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Zakat Collectible in OIC Countries for Poverty Alleviation: A Primer on Empirical Estimation

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ABSTRACT

This study estimates potential Zakat collectible in 17 member countries of the Organization of Islamic Cooperation (OIC). In our estimation, we found that the zakat to GDP ratio exceeds the poverty gap index to GDP (PGI-GDP) ratio in all but 3 countries, with poverty line defined at $1.25 a day. We also found that the zakat to GDP ratio exceeds the PGI-GDP ratio, except in 4 countries with poverty line defined at $2.00 a day. We also compared zakat to GDP ratio against poverty headcount ratio. According to our estimates, the Zakat to GDP ratio exceeds the poverty head count ratio to GDP (PHCR-GDP), except in 5 countries with poverty line defined at $1.25 a day. We also found that zakat to GDP ratio exceeds PHCR-GDP ratio except in 7 countries, with poverty line defined at $2.00 a day. Thus, the institution of Zakat has ample potential to contribute towards the alleviation of poverty. Lastly, we show that the aggregate resources pooled together from the potential Zakat collection in 17 OIC countries will be enough to fund resources for poverty alleviation in all 17 OIC countries combined.

Keywords: Zakat, Fiscal Policy, Poverty, Redistribution

INTRODUCTION

More than a billion people live in poverty even in the twenty first century. On the other hand, there has been an unprecedented change in income disparity between the poor and the rich people during the last half century. According to Oxfam, the 62 richest billionaires own as much wealth as the poorer half of the world's population. In contrast, one in every four people in Africa goes to bed hungry every night, according to the Food and Agriculture Organization. Do we really have such a scarcity of resources that we cannot end poverty, hunger, and famine? Nobel Laureate Sen (1983) did research on famine in Bengal and argued that the famine was not caused from the lack of resources. It is also striking to note that the world agriculture produces 17 percent more calories per person today than it did 30 years ago, despite a 70 percent increase in the population (Pingali, 2002).

These considerations imply that the world has sufficient resources to feed everyone, but these resources are not equally distributed. Inequality in wealth distribution is often the result of income differences arising due to differences in risk tolerance, work effort, productivity, and human capital, to name a few factors. However, the level of inequality increased dramatically in the post-World War II period, as documented by Piketty (2014), even as some of the developed economies actually faced slowdown of productivity growth since the 1980s.

While both the developed and developing worlds need to find answers for the egalitarian distribution of income, the developing world also has to achieve a decline in poverty. Most of the countries in the Organization of Islamic Cooperation (OIC) are generally poorer than other countries. Most of the population in poverty resides in Africa and Asia, and the bulk of the OIC countries are located in these continents. Half of the global poverty is from the Muslim world, while the Muslim population comprises only 24 percent of the total global population. In a recent study conducted in Pakistan by Naveed and Ali (2012), as many as 58.7 million people in Pakistan are living in multidimensional poverty, with 46 percent of the rural population and 18 percent of the urban households falling below the poverty line. Other OIC countries such as Bangladesh and Nigeria also have a high poverty headcount ratio of 43 percent and 62 percent respectively. Due to the widespread poverty and weak governments, most of the OIC countries rank lower than other countries in spending on schooling and health services. Hence, the level of human capital, productivity, and national income in these countries remain at low levels.

Under these circumstances, we sought to empirically analyze the potential of zakat as an institution of wealth redistribution to help in addressing the poverty in the OIC countries. The paper is organized as follows. Section 2 provides a review of literature on the socio-economic effects of zakat and its administration in the contemporary economies. Section 3 gives details on the research methodology, including sampling methodology and the methods we used to estimate potential zakat collectible. Finally, section 4 presents the results of our analysis. We estimate and compare the potential zakat collectible against the funding gap for alleviating poverty in each of the 17 OIC countries.

LITERATURE REVIEW

Wahid (1986) explains that zakat is a compulsory payment on the part of Muslims as a share to the poor. Although it is a religious obligation, zakat also has a variety of economic and social ramifications. In early empirical literature on the welfare potential of Infaq (charity) to alleviate poverty in Pakistan, Malik et al. (1994) use micro-data to establish that *Infaq* (charity) does have a significant impact on reducing the poverty gap. In a recent empirical study on OIC countries, Shirazi and Amin (2009) estimate the resources required for poverty elimination under $1.25 a day and $2.0 a day. Their estimates for Pakistan suggest that the country needs 1 percent of gross domestic product (GDP) for elimination of poverty defined by earnings less than under $1.25 a day and 6.77 percent of GDP for elimination of poverty defined by earnings under $2 a day. In another study from Pakistan, Kahf (1989) uses different zakat categories, and according to his estimate, zakat collection can be between 1.6 percent of GDP to 4.4 percent of GDP.

In a more recent study, Azam et al. (2014) in an empirical study in Pakistan established that zakat significantly enhances the welfare of the households. Akram and Afzal (2014), in an empirical study from Pakistan, report that zakat disbursement among the poor, needy, destitute, orphans, and widows has played a significant role in poverty alleviation. Their results show that there is an inverse relationship between poverty and zakat disbursement, both in the short and long run.

