) together with its interaction $Menopause_{hw} * Intensity\ of\ Islam_{hw}$ in Eq.4 and Eq.5. As shown in Appendix 15, the coefficient on the interaction term $Menopause_{hw} * Woman\ is\ of\ voodoo\ ethnicity_{hw}$ remains stable for Eq. 4 but loses significance for Eq.5 (sizeable coefficient with a p-value of 0.128). The interaction term $Woman\ age_{hw} * Woman\ is\ of\ voodoo\ ethnicity_{hw}$ remains significant at 5%.

In theory, the prevalence of polygamy could be another potential confounding factor. Indeed, one could argue that seniority is especially important in polygamous organizations, as elderly co-wives usually enjoy a higher status than younger co-wives. As polygamy is significantly higher in voodoo-related ethnicities (conditional upon controlling for Islam), it could thus violate our parallel trends assumption, be it only in Eq. 4; not in Eq. 5 where we control for the interaction between age and ethnic group. To verify this quantitatively, we add the interaction term $Menopause_{hw} * Polygamy_{hw}$ to Eq. 4 and Eq. 5. The results, given in Appendix 16, show that our results remains stable for Eq. 4. In the case of the more demanding Eq. 5, the tassion effect remains sizeable and is close to significant with a p-value of 0.105.

A different sort of threat to the identifying assumption may stem from sample selection bias. This is because our analysis is based on women in couple, and the probability of remaining in couple may depend on characteristics that also affect our outcome variable, and that vary across ethnic groups. Put simply: for reasons we ignore, highly autonomous women who enter menopause may have a higher probability to divorce in non-voodoo groups compared to such women in voodoo related groups. In this case, our results could be driven by a selection effect, i.e. among voodoo-ethnicities it are the more autonomous women who stay married after menopause, while among non-voodoo ethnicities, these women become single and thus unobserved in our sample. But again, while one can easily come up with characteristics that co-determine autonomy and the probability to divorce (e.g. women's earning opportunities outside the household), it is difficult to imagine confounding factors that are at the same time related to the heterogeneity of the menopause-dividend across ethnicities. Besides, an analysis of divorce rates shows that menopause does not affect the probability of remaining married and there is no cross-cultural difference in divorce rates, neither in the sample of women of 40 years and older nor in the subsample of menopausal women (see Appendix 17).

Finally, countries may provide different institutional environments for older women, e.g. in the form of inheritance or pension laws. And, voodoo-ethnicities are not equally divided across the four case study countries (see Appendix 2). To account for this, we add interaction terms between country fixed effects and a woman's age and menopause status. We still find a positive, sizeable and significant *tassinon* effect both in Eq.4 and Eq.5 (see Appendix 18).

*Heterogeneity of the *tassinon* effect*

To uncover which of the four decision spheres are driving our result, we decompose the autonomy index into its four separate components: the use of a woman's own earnings, her health care seeking, visits to family or relatives, and large household purchases. In addition, we distinguish between full and partial autonomy in each of these spheres. Full autonomy is an indicator variable

that takes 1 if a woman reports deciding alone and 0 otherwise, whereas partial autonomy takes 1 in case the respondent decides with her husband/partner and 0 otherwise.

Consistent with the fact that couples in West-Africa have separate budgets, 68.34% of women in our sample have full command over the use of their own earnings, while only 21.02% decide together with husbands on how to use their earnings. However, not many women enjoy full autonomy regarding decisions for care sought for themselves (13.20%), visits to family members (12.32%) and large household purchases (9.11%). Here partial autonomy accounts for larger proportions, at 39.02%, 50.90%, and 39.29%, respectively.

Looking at the regression result in Table 7, we find no significant tassinson effect on women's full autonomy (Panel I) while the tassinson effect is positive and significant for women's partial autonomy, notably in care sought (0.092) and large purchases (0.149) (Panel II). Therefore, the overall tassinson effect documented in this study stems mostly from partial autonomy, in these two spheres.

