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Analyzing the Impact of Cigarette Pricing on Youth Smoking: A Comparative Study of Nigeria and Ghana

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ABSTRACT

Smoking remains a significant public health concern globally, with substantial economic and health ramifications. Particularly concerning is the rising prevalence of smoking in developing countries like Nigeria and Ghana, where limited resources and inadequate tobacco control policies pose significant challenges. This paper investigates the relationship between cigarette prices and youth smoking in Nigeria and Ghana, utilizing empirical literature and data analysis to understand the effectiveness of price-based interventions in curbing youth smoking rates. The study underscores the importance of targeted tobacco control policies, especially focusing on pricing mechanisms, to mitigate the looming tobacco epidemic in these regions.

Keywords: Cigarette prices, Youth smoking, Tobacco control policies, Nigeria, Ghana, Economic impact, Public health

INTRODUCTION

Smoking stands as the largest avoidable cause of death and major non-communicable disease globally [1]. It is linked with various market failures, notably negative externalities and imperfect information among market participants. The health ramifications of smoking translate into substantial healthcare expenses, partly subsidized by public funds. Moreover, the costs of medical treatment for smokers contribute to the inflation of health insurance premiums for all, irrespective of smoking involvement. Reduced labor market productivity is another consequence of tobacco consumption. These market failures serve as justifications for governmental interventions in the tobacco products market. Youth, in particular, garners attention from public policymakers and economists due to its effectiveness as a target group for smoking prevention programs [1], and the additional externalities associated with youth smoking. Nearly all initial cigarette use occurs during the high school years. At this age, consumers are either inadequately informed or fail to consciously process information regarding the health hazards of smoking. During this decision-making period, young individuals may not be fully cognizant of the health consequences of smoking. They typically underestimate the risk of cigarette addiction and mistakenly believe they can quit easily within a few years.

Traditionally, smoking has been more prevalent in economically developed countries and less so in the developing world. However, this trend is now

reversing, with smoking prevalence increasing in developing countries, especially among men [2]. As a result, it is estimated that approximately 70% of the 10 million deaths from tobacco-related causes expected by 2030 will occur in developing countries [2]. This rise in smoking prevalence in developing nations is anticipated to have significant public health repercussions throughout the 21st century, emphasizing the critical importance of prioritizing smoking surveillance and prevention efforts in these regions. Despite many countries committing to implement the World Health Organization Framework Convention on Tobacco Control (FCTC) [3], the resources allocated for tobacco control are often limited in developing countries. Additionally, there is a shortage of reliable data on smoking prevalence and its trends in these regions [4].

Country Prevalence

Ghana, a nation in sub-Saharan Africa boasting a population of approximately 30 million, has maintained a stable democracy since 1992 and experienced recent economic growth averaging around 6% per year [5]. British American Tobacco has established manufacturing operations in Ghana for the majority of the past 50 years [6], indicating that Ghana is at a relatively high risk of being involved in the tobacco epidemic. Nigeria follows a similar pattern, with relatively low current smoking prevalence rates of 7.0% for males and 0.2% for females in 2016 [7], but the number of smokers is

projected to more than double from 2010 to 2025 [8]. By 2025, it is estimated that there will be 1.7 million male smokers and 16.7 million female smokers in Nigeria. With a population exceeding 190 million, Nigeria currently ranks as the world's seventh most populous country but is expected to rise to the third most populous by 2050 [9]. Similarly, Ghana's population is projected to increase from 30 million to 52 million by 2050 [9]. Enhancing tobacco control policies in Ghana and Nigeria can help prevent the emergence of a large-scale tobacco epidemic. Recent surveys have revealed that smoking prevalence in both countries is higher among young adults (aged 25–29 years) than among older age groups (30–39 years). Given that an estimated 44% of Nigerians and 39% of Ghanaians were aged 14 or younger in 2017, it is evident that tobacco prevention strategies targeting youth will be particularly crucial.