Using aggregate data for Malaysia, Suprayitno et al. (2013) find that zakat distribution has a positive, but small impact on aggregate consumption. Hence, zakat

distribution should not be limited to the consumption needs, but should also cover other forms of monetary aid that can generate a continuous flow of income for zakat recipients. In another recent study, Abdelmawla (2014) argued, based on empirical evidence using aggregated data for Sudan, that zakat along with educational attainment significantly reduced poverty in Sudan. However, we note here that using aggregated data for most OIC countries where official zakat collection is very low does not make a convincing case for poverty alleviation.

In another empirical study from Bangladesh, Hassan and Jauanyed (2007) estimated that zakat funds can replace the government budgetary expenditures ranging from 21 percent of Annual Development Plan (ADP) in 1983-84 to 43 percent of ADP in 2004-2005. In a study from Malaysia, Sadeq (1996) reports that about 73 percent of the estimated potential zakat collection will be needed annually to change the status of hard-core households to the status of non-poor households in Malaysia. Ibrahim (2006) contends in an empirical study from Malaysia that zakat distribution reduces income inequality. His analysis reveals that zakat distribution reduces poverty incidence and lessens the severity of poverty. Firdaus et al. (2012) estimate the potential of zakat institution in Indonesia by surveying 345 households. Their results show that Zakat collection could reach 3.4 percent of Indonesia's GDP.

Some studies have also shown the comparative potential of zakat as a superior tool for poverty alleviation. Debnath et al. (2013) assessed the effectiveness of Zakat as an alternative to microcredit in alleviating poverty in Bangladesh. Through the Propensity Score Matching (PSM) techniques, the study indicates that the impact of the zakat scheme was greater than that of the microcredit programs. Furthermore, the study also highlights that the zakat scheme significantly, with increases in both income and expenditure of the recipients in comparison to the microcredit programs.

Other researchers such as Nadzri et al. (2012) recommend integrating the various poverty alleviation and redistribution tools for creating synergies. The effectiveness of zakat institutions may improve by collaborating with other institutions such as microfinance institutions. Shirazi (2014) suggests that the institutions of zakat and waqf (charitable trust) need to be integrated into the poverty-reduction strategy of the Islamic Development Bank (IDB) member countries. The proceeds of these institutions should be made part of their pro-poor budgetary expenditures. Hassan (2010) suggests a model that combines Islamic microfinance with two traditional Islamic tools of poverty alleviation such as zakat and waqf in an institutional setup. Hassan (2010) argues that the poor borrowers will have less debt burden because their capital investments will be partly met by funds from zakat, which would not require any repayment.

Norazlina and Rahim (2011) identify that there are many types of programs that could be funded by zakat such as providing schooling, vocational training, and business support by establishing cottage industries and providing fixed assets and equipment to small businesses. In addition, zakat could also be used to provide low-cost housing and health care. Abdullah and Suhaib (2011) argue that if zakat is established as an institution, it will create a collective social security scheme for mutual help and the generated resources can be further utilized for social development.

To achieve such diverse contemporary needs, the institution of zakat is dynamic and flexible. In the Umer (rta) and Abu Bakar (rta) period of government,

zakat was collected by the government. However, in the Usman (rta) period, people were allowed to pay zakat privately (Kuran, 2003). Horses were exempted from zakat in the Prophet's time, but Umer (rta) brought them in the zakat net in his period. Similarly, Mahmud (2001) informs that Umer (rta) levied zakat on horses and skins, and at the time when the Arab region was hit by drought and famine, he exempted the poor from zakat and suspended zakat from the rich. Usman (rta) also levied Zakat on the production in forests, which was not the case in the earlier period (Nadvi, 1996). Hence, a policy maker in a modern economy can use the flexibly of this institution to maximize the welfare benefits of the zakat system.

Nevertheless, at present, zakat is not collected by the government in most countries and is not considered a compulsory payment to the government (Powell, 2009). Ahmad et al. (2006) examines factors contributing to the dissatisfaction towards formal zakat institutions based on a sample of 753 respondents who paid zakat to six privatized institutions. They used logistic regression to analyse the probability of paying to such zakat institutions. Their results indicate that the satisfaction on the distribution and efficient management of zakat are the main factors influencing zakat payment. About 57 percent of the respondents were dissatisfied with the distribution of zakat funds, which significantly affects payments to the zakat institutions. Wahid et al. (2008) reveals two main factors contributing to dissatisfaction, namely, the ineffectiveness of zakat distribution and the lack of transparency on information about the distribution of zakat. The lack of confidence regarding the governance of zakat institutions due to the perceived lack of efficiency and effectiveness may directly undermine the collection of potential zakat and the realization of the desired socio-economic objectives. Abu Bakar et al. (2007) argue that the lack of proper implementation of zakat in OIC countries limits the success of the noble aims of the zakat institution.

To help change this state of affairs, Yusoff (2011) urges that every Muslim country must organize zakat collection and zakat spending in the most effective and efficient manner. Azam et al. (2014) also suggest that there is a need to institutionalize the Zakat collection system in order to increase the overall zakat collection. In another study, Rahman (2003) proposes the introduction of two zakat governance measures: the promulgation of Islamic accounting standard and structural and policy reform towards more effective zakat distribution.