[Table 7. about here]

In addition, we look at the cross-country variation of the tassinson effect. As voodoo originates from Benin, we expect to find a larger tassinson effect in this country. Appendix 19 reveals that the menopause dividend in voodoo-related ethnicities is positive in all four countries but only significant in Benin (0.325). The statistical insignificance of the tassinson effect in Ghana and Nigeria likely stems from a lower share of women of voodoo ethnicities (respectively 13.40% and 18.31% compared to 71.00% in Benin). For Togo, it is the overall smaller sample size (1,473 women in total) that lowers the probability to detect a significant effect.

Lastly, as traditional beliefs and social norms may fade away in urban areas, we explore heterogeneity across urban and rural areas, anticipating the tassinson effect to be lesser in urban settings. In contrast, results reported in Appendix 20 suggest that there is no significant difference between urban and rural settings.

7. Mechanisms

This section tentatively explores the underlying mechanisms of the tassanon effect. In the background section, we argued that tassanons are both feared and respected, and enjoy a special status both in the family and the larger community, and this special status may extend to all menopausal women of voodoo-ethnicities. The results of our quantitative analysis indeed reveal that, for those ethnic groups, menopause was associated with greater women's autonomy in household decision-making. We investigate two specific channels that could explain such increased autonomy: the 'income factor' and the 'fear factor'.

Income factor

We hypothesize that the menopausal woman acquires, through her higher status and particular role in the community, greater access to income-increasing opportunities, e.g. through a larger social network or because people reward the tassanon and her assistants for their (ceremonial) services. According to conventional intra-household models (e.g. Basu, 2006; Browning et al, 1994) the higher income, in its turn, could affect the woman's threat point in intra-household bargaining. This could be true also in our specific case, as the tassanon status is not affected by divorce. To tentatively test for this channel, we add a dummy variable to Eq. 4 capturing whether a woman earns the same or more money than her husband.^{xv} Results in Table 8 (Col. II) show that earning the same or more money than her husband significantly (at 1%) and sizably increases a woman's autonomy index (0.410). However, our coefficient of interest that measures the tassanon effect is only marginally affected by the inclusion of this variable, more specifically with a slight decline of the tassanon effect by -4.07 per cent. Furthermore, our results remain similar when including the interaction term of menopause status with the dummy variable capturing whether a woman earns the same or more money than her husband (Col. III of Table 8). Hence, while the income effect clearly is important for intra-household bargaining, it seems to operate largely independently from the tassanon effect.

[Table 8. about here]

Fear factor

We hypothesize that a husband considers his menopausal spouse more highly because of her alleged supernatural powers, and therefore grants her with more decision autonomy. This channel is conditional on the husband's belief in human agency in the harnessing of supernatural powers. The DHS survey includes one question that provides us with a proxy of such belief, i.e. whether "HIV can be transmitted by witchcraft or supernatural means". The answer categories are: 'no', 'yes' and 'don't know'. A direct comparison of the tassinon effect across subsamples of women whose husbands believe AIDS can be caused by witchcraft and women whose husband do not believe so, would be plagued by selection bias. For instance, in our sample we find that those who believe HIV can be transmitted by witchcraft are less educated, tend to live more in rural areas, and are less wealthy. To overcome this caveat, we first pair-matched women whose husbands believe AIDS can be caused by witchcraft to their counterparts (women whose husbands do not believe so), based on a propensity score obtained from a probit regression (Appendix 21). In particular, we construct two subsamples that are comparable as much as possible based on observable characteristics, the only observable difference being the husband's belief. The propensity score is based on variables that likely affect women autonomy (including among others woman's age and education) as well as factors that may be correlated with witchcraft beliefs (e.g. the percentage of husbands practicing traditional religion in the village or city block) with the aim to reduce as much as possible group differences in these variables so that the difference in our coefficient of interest can be attributed to a difference in what the husband believes (see details in Appendix 21). Doing so provides us with the following two samples: (i) a sample of 5,924 women with non-believing husbands, and (ii) an equal-size sample of women with either believing husbands (3,817 women) or with husband not quite sure HIV can be transmitted by witchcraft or supernatural means (2,107). Results in Table 9 indicate a significant and sizeable tassinon effect in

the second sample only (and an even greater effect if only the 3,817 ‘believing’ husbands are considered). In so far the two samples indeed have similar characteristics and only differ in the husband’s belief about whether HIV can be transmitted by witchcraft or supernatural means, this result provides tentative evidence for the ‘fear factor’. We can however not rule out that alternative unobserved factors associated with the witchcraft belief might drive this result.

