Was Pareto right? Is the distribution of wealth thick-tailed?

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Extended abstract

This paper revisits the old question about the shape of the distribution of wealth among households and specifically asks whether the tail of the wealth distribution can be modelled by a Pareto distribution or whether alternative distributions are better suited. Since Pareto's (1964) influential work, thick tails have been documented and used in the modelling of waves, city sizes, finance (Bouchaud et al. 2004) and technology adoption (Meade & Islam 2006, Kishi 2019). See Gabaix (2016) for an extensive overview. Whether the wealth distribution exhibits a thick tail – what we will call the Pareto hypothesis (PH) – and if so how thick this tail is and how its shape changes along the distribution, is important for three reasons. First, there is a growing empirical literature relying on the assumption of a Pareto tail in its analysis. Examples include adaptations of wealth survey data for missing top wealth observations (Advani, Bangham & Leslie 2020, Bach et al. 2018, Eckerstorfer et al. 2016, Vermeulen 2016, 2018, Wildauer & Kapeller 2021, 2022), wealth tax revenue estimations (Advani, Hughson & Tarrant 2020, Kapeller et al. 2021, Tippet et al. 2021, Krenek & Schratzenstaller 2022, Apostel & O'Neill 2022) and the Distributional National Accounts (DINA) literature which aims at producing micro data sets which are consistent with national aggregates (Piketty et al. 2018, Blanchet et al. 2021, Garbinti et al. 2018, Waltl 2022, Jenkins 2016, Chakraborty et al. 2019). For all of these papers the validity of the Pareto hypothesis is a key assumption. Second, modelling tax policy for both wealth and top income taxation is crucially influenced by the presence of thick tails (Saez 2001, Saez & Stantcheva 2016, 2018). Thirdly, the Pareto hypothesis can inform our theoretical understanding and modelling of wealth accumulation. The existence of Pareto tails is often interpreted as evidence for a complex underlying process (Caiani et al. 2016). If the Pareto hypothesis holds, we should focus on those (complex) mechanisms that allow for the result of thick tails in favour of those which don't. Multiplicative processes such as income from capital are an example for a key building block in models explaining Pareto tails (Benhabib & Bisin 2018, Newman 2006, Caiani et al. 2016, Delli Gatti et al. 2011). Confirming the Pareto hypothesis supports the focus and further development of such models.

It is against this background that we test the Pareto hypothesis and analyse the nature of the US wealth and income distribution. Compared to previous tests of the Pareto Hypothesis we are using significantly more and better-quality data. The Survey of Consumer Finances covers the entire US population (rather than the Forbes 400 list) and as a result wealth in our sample of the most affluent 10% of households still spans three orders of magnitude rather than one like on the Forbes 400 list. In addition, by fitting a type II Pareto distribution, we relax the scale invariance assumption, made by most previous studies and we correct for the SCF's exclusion of the richest 400 US households from its sample design by using Wildauer & Kapeller's (2022) rank correction approach. Altogether, this allows us to conduct a more powerful test of the Pareto hypothesis compared to the existing literature.

We find that the Pareto type II distribution provides the best fit and consistently outperforms the log-normal, exponential, and Pareto type I distributions. Using an estimator developed by Castillo and Hadi (1997) for the Pareto type II distribution, the distributions are compared in a pairwise manner for different cutoffs. This methodology can be extended to the wealth distributions of other

countries and we argue that our results support the practice of modelling wealth distribution tails with Pareto distributions in the absence of reliable data.

The fact that our results provide strong support for the Pareto type II distribution over the type I distribution is significant for several reasons. First, it emphasizes that the distribution of wealth does not exhibit the self-similar or fractal nature as implied by the type I distribution. Instead our results indicate that the extent of wealth inequality falls up to the 98th percentile but increases within the most affluent 2% of US households. Second, the dominance of the type II distribution raises important questions about simple theoretical models used to model the evolution of wealth distributions. Standard frameworks based on multiplicative processes with a reflection barrier or Keston processes might need to be refined or expanded in order to explain the increasing degree of inequality documented in the data.

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