One of the other potential reasons for the insignificant size of central zakat collection and ineffective disbursement is that the mainstream Islamic scholarship allows taxes to be levied other than zakat for mobilizing public finance. Maududi (1970) argues that zakat is a religious obligation and is not a substitute of tax. The same opinion is held by Siddiqui (1978) and Shaik (1979). Siddiqui (1978) cites the opinion of prominent Islamic jurists such as Ibn-e-Hazm and Imam Shatibi in support of this view. These scholars hold that taxes other than zakat can be imposed in an Islamic economy if these taxes are levied by the legislative council and used for public welfare. He contends that the taxes discouraged in Ahadith are those imposed by the autocratic kings for their own lavish consumption, and this kind of usurpation of public property was discouraged in Islam.

Besides governance, there is a dire need for a standardized approach on determination of the zakat base. Shirazi & Amin (2009) argue that since there is no agreement among the scholars on the new wealth that may be covered by zakat, there is an urgent need for general consensus on

the definition of the items to be considered as zakatable items. This requires Ijma (consensus) of the Ulama (Islamic scholars) and other contemporary scholars on the issue.

On the need for extending the coverage of zakat by including all forms of wealth and produce, Qardawi (1999, p. 333) applies the methodology of Qiyas (analogical reasoning) and reasons that the emerging and increasing types of wealth in the modern times such as bank deposits and financial securities such as shares and bonds may also be covered under zakat (Qaradawi, 1999). Abu Bakar et al. (2007) also suggest that the Illah (basis or reasoning) for zakatability should no longer be productive property, but any property which is in excess of one's personal use. Haneef and Mahmud (2011) also argue that the general directives of the Quran do not restrict the application of zakat to certain types of wealth to the exclusion of others.

That is why wealth or assets subject to zakat should include cash in hand or at bank; gold; and silver; held-for-trade inventory; real estate purchased for the purpose of resale; and all kinds of financial investments in stocks, bonds, debentures, national saving schemes, and mutual funds. Likewise, production is not limited to agriculture nowadays. The major part of production comes from industries as well as services sector. Therefore, income from the industrial production and from the services sector could also be taxed similar to agricultural yield.

Lastly, we discuss another important question regarding whether the investment in financial instruments should be subject to wealth zakat with total investment value or should only the income from such financial investments be subject to income zakat. Khan (2005) contends that investment in stocks should be interpreted as any other investment with some means of earning income. Investment in a stock is a means of earning dividend income or capital gains. Like means of production/income are exempted from zakat, investment in stocks should be exempted from wealth zakat. Therefore, any income arising from the investment in stocks must be subject to income zakat. Similarly, this argument could be extended to introduce income zakat on mutual funds, investment in National Savings Schemes (NSS), debentures, and bonds. Furthermore, if a real estate is leased, the real estate becomes the means of earning rent for the owner. Hence, income zakat could also be introduced on rental income.

To summarize, we see that on theoretical grounds, zakat is an important redistributive institution. If the governments improve the governance, administration, and effective and transparent distribution of zakat funds, then tremendous gains can be achieved in improving public welfare.

RESEARCH METHODOLOGY

Sample

For the estimation of potential zakat collectible at the aggregate level, we selected 17 members of OIC. The selection is based on the availability of complete data. Due to non-availability of data for some variables, we had to drop a few OIC countries from the sample. Since the variables are needed to form an aggregate series, any missing value would have been detrimental in this estimation exercise. This is different from the case of missing observations or variables in a regression analysis where the variables are used to explain changes in a dependent variable rather than form an aggregate series.

Data

The data are obtained from World Bank's World Development Indicators (WDI) for the period 2008-2013. For official gold holdings in each country, we used the data provided by the World Gold Council. For measuring poverty, we use following variables:

Table 1. List of Variables Used for Poverty Measurement

Variable	Description
Poverty gap at $1.25 a day (PPP)	Mean shortfall from the poverty line ($1.25 a day), as a percentage of the poverty line.
Poverty headcount ratio at $1.25 a day (PPP)	Percent of total population with income below $1.25 day.
Poverty gap at $2 a day (PPP)	Mean shortfall from the poverty line ($2.0 a day), as a percentage of the poverty line.
Poverty headcount ratio at $2.00 a day (PPP)	Percent of total population with income below $2.0 day.

Source: Author (2016)

In this estimation exercise, we selected following variables:

Table 2. List of Variables Used in Zakat Estimation

Variable Name	Unit of Measurement
Total reserves (includes gold)	Current US$.
Total reserves minus gold	Current US$.
Official gold reserves	Current US$.
Broad money	Current US$.
Broad money to GDP	Ratio
Market capitalization	Current US$.
GDP	Current US$.
Changes in inventories	Current US$.
Agriculture, value added	Current US$.
Industry, value added	Current US$.
Services, value added	Current US$.
Agricultural irrigated land	Percent of total agricultural land.
Total natural resources rents to GDP	Ratio
Total natural resources rents	Current US$.
Population	Total number of people alive in the country.
Proportion of Muslim population	Percent of Muslims in total population.
Percent income held by top 20 percent	Percent of total personal income.

Source: Author (2016)

Method for Computing Aggregate Zakat

For estimating zakat on wealth, we used the following heads:

- Estimated private gold holdings
- Broad money
- Market capitalization of stock
- Inventory investment (as proxy for unsold inventory).