[Table 9. about here]

8. Conclusion

This study relies on several rounds of DHS surveys, and a Difference-in-Differences estimation strategy to explore the interrelation between women’s autonomy, menopause and magicoreligious beliefs. Our results reveal that women of voodoo-related ethnicities gain decision power upon menopause, and have a higher BMI compared to menopausal women of other ethnicities. Regarding the channels, both our qualitative field work and quantitative analysis suggest that this voodoo-related menopause-dividend is driven by magicoreligious beliefs in the supernatural powers of the tassinon.

This result entails four main contributions. First, it provides to the best of our knowledge the first quantitative support for the argument forwarded in the African feminist literature, that – in terms of status – seniority trumps gender in an African context. Second, our analysis adds to the fast growing body of studies that demonstrate the persistence of precolonial institutions and their impact on development outcomes in SSA. Third, our results add to the body of both ethnographic and quantitative studies that argue that magicoreligious beliefs continue to play a tangible role in many African societies. While it is well documented that elderly women are often the victim of such magicoreligious beliefs (in the form of witchcraft accusation), we are the first to make explicit the positive side of the medal for women. Finally, our findings may be of interest to those theorizing about intra-household bargaining, as none of the models so far have taken into account

the possibility that the threat point in the bargaining game may be affected by magicoreligious beliefs.

Transversally, across these contributions, is our focus on elderly African women. While innumerable economic studies have looked at women of reproductive age, very little attention has gone to elderly women in SSA. Exceptions include Duflo (2003) and Edmonds (2006) who study the impact of pension schemes in South-Africa, and the witchcraft study by Miguel (2005). Given the demographic evolution in SSA, a better understanding of cultural attitudes towards elderly African women will become more important for policymakers in the future; as fertility declines and life expectancy increases, elderly women will increase in numbers, both in absolute and relative terms. For instance in Benin, a plan for active aging is implemented to provide various support to the elderly with a specific focus on women (Ministère de la Famille, des Affaires Sociales, de la Solidarité Nationale, des Handicapés et des Personnes de Troisième Age). Also in Benin, the respect for elderly women is already relied upon in interventions targeting children's health and nutrition, and in the abolishment of female genital cutting, but this could be reinforced and extended to other sectors.

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Figures

Figure 1. Historical location of DHS ethnicities

Note.— This figure shows the historical location of the ethnicities in our DHS sample, as derived from the ethnic homelands in Murdock's database.

Figure 2. Average women's autonomy index and estimated marginal effect of age on women's autonomy

Panel A : Average of women's autonomy index with respect to age and relation to voodoo

Panel B: Estimated marginal effect of age on women's autonomy across voodoo and non-voodoo ethnicities

Note : The autonomy index is the simple sum of indicator variables that measure women's autonomy in the following four decision areas: (1) the use of her own earnings, (2) care for her own health, (3) visits to family or relatives, and (4) major household purchases. Panel B shows the estimated coefficients on the complete set of indicator variables for a woman's age, when used as regressors to explain the AI. The control variables are as specified in Eq. 4: couple- and woman-level characteristics (age difference between the woman and her partner, the woman's education, religion and height), husband-level characteristics (his education and an indicator variable for whether he lives together with the woman), household-level characteristics (residence area, wealth quintile) and indicator variables for the administrative region of the household and for year in which the DHS survey took place. Standard errors are clustered at the DHS-cluster level.