Similar to much of Africa, Nigeria and Ghana have seen limited progress in implementing tobacco control policies [10]. Both countries have relatively low tobacco taxes compared to global standards. In 2016, Nigeria and Ghana were ranked in the bottom half of all African countries regarding overall cigarette taxes [10]. Prior to 2018, Nigeria had a tobacco excise tax rate of 20% ad valorem. In 2018, a new specific excise tax of $\text{€}1$ per stick ($\text{€}1 = \text{USD } 0.028$) was introduced, expected to increase to $\text{€}2.90$ by 2020. However, even with this increase, the excise tax burden on the retail price remained only at 17% [11], significantly below the WHO-recommended minimum excise tax burden of 70% and the current global average of 45%. Ghana also maintains low excise tax rates, with excise tax making up an estimated 13.0% of the retail price, and no recent efforts to increase the tax [10]. The relatively low cigarette prices in both countries suggest ample room for tax hikes, which could serve to mitigate the high probability of significant increases in tobacco use in both nations. Therefore, this paper aims to explore the impact of cigarette prices on youth cigarette consumption in Nigeria and Ghana.

Empirical Literature

One of the earliest micro-level studies on the economics of youth smoking emerged in the 1980s. [12], examined the smoking behavior of young respondents aged 12 to 17 years during the years 1966–1970. Their demand equation tested the impact of retail prices of cigarettes while controlling for various socioeconomic factors such as age, sex, race, family size, income, labor force status of the mother, and the influence of smuggling. Using a two-part model, they estimated an overall price elasticity of -1.44 , a figure higher than estimates from previous macro data studies. The authors hypothesized that young consumers might exhibit higher price

responsiveness than adults due to lower disposable income. They also observed that price had a greater effect on the decision to smoke than on the quantity of cigarettes smoked by a smoker. Anti-smoking advertising was found to have a negative effect on smoking initiation but did not alter the consumption behavior of existing smokers. In 1982, Lewit and Coate extended their research to include respondents aged 20 to 74 years old [9]. They concluded that smuggling could bias results and advocated for controlling for smuggling incentives. By dividing the sample into three age groups (20–25, 26–35, 36–74) and estimating separately, they confirmed the hypothesis regarding higher price elasticity among youth. This higher elasticity among youth could be attributed to factors such as shorter smoking history (preventing full development of nicotine addiction), higher discount rates for future consumption, and the stronger influence of peer pressure on young adults compared to older consumers. Similar to the 1981 study, they found that price had a larger impact on the decision to smoke than on the quantity of cigarettes consumed by smokers. [13] also conducted an analysis of respondents aged 20 to 74 years old.

Their demand equation controlled for state-level anti-smoking regulations and found insignificant effects of prices on the quantity of cigarettes smoked by young smokers. The authors attributed this finding to a positive correlation between cigarette prices and state smoking policies, arguing that previous studies may have overestimated price effects by ignoring this correlation (omitted variable bias). They also estimated price elasticities by year and found variations. For instance, the elasticities for 1970, 1974, and 1985 were 0.06, -0.017 , and -0.23 , respectively, leading them to hypothesize that elasticities were increasing over time, possibly due to growing awareness of the harms of smoking. However, the results of [13] were based on a relatively small sample of only 1,891 respondents. Chaloupka, in his publications from 1988, 1990, and 1991, delved into the addictive nature of smoking. Utilizing the rational addiction model, he analyzed longitudinal data from the Second National Health and Nutrition Examination Survey spanning 1976 to 1980. While controlling for various factors including age, race, gender, education, income, physical activity, and cigarette prices, he identified adjacent complementarities in cigarette consumption, providing support for the hypothesis of rational addiction. Chaloupka concurred with [13] regarding the price sensitivity of young adults, noting that they exhibited lower responsiveness compared to older age groups. This finding challenged the notion of higher price sensitivity among younger respondents, as it was corroborated by a significantly larger sample size. As a result of the

findings from [13] and [14], further investigation was undertaken to explore the issue of price responsiveness among young individuals. In 1994, [15] addressed the issue of smoking initiation, which is primarily associated with youth smoking participation.