To estimate private gold holdings, we use the following formula:

$$\text{Private Gold Holdings} = \frac{\text{Official Gold Reserves}}{\text{Total Reserves}/\text{Broad Money}} \quad \text{--- (i)}$$

The proxy uses an assumption that government holds as much official gold reserves as the ratio of private gold holdings as it holds total reserves as the ratio of broad money. For instance, if the ratio of total reserves to broad money is 20 percent, then we assume that the government's official gold holdings as a ratio of total private gold holdings will also be 20 percent. Since we know the official reported gold holdings of governments, we can estimate the private gold holdings using the above formula. Here, we assume that the government's choice of keeping monetary and gold reserves as a proportion of broad money and total private holdings, respectively, is the same in the long run.

Since zakat is levied on currency in ownership as well as on money deposited in bank accounts, we use broad money as a proxy for the wealth held as currency and in bank accounts. For zakat on market value of stocks, we use market capitalization. It is calculated as follows:

$$\text{Market Capitalization} = \sum_{i=1}^{n} N_i P_i \quad \text{--- (ii)}$$

Where N_i is the number of shares outstanding for company "i", and P_i is the current market price of the stock of company "i".

Lastly, to estimate the unsold tradable inventory, we use the figure for "inventory investment", as reported in the national income accounts. In national income accounting, "inventory investment" represents the value of production in a particular year that remains unsold during that year. It is assumed that the firm has purchased unsold inventory from itself. However, the "inventory investment" figure reported in national income accounts gives an estimate of the tradable inventory for production that took place only in that year. The actual tradable inventory could be much more than the reported figure. We sought to estimate the value of this wealth zakat function:

$$WZ = \sum_{x=1}^{n} 0.025(W_x - MNA) \quad \text{--- (iii)}$$

Here,
"WZ" refers to total wealth zakat.
"W_x" refers to wealth in ownership of individual x.
"MNA" refers to minimum *nisaab* amount. It is computed as the market value of 612 grams of silver.

To deduct the *nisaab* amount at the aggregate level, we have to estimate the number of people whose wealth in ownership exceeds the *nisaab* amount. We take a conservative route to assume that the people in the top income quintile of the population will have wealth exceeding the *nisaab* amount.

We define "P_{MNA}" as a set of all people belonging to the top income quintile and have wealth exceeding the *nisaab* amount. Mathematically it is expressed as follows:

$$P_{MNA} = \{x \in P_{top\ 20\%} | W_x > MNA\} \quad \text{--- (iv)}$$

If an individual "x" belongs to the top income quintile, he is assumed to have wealth exceeding *nisaab* amount. From the aggregate value of assets that are subject to wealth zakat, we have to deduct the product: $\{P_{MNA}\ x\ MNA\}$

In the second part of the estimation, we attempted to estimate the total production value tax that can be collected in individual economies in our sample. The rate of production value tax can be 5 percent, 10 percent, or 20 percent. Production processes that mix both labor- and capital-intensive inputs are subject to 5 percent production value tax. Production processes that majorly use either labor- or capital-intensive inputs are subject to 10 percent production value tax. Incomes from sources that neither use labor- nor capital-intensive inputs are subject to 20 percent production value tax.

Mathematically, we can represent this principle of levy as in equation (v). Here, $\bar{L}$ and $\bar{K}$ represent very minimal use of the inputs in fixed amount. "PVT" refers to the production value tax.

$$PVT = \begin{cases} 10\% & y = f(L, \bar{K}) \\ 10\% & y = f(\bar{L}, K) \\ 5\% & y = f(L, K) \\ 20\% & y = f(\bar{L}, \bar{K}) \end{cases} \quad \text{--- (v)}$$

Hence, we apply a 5 percent production value tax on production arising from irrigated land and production value of output produced in industry and services sector. We apply 10 percent production value tax on production arising from rain-fed lands. Finally, we apply 20 percent production value tax on production arising from rents on natural resources.

Since zakat is only levied on Muslims, we make the adjustment in all variables to account for that. We assume that in the long run, the proportion of Muslims and non-Muslims in the top income quintile will be the same as their proportionate distribution in total population.

For measuring poverty, we use two measures, namely, poverty headcount ratio and poverty gap. Poverty headcount ratio is computed as a ratio of the number of people in poverty divided by the total population. The poverty gap index is computed as follows:

$$PGI = \frac{1}{N}\sum_{j=1}^{q}\left(\frac{z-y_j}{z}\right) \quad \text{--- (vi)}$$

$$PGI = \frac{1}{N}\sum_{j=1}^{N}\left(\frac{(z-y_j).1(y_j<z)}{z}\right) \quad \text{--- (vii)}$$

Here, "N" is the total population of a country, "q" is the total number of poor people in the population with income below the poverty line, "z" is the poverty line defined by a particular threshold of income like $1.25 or $2 a day and "$y_j$" is the income of the poor individual "j". In this index, the poverty gap for individuals whose income is above the poverty line is zero.

Ahmed (2004) uses a conservative crude measure of poverty gap by multiplying the number of poor people with the average minimum annual income of $365 or dollar a day, per non-poor person. This is a conservative measure since it assumes that poor people have zero annual income (Shirazi & Amin, 2009). Hence, we use both measures for comparative analysis.