Tables

Table 1. Sample means and proportions of key variables

Variables	Mean/Proportion	St. Dev	Woman is not		Difference (I)-(II)
			Woman is of voodoo ethnicity (I)	of voodoo ethnicity (II)	
Woman is of voodoo ethnicity	31.46	-	-	-	-
Woman's age	31.48	7.70	32.19	31.16	1.03***
Woman is menopausal	2.55	-	3.72	2.01	1.71***
Menopausal * Voodoo ethnicity	1.17	-	-	-	-
Woman's autonomy in decision making:					
<i>Use of earnings</i>	<i>89.86</i>	-	<i>93.60</i>	<i>88.28</i>	<i>5.32***</i>
<i>Seek for health care</i>	<i>52.21</i>	-	<i>61.84</i>	<i>47.79</i>	<i>14.05***</i>
<i>Visit to family</i>	<i>63.23</i>	-	<i>75.95</i>	<i>57.38</i>	<i>18.57***</i>
<i>Large purchases</i>	<i>48.41</i>	-	<i>59.14</i>	<i>43.48</i>	<i>15.66***</i>
<i>Autonomy Index</i>	<i>2.54</i>	<i>1.34</i>	<i>2.91</i>	<i>2.37</i>	<i>0.54***</i>
Woman's BMI	23.55	4.66	23.96	23.27	0.69***
Number of observations	20,906		6,578	14,328	

Source : Authors, based on data from 9 DHS rounds collected throughout the period 1993-2014 in Benin (3 rounds), Ghana (3 rounds), Nigeria (2 rounds) and Togo (1 round) and for which the information on women's autonomy in decision-making is complete.

Table 2. Classification of DHS ethnicities and corresponding Murdock classification according to voodoo affiliation

Voodoo ethnicities		Non voodoo ethnicities	
DHS	Murdock classification	DHS	Murdock classification
Adja	Fon	Akan	Ashanti
Ewe	Ewe	Akposso/akebou	
Fon	Fon	Ana-ife	Ife
Yoruba	Yoruba	Bariba	Bargu
		Betamaribe	Somba
		Dendi	Dendi
		Ekoi	Ekoi
		Fulani	Bauchi
		Ga/dangme	Ga
		Grusi	Dagomba
		Guan	Dagomba
		Gurma	Dagomba
		Hausa	Hausa
		Ibibio	Ibibio
		Igala	Igala
		Igbo	Ibo
		Ijaw/ izon	Ijaw
		Kabye/tem	Tem
		Kanuri/ beriberi	Kanuri
		Mole-dagbani	Dagomba
		Para-gourma/akan	Dagomba
		Peuhl	Bargu
		Tiv	Tiv
		Yoa	Somba
N = 4	N=3	N = 24	N=17

Source: Authors, based on Murdock's classification and ethnicities in our DHS sample. We matched the ethnicities mentioned in the DHS with those named in Murdock's database, relying on the correspondence tables of the Ethnic Power Relations (EPR) database (Wimmer et al. 2009) and Nunn and Wantchekon (2011). We could match 27 DHS ethnicities (out of the 28) with 20 ethnicities in Murdock's classification of ethnicities. We end up with three instead of four voodoo-ethnicities, because in Murdock's classification, Adja and Fon are grouped together as Fon, while Ewe and Yoruba ethnicities are considered separately. Only 1 ethnicity specified in the DHS data (namely Akposso/ Akebou, representing 0.14% of our sample) could not be matched.

Table 3. Comparison of historical characteristics across the voodoo and non-voodoo ethnicities

	Voodoo ethnicities	Non voodoo ethnicities
	N= 3	N=17
<i>Dependence on agriculture</i>		
36-45% dependence	0	1
46-55% dependence	1	2
56-65% dependence	1	1
66-75% dependence	0	5
76-85% dependence	1	1
86-100% dependence	0	2
Missing	0	5
<i>Animal and plough cultivation</i>		
Absent	3	12
Missing	0	5
<i>Jurisdictional hierarchy beyond the local community</i>		
No levels	0	3
One levels	0	3
Two levels	1	4
Three levels	2	2
Missing	0	5
<i>Political integration</i>		
Insufficient information	1	10
Minimal states	0	1
States	2	1
Missing	0	5
<i>Type of society</i>		
Patrilineal	2	8
Duolateral	0	2
Ambilineal	0	1
Mixed	1	1
Missing	0	5
<i>Polygamy</i>		
Polygynous: unusual co-wives	0	1
Polygynous: usual co-wives	1	1

Small extended families	0	3
Large extended families	2	7
Missing	0	5
<i>Average distance to coastal line (in Km)</i>	108	330
<i>Average slave exports (in percentage of historical population)</i>	0.709	0.079

Source : Authors, based on Murdock's classification, Nunn and Wantchekon (2011) and a distance calculation in ArcGIS. Only the categories with non-zero values are displayed.

