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involvement of rich people to zakat in many countries and the lack of a government organization to collect the zakat. Our analysis is more applicable for countries where zakat is obligatory and the government takes the task of collecting and distributing it.

V. CONCLUSION AND RECOMMENDATION

In this study, a mathematical model is proposed for the first time to predict wealth transform between the rich and the poor in favor of the poor. The time to reach a level where poverty is totally eliminated from the society can also be determined by the model. A continuous model in the form of a differential equation is suggested. By the aid of mathematical solutions and numerical simulations, it is shown that zakat is an effective tool to eliminate poverty in a heavily populated Muslim country. This conclusion is in parallel with the findings of previous mentioned work that zakat implementation has positive effects on the economy and wealth distribution.

The model needs real data for extrapolating the wealth distribution in a country which can be officially demanded from the governments. The related parameters should be inserted into the model to predict the time when poverty can be eliminated from the society.

Further studies and improvements can be possible for the present work. The simple model proposed can be developed in a number of ways. Instead of a constant earning rate, a time dependent variable rate with a prescribed function of time can be taken. The numerical calculations can be repeated with real data. Instead of a continuous model, an equivalent discrete model can also be proposed.

REFERENCES

- Abdullahi, S. I. (2019). Applications of operation research in zakah administration, *Journal of Research in Emerging Markets JREM*, 1(3).
- Ganiyev, A. & Umaraliev, S. (2020). The role of zakat in the early stages of the Islamic Civilisation, *EPR International Journal of Multidisciplinary Research*, 6(6), 441-444.
- Hasbi, M. Z. N. & Widayanti, I. (2022). Zakah contribution for community economic development with analytical networking process method, *Bulletin of Islamic Economics*, 1(1), 39-49.
- Namdar, N., Hassanzadeh, R., Moradi, M., Mohmodian, Y & Shahdani M. S. (2021). Developing a mathematical equation to predict khums and zakat in the Iranian economy, *International Journal of Zakat*, 6(2), 43-62.
- Norulazidah, D. H., Omar Ali, P. H. & Myles, G. D. (2010). The consequences of zakat for capital accumulation, *Journal of Public Economic Theory*, 12(4), 837-856.

- Pakdemirli, M. and Boyacı, H. (2007) Generation of root finding algorithms via perturbation theory and some formulas, *Applied Mathematics and Computation* 184, 783-788.
- Powell, R. (2010). Zakah: Drawing insights for legal theory and economic policy from Islamic jurisprudence, *Pittsburgh Tax Review*, 7, 43-101, 12-31.
- Putri, L., W. (2017). Mathematical model of zakat for poverty reduction, Undergraduate thesis, Padang State University.
- Putriani, D., Ghani, G. M. & Kartiwi, M. (2020). Exploration of agent based simulation: The multiplier effect of zakah on economic growth, *Journal of Islamic Monetary Economics and Finance*, 6(3), 667-688.
- Razak, M. I. M., Omar, R., Ismail, M. & Hamzah, A. S. A. (2013). Overview of zakat collection in Malaysia: Regional Analysis, *American International Journal of Contemporary Research*, 3(8), 140-148.
- Rizal, S. & Adibah, N. (2022). An evaluation of the impact of zakah and Islamic financial instruments on economic growth, *Muqtasid*, 13(1), 31-46.
- Rusydia, A. S. & Al-Farisi, S. (2016). The efficiency of zakah institutions using data envelopment analysis, *Journal of Islamic Economics*, 8(2), 213-226.
- Selim, M. & Farooq, M. O. (2020). Elimination of poverty by Islamic value based cooperative model, *Journal of Islamic Accounting and Business Research*, 11(5), 1121-1143.
- Subekti, R., Abdurakhman, A. & Rosadi D. (2022). Can zakat and purification be employed in portfolio modelling, *Journal of Islamic Monetary Economics and Finance*, 8, 1-16.
- Subhan, M. (2018). A mathematical model of economic population dynamics in a country that has optimal zakat management, 2018 IOP Conference Series: Materials Science and Engineering, 335, 012051.
- Wahid, A. A., Dinda, I. T. & Widiastuti, T. (2017). Zakat as an Obligatory System and its Implications for Social Psychology of Society (Social Tafsir of Sūrah Al-Tawbah: 103). *International Journal of Zakat*, 2(2), 43-53.
- Wali, H. N. (2013). Utilization of Zakat and Islamic Endowment Funds for Poverty Reduction: A Case Study of Zakat and Hubsu Commission, Kano State-Nigeria. *Journal of Economics and Sustainable Development*, 4(18), 141-147.