RESULTS & DISCUSSIONS

In this section, we present the results of our estimation. We have presented the results in Table 3. In Table 3, "ZGDP" refers to zakat to GDP ratio. "PGI-GDP" refers to the Poverty Gap Index to GDP ratio. It is computed as follows:

$$PGI\ to\ GDP = \frac{PGI * y_p * N}{GDP} \quad \text{--- (viii)}$$

Here,
"PGI" refers to Poverty Gap Index value.
"y_p" refers to income at poverty line in current $.
"N" refers to the total number of people in the country.
"GDP" refers to the value of Gross Domestic Product.

In Table 3, "PHCR-GDP" refers to Poverty Head Count Ratio to GDP. It is computed as follows:

$$\text{PHCR to GDP} = \frac{\text{PHCR} * y_p * N}{\text{GDP}} \quad \text{--- (ix)}$$

Here,
"PHCR" refers to Poverty Head Count Ratio.
"y_p", "N"and "GDP" have the same meaning as defined above.

We can see that zakat to GDP ratio exceeds the PGI-GDP ratio, except in 3 countries with poverty line defined at $1.25 a day. Only in Bangladesh, Mozambique and Nigeria, the zakat to GDP ratio is less than PGI-GDP ratio with poverty line defined at $1.25 a day. Mozambique is one of the members of OIC, with a very small proportion of Muslim population. Additionally, zakat to GDP ratio exceeds PGI-GDP ratio in all but 4 countries, with poverty line defined at $2.00 a day. Only in Bangladesh, Mozambique, Nigeria, and Pakistan, the zakat to GDP ratio is less than the PGI-GDP ratio, with poverty line defined at $2.00 a day.

We also compared the zakat to GDP ratio against the poverty headcount ratio. However, one must note that the estimate of funding gap from poverty headcount ratio assumes that poor people have zero income. Hence, it exaggerates the true funding needed to alleviate poverty. We can see that the zakat to GDP ratio exceeds PHCR-GDP ratio in all but 5 countries, with poverty line defined at $1.25 a day. The countries in which zakat to GDP ratio is less than PHCR-GDP ratio when the poverty line defined at $2.00 a day include Bangladesh, Mozambique, Nigeria, Pakistan, and Tajikistan. Further, the zakat to GDP ratio exceeds the PHCR-GDP ratio in all but 7 countries with poverty line defined at $2.00 a day. Countries in which zakat to GDP ratio is less than PHCR-GDP ratio with poverty line defined at $2.00 a day include Bangladesh, Indonesia, Kyrgyz Republic, Mozambique, Nigeria, Pakistan, and Tajikistan.

Therefore, we can see that in most countries, if the potential zakat collection is made and disbursed effectively, the poverty gap can be funded even in the first round. Since zakat is a combination of net worth and production value tax, it works effectively, irrespective of the phase of the business cycle. Furthermore, it targets the poor and ultra-poor specifically and achieves direct redistribution.

Table 3. Zakat to GDP, Poverty Gap to GDP and Poverty Rate to GDP Ratio

Country	ZGDP	PGI-GDP ($1.25)	PGI-GDP ($2.00)	PHCR-GDP ($1.25)	PHCR-GDP ($2.00)
Albania	2.60%	0.01%	0.09 %	0.05%	0.47%
Azerbaijan	5.83%	0.01%	0.05%	0.02%	0.14%
Bangladesh	2.76%	5.32%	23.13%	20.63%	58.30%
Egypt	3.69%	0.05%	0.62%	0.23%	3.39%
Indonesia	3.53%	0.35%	2.74%	2.13%	9.10%
Jordon	4.30%	0.00%	0.02%	0.01%	0.17%
Kazakhstan	2.69%	0.00%	0.01%	0.00%	0.03%
Kyrgyz Republic	3.13%	0.43%	3.07%	1.84%	12.19%
Malaysia	4.59%	0.02%	0.16%	-	-
Morocco	5.01%	0.08%	0.74%	0.38%	3.30%
Mozambique	0.97%	19.49%	52.67%	45.77%	99.54%
Nigeria	2.20%	4.17%	10.88%	9.41%	19.97%
Pakistan	2.54%	0.69%	7.58%	4.54%	29.02%
Saudi Arabia	8.45%	-	-	0.35%	0.70%
Tajikistan	2.36%	0.56%	4.71%	9.11%	19.30%
Tunisia	3.73%	0.02%	0.16%	0.27%	0.76%
Turkey	3.42%	0.00%	0.03%	0.06%	0.17%

Source: Author's Computations (2016)

In Table 4, we show the zakat estimation for the individual years during the period between 2008 and 13. It can be seen that the estimates have little variance over the years. Hence, the institution of zakat can provide a stable source of public revenue that can be spent on public welfare directly by transfer of monetary and non-monetary assets along with the provision of health and educational services mediated by welfare institutions from the zakat fund. Since the institution of zakat only collects zakat from the people who hold at least a prescribed amount of wealth, it ensures that the zakat payers are richer than the Zakat recipients. This ensures socio-economic mobility and contributes towards egalitarian income distribution.