Table 4. Cross-cultural heterogeneity in the effect of age and menopause on women's autonomy

	DEPENDENT VARIABLE : AUTONOMY INDEX				
	(I)	(II)	(III)	(IV)	(V)
Woman age	0.015*** (0.001)	0.013*** (0.001)	0.015*** (0.001)	0.015*** (0.001)	0.014*** (0.002)
Woman is menopausal			0.032 (0.053)	-0.080 (0.071)	-0.061 (0.071)
Woman is of voodoo ethnicity		-0.042 (0.097)		0.154*** (0.047)	-0.006 (0.100)
Woman age * Woman is of voodoo ethnicity		0.006*** (0.002)			0.005* (0.003)
Woman is menopausal * Woman is of voodoo ethnicity				0.241** (0.100)	0.176* (0.105)
Controls variables as in Eq.4	YES	YES	YES	YES	YES
Clusters	4,625	4,625	4,625	4,625	4,625
Observations	20,906	20,906	20,906	20,906	20,906
R-squared	0.219	0.220	0.219	0.220	0.220

*** p<0.01, ** p<0.05, * p<0.1

Note.— The sample includes women, aged 15-49, in couple. Control variables include woman-level characteristics (education, religion and height), husband-level characteristics (education and an indicator variable for whether he lives together with the woman), the age difference between the spouses, household-level characteristics (urban/rural residence, wealth quintile), and indicator variables for the administrative region of residence of the household and for the year in which the DHS survey took place. Standard errors are clustered at the DHS-cluster level and reported in parentheses.

Table 5. Cross-cultural heterogeneity in the effect of menopause on women's body mass index

	DEPENDENT VARIABLE : WOMEN' BODY MASS INDEX				
	(I)	(II)	(III)	(IV)	(V)
Woman age	0.112*** (0.005)	0.099*** (0.006)	0.117*** (0.005)	0.117*** (0.005)	0.105*** (0.006)
Woman is menopausal			-0.713*** (0.214)	-1.209*** (0.262)	-1.064*** (0.265)
Woman is of voodoo ethnicity		-1.571*** (0.358)		-0.198 (0.158)	-1.546*** (0.370)
Woman age * Woman is of voodoo ethnicity		0.042*** (0.010)			0.041*** (0.011)
Woman is menopausal * Woman is of voodoo ethnicity				1.106*** (0.415)	0.613 (0.440)
Controls variables as in Eq.4	YES	YES	YES	YES	YES
Clusters	4,386	4,386	4,386	4,386	4,386
Observations	15,036	15,036	15,036	15,036	15,036
R-squared	0.215	0.216	0.216	0.216	0.217

*** p<0.01, ** p<0.05, * p<0.1

Note.— The sample includes women, aged 15-49, in couple. We exclude women that are pregnant or have given birth in the last 6 months at the time of the survey. Control variables are as specified in the note of Table 4, with the exception of a woman's height (which is part of the BMI calculation). Standard errors are clustered at the DHS-cluster level and reported in parentheses.

Table 6. Summary of robustness checks for Eq. 4

	DEPENDENT VARIABLE : AUTONOMY INDEX											
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)	(XI)	(XII)
Woman is of voodoo ethnicity †	0.152*** (0.047)	0.143*** (0.044)	0.154* (0.075)	0.154** (0.072)	0.285*** (0.078)	0.488*** (0.098)	0.177*** (0.048)	0.154*** (0.047)	0.155*** (0.047)	0.155*** (0.047)	0.113*** (0.034)	0.157*** (0.047)
Woman is menopausal *												
Woman is of voodoo ethnicity ††	0.243** (0.100)	0.248** (0.102)	0.241*** (0.074)	0.241*** (0.074)	0.268** (0.123)	0.266*** (0.100)	0.203** (0.101)	0.222** (0.091)	0.272*** (0.105)	0.250** (0.125)	0.182** (0.074)	0.233** (0.100)
Controls as in baseline Eq. 4	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Robustness checks												
(1) Non parametric relationship between AI and Woman Age	YES											
(2) Ordered probit specification		YES										
(3) SE clustered at administrative region level			YES									
(4) SE clustered at woman ethnicity level				YES								
(5) Instrumented 'Voodoo-related'					YES							
(6) 'Voodoo-homelands'						YES						
(7) Voodoo ethnicity defined at couple level							YES					
(8) Alternative definition of menopause 1								YES				
(9) Alternative definition of menopause 2									YES			