They analyzed retrospective data from the 1978 and 1979 Smoking Supplements to the National Health Interview Survey using a hazard model called the split population duration model. Although they did not control for smuggling opportunities, which could bias the price effect towards zero, and did not include public policies in their models, the results of this analysis confirmed the influence of various socio-demographic variables on smoking initiation. However, they did not find prices to be a significant determinant of youth smoking. [16], utilized data from Monitoring the Future on 110,717 high school students from 1992 to 1994 to investigate price elasticities, the impact of smoking restrictions in public and private places, and the effects of rules limiting youth access to tobacco products. They employed two-part models with excise taxes as a price measure. The range of estimated cigarette price elasticities for various models (-0.846 to -1.450) supported the hypothesis of higher responsiveness of youth to cigarette price changes. In 1997, [17] estimated price and policy effects on the smoking behavior of 16,500 college students. The study confirmed the hypothesis that young adults exhibit relatively high price sensitivity to cigarette prices, with overall price elasticity ranging from -0.906 to -1.309. Only relatively stringent limits on smoking in public places had negative and significant effects on smoking participation, and some restrictions could reduce the quantity of cigarettes smoked by smokers. [18] estimated overall price elasticities for two different age groups (18-24 and 25-39) and found the younger group to

be more responsive to changes in cigarette prices, with price elasticities of -0.63 and -0.42, respectively. Having information on cigarette brand choices in their dataset, they explored whether a tax change could alter smokers' brand preferences. They discovered that a tax increase might prompt compensating behavior, such as a shift towards longer cigarettes or those with higher nicotine and tar content. The younger age group (18-24) exhibited particularly strong substitution reactions, potentially leading to higher tar/nicotine intake for those smokers who continued despite the tax increase. [18] investigated the effects of limits on youth access to tobacco on smoking rates among respondents from the 8th, 10th, and 12th grades in 1994 from the Monitoring the Future Project. Recognizing that previous mixed results on tobacco control policies were due to lack of enforcement, they supplemented the data with variables concerning state monitoring activities, enforcement of regulations limiting youth access to tobacco, and compliance with them. After controlling for smuggling, the authors estimated the total price elasticity of cigarette demand at -1.141, with the price elasticity of participation at -0.618 and the conditional price elasticity at -0.523. Most state and local non-tax tobacco control policies did not significantly affect youth smoking, except for relatively strong restrictions. However, when the policy variables were jointly tested for significance, their combined impact on smoking participation was significant. The most consistent conclusion from the economic literature on cigarette demand is that consumers respond to price changes in line with general economic principles—an increase in price leads to a decrease in consumption. Prices not only regulate the quantity of cigarettes consumed but also influence smoking prevalence among the young population.

CONCLUSION

This comparative study of Nigeria and Ghana explores the impact of cigarette pricing on youth smoking behavior, shedding light on the effectiveness of tobacco taxation as a public health intervention. Drawing from empirical literature and data analysis, several key conclusions emerge. Firstly, it is evident that higher cigarette prices are associated with reductions in smoking prevalence and intensity among youth in Sub-Saharan Africa, as observed in multiple countries including South Africa, Tanzania, Uganda, and Zambia. International studies support the notion that young people are particularly sensitive to price changes, emphasizing the effectiveness of tobacco taxation in curbing youth smoking, especially in regions with high population growth rates. Secondly, the findings underscore the urgent need for enhanced tobacco control policies in Nigeria and Ghana, where

smoking prevalence among young adults is higher compared to older age groups. Despite limited progress in implementing tobacco control measures, both countries have relatively low tobacco taxes, presenting an opportunity for tax hikes to mitigate the growing tobacco epidemic. Thirdly, previous research has demonstrated the responsiveness of youth to cigarette price changes, with higher price elasticities observed among younger age groups. This sensitivity to pricing suggests that increasing cigarette prices through taxation can not only deter youth smoking initiation but also generate higher government revenue that can be reinvested in education and healthcare sectors, thereby promoting public health and socioeconomic development. Overall, the study underscores the critical role of cigarette pricing in shaping youth smoking behavior and highlights the potential of tobacco taxation as

an effective strategy for tobacco control in Nigeria, Ghana, and other similar contexts. By implementing evidence-based policies and interventions, policymakers can address the public health

challenges associated with smoking and contribute to the well-being of young people and the broader population.

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