In our estimation, we assumed that only people in the top income quintile are asked to pay zakat. The actual number of people eligible for zakat payment may be even more, particularly in the middle-income countries and emerging economies of South Asia. Since the *nisaab* value is equivalent to the value of 612 grams of silver, the people who come out of poverty can eventually become zakat payers after having been zakat recipients.

Table 4. Zakat to GDP Ratio during 2008-2013

Country	2008	2009	2010	2011	2012	2013
Albania	2.51%	2.46%	2.58%	2.57%	2.62%	2.60%
Azerbaijan	7.57%	5.92%	6.13%	5.86%	5.41%	5.83%
Bangladesh	3.48%	3.06%	3.01%	2.91%	2.83%	2.76%
Egypt	5.34%	4.02%	3.85%	3.99%	3.72%	3.69%
Indonesia	4.66%	4.03%	3.82%	3.69%	3.52%	3.53%
Jordon	5.84%	5.01%	4.79%	4.67%	4.50%	4.30%
Kazakhstan	3.62%	3.05%	2.97%	2.95%	2.72%	2.69%
Kyrgyz Republic	2.98%	3.02%	3.28%	3.12%	3.20%	3.13%
Malaysia	6.05%	5.99%	5.28%	4.85%	4.65%	4.59%
Morocco	5.61%	4.92%	5.02%	5.10%	5.16%	5.01%
Mozambique	1.21%	1.07%	1.12%	1.03%	0.98%	0.97%
Nigeria	1.80%	3.01%	2.30%	2.39%	2.22%	2.20%
Pakistan	3.06%	2.68%	2.68%	2.64%	2.59%	2.54%
Saudi Arabia	10.58%	8.81%	8.53%	8.85%	8.48%	8.45%
Tajikistan	2.39%	2.37%	2.44%	2.37%	2.36%	2.36%
Tunisia	4.20%	3.59%	3.66%	3.77%	3.77%	3.73%
Turkey	3.48%	3.80%	3.53%	3.55%	3.49%	3.42%

Source: Author's Computations (2016)

In Table 5, we present the correlation between zakat to GDP ratio and GDP growth rate for the 6 year period between 2008 and 13. It can be seen that the absolute value of the correlation coefficient is more than 0.7 in only 3 of 17 countries. It is more than 0.8 in only 2 out of 17 countries. In 10 out of the 17 countries, the correlation is negative, which indicates the countercyclical stabilization potential of the institution of zakat.

Table 5. Correlation between ZGDP & GDP Growth during 2008-13

Country	Correlation Between GDP Growth & ZGDP
Albania	-0.58093
Azerbaijan	0.686503
Bangladesh	-0.25932
Egypt	0.785502
Indonesia	-0.22489
Jordon	0.895576
Kazakhstan	-0.42568

Kyrgyz Republic	-0.59264
Malaysia	-0.52276
Morocco	0.40042
Mozambique	-0.80824
Nigeria	0.241723
Pakistan	-0.71059
Saudi Arabia	0.436444
Tajikistan	-0.03663
Tunisia	0.301337
Turkey	-0.57057

Source: Author's Computations (2016)

Next, we examine how long it will take to fund the poverty gap through the institution of zakat. The time is represented as the number of years for each of the four poverty measures that we have used in the study. We have assumed that the zakat recipients do not become zakat payers immediately; otherwise, the speed of reaching the target will increase as social mobility sets in. Table 6 presents the results of this analysis.

Table 6. Years Required to Fund Poverty with Potential Zakat Collection for 2013

Country	ZGDP	PGI-GDP ($1.25)	PGI-GDP ($2.00)	PHCR-GDP ($1.25)	PHCR-GDP ($2.00)
Albania	2.60%	0.00	0.04	0.02	0.18
Azerbaijan	5.83%	0.00	0.01	0.00	0.02
Bangladesh	2.76%	1.93	8.38	7.47	21.12
Egypt	3.69%	0.01	0.17	0.06	0.92
Indonesia	3.53%	0.10	0.78	0.60	2.58
Jordon	4.30%	0.00	0.01	0.00	0.04
Kazakhstan	2.69%	0.00	0.00	0.00	0.01
Kyrgyz Republic	3.13%	0.14	0.98	0.59	3.89
Malaysia	4.59%	0.00	0.03	0.00	0.00
Morocco	5.01%	0.02	0.15	0.08	0.66
Mozambique	0.97%	20.09	54.29	47.19	102.62
Nigeria	2.20%	1.89	4.94	4.28	9.08
Pakistan	2.54%	0.27	2.99	1.79	11.43
Saudi Arabia	8.45%	0.00	0.00	0.04	0.08
Tajikistan	2.36%	0.24	2.00	3.86	8.18
Tunisia	3.73%	0.01	0.04	0.07	0.20
Turkey	3.42%	0.00	0.01	0.02	0.05

Source: Author's Computations (2016)

In Table 7, we present the number of people that can be lifted out of poverty with the realization of potential collectible zakat. The second and third columns show how much poor people can be lifted out of poverty in terms of the multiple or fraction of the total poor people with poverty line defined at $1.25 and $2.00 a day. It can be seen that in most countries, the value is greater than 1, which suggests that if the potential zakat collectible is indeed collected by the government and disbursed through direct transfers, these poor people can be helped adequately. However, it is necessary that poor people are provided with this transfer payment for the necessary duration so that they can survive as well as permanently move on to the status of non-poor. In this regard, the educational and health institutions of the public sector need to provide effective and affordable services with state of the art quality so that the income earning capacity of these poor people can be enhanced, along with ensuring their survival and meeting the basic physiological needs of life.