(10) <i>Alternative definition of menopause</i> ³	YES											
(11) <i>AI defined based on PCA</i>	YES											
(12) <i>Endogenous controls</i>	YES											
<i>Clusters</i>	4,625	4,625	28	34	4,297	4,625	4,625	4,625	4,623	4,618	4,625	4,615
<i>Observations</i>	20,906	20,906	20,906	20,906	17,883	20,906	20,906	20,906	20,863	20,728	20,906	20,736
<i>R-squared</i>	0.192		0.220	0.220	0.244	0.219	0.220	0.220	0.220	0.219	0.229	0.224

*** p<0.01, ** p<0.05, * p<0.1

Note.— Detailed results of robustness checks are reported in Appendix 3 to 12.

[†] and ^{††} : In Col. (VI) , ‘Woman is of voodoo ethnicity’ is replaced by ‘Woman lives in voodoo homeland’ while in Col. (VII) , ‘Woman is of voodoo ethnicity’ is replaced by ‘Couple is of voodoo ethnicity’, so both husband and wife.

Table 7. Full and partial autonomy for the four different autonomy spheres, Eq. 4

	DEPENDENT VARIABLES			
	Use of earnings (I)	Seeking health care (II)	Visit family (III)	Large purchases (IV)
FULL AUTONOMY				
Woman is menopausal * Woman is of voodoo ethnicity	-0.004 (0.037)	-0.011 (0.037)	-0.021 (0.034)	0.017 (0.032)
<i>Controls variables as in Eq.4</i>	YES	YES	YES	YES
<i>Clusters</i>	4,625	4,625	4,625	4,625
<i>Observations</i>	20,906	20,906	20,906	20,906
<i>R-squared</i>	0.148	0.078	0.062	0.051
PARTIAL AUTONOMY				
Woman is menopausal * Woman is of voodoo ethnicity	0.039 (0.076)	0.092* (0.047)	0.059 (0.041)	0.149*** (0.045)
<i>Controls variables as in Eq.4</i>	YES	YES	YES	YES
<i>Clusters</i>	2,822	4,460	4,484	4,524
<i>Observations</i>	6,494	18,147	18,330	19,001
<i>R-squared</i>	0.136	0.174	0.186	0.177

*** p<0.01, ** p<0.05, * p<0.1

Note.— The sample includes women, aged 15-49, in couple. The independent variables are as in Table 4. Standard errors are clustered at the DHS-cluster level and reported in parentheses.

Table 8. Transmission channel: income factor ?

	DEPENDENT VARIABLE: AUTONOMY INDEX		
	(I)	(II)	(III)
Woman is menopausal* Woman is of	0.221*	0.212*	0.210*
voodoo ethnicity	(0.123)	(0.121)	(0.121)
Woman earns same or more than husband		0.410*** (0.031)	0.408*** (0.031)
Menopause * Woman earns same or more than husband			0.064 (0.151)
Controls variables as in Eq.4	YES	YES	YES
Clusters	3,335	3,335	3,335
Observations	15,631	15,631	15,631
R-squared	0.254	0.264	0.264

*** p<0.01, ** p<0.05, * p<0.1

Note.— The sample includes women, aged 15-49, in couple. The remaining independent variables are as in Table 4. Standard errors are clustered at the DHS-cluster level and reported in parentheses.

Table 9. Transmission channel: fear factor ?

	DEPENDENT VARIABLE : AUTONOMY INDEX		
	(I) do not believe	(II) believes or uncertain	(III) believes
PANEL A : FULL SAMPLE			
Woman is menopausal* Woman is of voodoo ethnicity	0.103 (0.166)	0.706*** (0.190)	0.570*** (0.185)
<i>Clusters</i>	<i>2,931</i>	<i>2,148</i>	<i>2,806</i>
<i>Observations</i>	<i>5,924</i>	<i>3,817</i>	<i>5,924</i>
<i>R-squared</i>	<i>0.215</i>	<i>0.155</i>	<i>0.185</i>
PANEL B : ONLY VOODOO RELATED ETHNIC GROUPS			
Woman is menopausal* Woman is of voodoo ethnicity	0.036 (0.125)	0.409*** (0.133)	0.247* (0.132)
<i>Controls variables as in Eq.4</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
<i>Clusters</i>	<i>1,020</i>	<i>744</i>	<i>980</i>
<i>Observations</i>	<i>1,802</i>	<i>1,177</i>	<i>1,746</i>
<i>R-squared</i>	<i>0.086</i>	<i>0.111</i>	<i>0.089</i>

*** p<0.01, ** p<0.05, * p<0.1

Note.— The sample includes women, aged 15-49, in couple. The independent variables are as in Table 4. Standard errors are clustered at the DHS-cluster level and reported in parentheses. To avoid selection bias issues in our comparison, the subsample in Col. (I) comprises couples in which the husband does not believe HIV can be transmitted by witchcraft or supernatural means, that are matched to couples in which the husband does or is uncertain in Col. (III). The matching is based on a propensity score obtained from a probit regression of the likelihood to believe HIV can be transmitted by witchcraft or supernatural means. In Col. (II), we only consider couples in which the husband firmly believes HIV can be transmitted by witchcraft or supernatural means (see Appendix 21 for detailed results of the probit regression).

(a) Here the tassion effect equals the menopause effect.

ⁱ <http://www.un.org/sustainabledevelopment/gender-equality/>, last consulted: 2 June 2017.

ⁱⁱ Throughout the paper, we use the terms ‘supernatural’ and ‘magicoreligious’. While supernatural beliefs refer to beliefs in anything beyond the visible observable universe, including the belief in God or gods, magicoreligious beliefs are more specific as they refer to magical practices by humans intended to cause a supernatural being to produce or prevent a specific result.

ⁱⁱⁱ Within the universe of ambiguous invisible forces that characterizes African cosmology, the term ‘witchcraft’ is generally used as a catch-all phrase for the manipulation of negative forces (Geschiere, 2013). While widely used and understood in this way in everyday life, the term remains nevertheless controversial. According to Geschiere (2011, p. 233) “‘Witchcraft’ (like ‘sorcery,’ ‘magic,’ ‘sorcellerie,’ etc.) is a precarious translation – especially because of the pejorative implications of this Western notion – of African terms that often have much broader implications and might therefore be better translated by a more neutral term like ‘occult force’ or even ‘special kind of energy.’” In this paper, we refer to the more general and neutral ‘magicoreligious beliefs’ (see also the previous endnote).

^{iv} Authors’ translation from French.

^v The Greek Orthodox Church upholds the taboo against menstruating women receiving Communion, while this taboo was abolished in the Roman Catholic Church in the year 597 (Wood, 1981: 713-714, cited in Buckley and Gottlieb, 1988, p. 258). In Islam, Verse 222 of Sourate Al-Baqarah states the following about menstruation: “*It is a state of impurity; so keep away from women in the state of menstruation, and do not approach them until they are cleansed.*” According to the Sunnah, menstruous women should not pray, should not perform the Tawaf around the Ka'bah during the Hajj, and should not fast during Ramadan.

^{vi} The name ‘*tassinon*’ is used in the Fon, Adja and Ewe languages (Benin, Togo and Ghana), *Tangninon* is used in Goun (Benin) and *Iya Alatche* in Yoruba language (Nigeria and south-eastern Benin).