Table 7. People Lifted Out of Poverty from Potential Zakat Collection for 2013

Country	People Lifted Out of Poverty (No.)	Multiple of Total Poor ($1.25/Day)	Multiple of Total Poor ($2.00/Day)
Albania	735,046	53.00	21.52
Azerbaijan	8,669,335	306.88	129.95
Bangladesh	9,082,150	0.13	0.00
Egypt	22,000,113	15.77	1.08
Indonesia	67,120,324	1.66	0.04
Jordon	3,171,523	491.02	414.16
Kazakhstan	13,658,865	801.69	1,776.80
Kyrgyz Republic	495,829	1.70	0.09
Malaysia	31,492,916	211.95	150.09
Morocco	11,401,599	13.29	0.94
Mozambique	333,727	0.02	0.00
Nigeria	25,118,087	0.23	0.01
Pakistan	12,921,233	0.56	0.01
Saudi Arabia	138,644,438	24.05	19.24
Tajikistan	440,016	0.26	0.01
Tunisia	3,844,006	88,981,612.33	314.37
Turkey	61,680,905	58.80	22.94

Source: Author's Computations (2016)

Lastly, we show whether the OIC countries we had selected in our sample collectively have enough resources to overcome poverty from the realization of potential zakat collectible. It can be seen from the table that on most counts of poverty, the aggregate resources pooled together from the potential zakat collection

will be sufficient to fund resources for poverty alleviation. Hence, it is important that OIC to collaborate with member countries and transfer necessary resources from the zakat surplus regions to the zakat deficit regions.

Table 8. People Lifted Out of Poverty from Potential Zakat Collection for 2013

Country	Potential Zakat Collectible (mln $)	PGI ($1.25 Per Day)	PGI ($2 Per Day)	PHCR ($1.25 Per Day)	PHCR ($2 Per Day)
Albania	335	1	12	6	61
Azerbaijan	3,955	5	37	13	103
Bangladesh	4,144	7,981	34,694	30,936	87,450
Egypt	10,038	139	1,695	636	9,225
Indonesia	30,624	3,055	23,785	18,468	78,980
Jordon	1,447	1	8	3	57
Kazakhstan	6,232	1	15	8	62
Kyrgyz Republic	226	31	222	133	881
Malaysia	14,369	68	499	68	499
Morocco	5,202	83	773	392	3,422
Mozambique	152	3,046	8,232	7,154	15,558
Nigeria	11,460	21,752	56,766	49,111	104,180
Pakistan	5,895	1,612	17,618	10,554	67,413
Saudi Arabia	63,257	2,631	5,261	2,631	5,261
Tajikistan	201	48	401	775	1,642
Tunisia	1,754	10	76	129	358
Turkey	28,142	17	241	479	1,422
Total	187,432	40,478	150,336	121,497	376,573
Surplus/Shortfall		146,954	37,096	65,935	-

Source: Author's Computations (2016)

In Table 9, we provide a numerical example of wealth redistribution under the zakat system. Suppose, we have an interest-free economy that comprises 10 rich people, each having wealth of $1,010. We also assume that there are 50 poor people, each having wealth of $2. Let us suppose that the *nisaab* amount in this interest-free economy is $10. Column 2 shows the aggregate wealth of the rich people. Column 3 shows the wealth transferred from the rich to the poor during each year. Column 4 shows the aggregate wealth of poor people after wealth transfer. For simplicity, we suppose perfect wealth equality between the people in each group. For the sake of highlighting the effect of wealth redistribution of wealth transfers, we assume that income is generated randomly in this interest-free economy, with no interest-based lending allowed. Furthermore, we assume that income earned is consumed in that period to enable us to focus our attention on the wealth redistribution effects of zakat in an interest-free economy. Column 5 shows the wealth multiple in each year for the two groups.

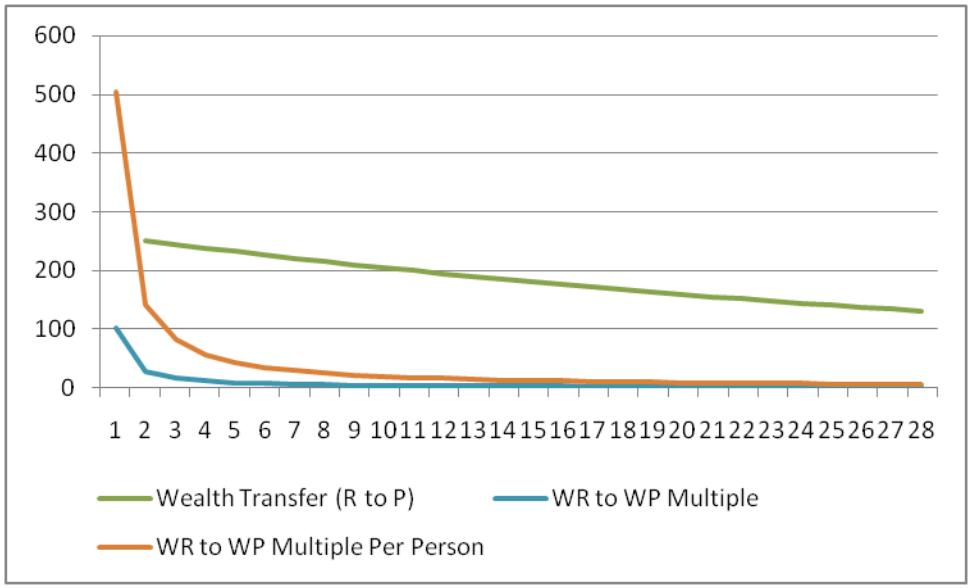
Table 9. Numerical Simulation of Wealth Redistribution under the Zakat System

Year	W_R	Wealth Transfer (R to P)	W_P	W_R to W_P Multiple	W_R to W_P Multiple Per Person
0	10,100.00		100.00	101.00	505.00
1	9,850.00	250.00	350.00	28.14	140.71
2	9,606.25	243.75	593.75	16.18	80.89
3	9,368.59	237.66	831.41	11.27	56.34
4	9,136.88	231.71	1,063.12	8.59	42.97
5	8,910.96	225.92	1,289.04	6.91	34.56
6	8,690.68	220.27	1,509.32	5.76	28.79
7	8,475.92	214.77	1,724.08	4.92	24.58
8	8,266.52	209.40	1,933.48	4.28	21.38
9	8,062.36	204.16	2,137.64	3.77	18.86
10	7,863.30	199.06	2,336.70	3.37	16.83
11	7,669.21	194.08	2,530.79	3.03	15.15
12	7,479.98	189.23	2,720.02	2.75	13.75
13	7,295.48	184.50	2,904.52	2.51	12.56
14	7,115.60	179.89	3,084.40	2.31	11.53
15	6,940.21	175.39	3,259.79	2.13	10.65
16	6,769.20	171.01	3,430.80	1.97	9.87
17	6,602.47	166.73	3,597.53	1.84	9.18
18	6,439.91	162.56	3,760.09	1.71	8.56
19	6,281.41	158.50	3,918.59	1.60	8.01
20	6,126.88	154.54	4,073.12	1.50	7.52
21	5,976.20	150.67	4,223.80	1.41	7.07
22	5,829.30	146.91	4,370.70	1.33	6.67
23	5,686.07	143.23	4,513.93	1.26	6.30
24	5,546.42	139.65	4,653.58	1.19	5.96
25	5,410.26	136.16	4,789.74	1.13	5.65
26	5,277.50	132.76	4,922.50	1.07	5.36
27	5,148.06	129.44	5,051.94	1.02	5.10

Source: Author's Computations (2016)

It can be seen that after around 27 years, the wealth multiple will drastically decrease from 101 to almost 1, for the two groups as a whole. Column 6 shows the wealth multiple per person. It can be seen that wealth multiple will become only 5

after 27 years from the initial value of 505. Eventually, the wealth recipients will become ineligible for zakat receipts, and on the contrary, they will become part of the zakat payer group. It can be seen from Figure 1 that the wealth multiple as a group and on per person basis declines as time passes. Wealth transfer is greater when there is relatively higher inequality and declines as inequality reduces in the economy.



Source: Author (2016)

Figure 1. Wealth Inequality and Zakat (Result of Numerical Simulation)

CONCLUSION

In this study, we found that zakat to GDP ratio exceeds the PGI-GDP ratio in 14 of the 17 enrolled countries with poverty line defined at earnings of $1.25 a day. Only in Bangladesh, Mozambique, and Nigeria, the zakat to GDP ratio was less than the PGI-GDP ratio, with the poverty line defined at $1.25 a day. We also discovered that the zakat to GDP ratio exceeds the PGI-GDP ratio in 13 of the 17 countries when the poverty line was defined at $2.00 a day. Only in Bangladesh, Mozambique, Nigeria, and Pakistan, the zakat to GDP ratio was less than the PGI-GDP ratio, with the poverty line defined at $2.00 a day. Our empirical analysis also showed that the zakat to GDP ratio exceeds the PHCR-GDP ratio in 12 of the 17 countries, with the poverty line defined at $1.25 a day. The countries in which zakat to GDP ratio was less than PHCR-GDP ratio with poverty line defined at $2.00 a day were Bangladesh, Mozambique, Nigeria, Pakistan, and Tajikistan. We also found that the zakat to GDP ratio exceeds the PHCR-GDP ratio in 10 of the 17 countries with poverty line defined at $2.00 a day. The countries in which the zakat to GDP ratio was less than the PHCR-GDP ratio, with poverty line defined at $2.00 a day, included Bangladesh, Indonesia, Kyrgyz Republic, Mozambique, Nigeria, Pakistan, and Tajikistan. Hence, we conclude that the institution of zakat has ample potential to contribute towards poverty alleviation. Our analysis also revealed that the aggregate resources pooled

together from the potential zakat collection in 17 OIC countries will be sufficient to fund resources for poverty alleviation. Thus, OIC can collaborate with other member countries to transfer necessary resources from regions with zakat surplus to the regions that have zakat.

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