^{vii} The oracle transmits the messages of Mawu (the supreme being in voodoo) through 256 figures that are obtained either by manipulating sixteen palm nuts or by the toss of a chain of eight half seed shells. Whenever one of the 256 figures manifests itself, the associated verses are cited by the diviner (Bascom, 1941 Médiouhouan, 1993). The revealed figures are given to the client on a piece of paper or calabash which allows double-checking the interpretation (Tall, 1990). The rigid set of rules for interpretation, and the possibility to cross-check, reduce the scope for manipulation or subjectivity (Bascom, 1991; Tall, 1990). The message transmitted through Fâ is not up for dispute because it “derives from the gods and is controlled by the gods” (Bascom, 1941, p. 44).

^{viii} All extended family members may also witness the ceremony or otherwise ask for the revealed sign afterwards (narratives from our qualitative fieldwork). In very exceptional cases the oracle chooses a non-menopausal woman (for instance when there is no menopausal woman in the extended family). In that case, it is strictly forbidden for the tassinon to perform the rituals during her menstrual period.

^{ix} The localities were chosen based on the principle of attaining maximum variation across the urban-rural divide as well as across the four main ethnic groups that practice(d) voodoo. The first zone included Abomey, which is the capital of the former Dahomey kingdom, as well as two close rural localities, i.e. Cove and Zagnanando. Abomey as well as the surrounding area is dominated by Fon. The second zone was made up of Benin's main city, Cotonou, and the neighboring urban area of Abomey-Calavi. The third zone consisted of the historic slave port city Ouidah, where the voodoo cult is considered especially vibrant, and parts of its rural commune Kpomasse. The fourth zone included the capital city Porto-Novo, and proximate rural sites Avrankou and Dangbo in the South-East of the country. The fifth zone covered the South-West, including Lokossa, Se, Athieme, Dogbo, which are home to the Adja and Ewe ethnicities. Finally, Ketou, Sakete and Pobe were included as the historic homelands of the Yoruba in Benin.

^x For each survey round, interviewed households are divided into five wealth quintiles based on their wealth index. The wealth index is calculated using principal components analysis on easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities (DHS, 2013 2013, Standard Recode Manual for DHS 6).

^{xi} The region of residence is country specific and generated as follows: (country code x 1000) + region code in the country.

^{xii} To take into account the possibility that the strength of present-day voodoo beliefs varies across the four voodoo-ethnicities, we replace the dummy variable 'Woman is of voodoo ethnicity' by the ethnicity-level percentage of traditional religion adherents. In doing so, the tassinon effect is significant at 10% for Eq.4 but loses significance for Eq.5, while the interaction term Woman age * Ethnicity-level percentage of traditional religion adherents is significant at 1%. Note that due to the high level of syncretism in the region (Barbier and Drier-Apprill, 2002; Tall, 1995), the religious adherence constitutes a very imperfect proxy for a respondent's actual beliefs.

^{xiii} If menopausal women acquire a higher status, women may have an incentive to misreport menopause. This is a theoretical possibility: the menopause is a very private matter and there is no observable signal at the community level for the transition to menopause, except that women beyond a certain age and who have not born a child for a relatively long period are considered to be menopausal (based on qualitative fieldwork). However, in practice we do not expect women to 'fake menopause'. First, the designation of the 'tassinon' of the family by the Fâ is a public event, and

menopausal women wear specific cloths during ceremonies. Second, respondent made clear that it is very unlikely for a woman to fake her menopause as she might be asked to help during voodoo ceremonies and therefore expose herself and her family to the wrath of family deities if she approaches them while not being actually menopausal.

^{xiv} Examples are menstrual taboos already mentioned in footnote 4 for Muslims. In general, there are no such taboos for (non-orthodox) Christians. In voodoo, menopausal women should not enter in voodoo temples, or perform voodoo rituals nor have sexual intercourse. In case they are married to a voodoo priest, they additionally cannot cook for him in that period (qualitative fieldwork).

^{xv} This information is based on the DHS variable v746 : “respondent earns more than husband/partner”, with answer categories: more than him, less than him, about the same and husband/partner doesn't bring in money. The DHS also provides information on the woman’s labor participation, but at a 99.83% of participation, there is too little variation for this variable to be useful.