An excellent article "The Inescapable Casino", written by a professor of mathematics is definitely worth reading.

https://www.scientificamerican.com/article/is-inequality-inevitable/ The article shows how-physics and mathematics can describe the distribution of wealth in modern economies with unprecedented accuracy. Oxfam estimates that today some 26 individuals possess as much household wealth as the lower half of the world's population combined---over 3.5 billion people! Statistics indicate that the rich are increasingly concentrating more wealth. Between 1989 and 2016, the US has become more unequal and now has the highest inequality in the "developed" world. Presently 14 European countries also fall into an oligarchy state (power in the hands of the top 1%).

"The free market is essentially a casino that you can never leave." The longer you stay in the casino the more likely you are to lose, and inequality inevitably grows due to the well documented multitude of systemic biases favoring the wealthy. If the economy is unequal to begin with the wealth of the poorer will decrease and be transferred to the wealthier. Mathematical models demonstrate that the natural inclination of wealth is to flow upward in a "free" market capitalist economy. Once there is some variance in wealth, NO MATTER HOW SMALL, wealth will move from poorer to richer. Inequality INEVITABLY grows more pronounced. There is a systematic inherent unfairness as the top 1% takes a greater and greater share of social wealth, and only redistribution sets the limits on inequality.

The professor of mathematics at Tufts University writes that conflating the concept of the free market with the notion of Freedom is a mistake. The "free" market gives rise to economies that are anything but free and fair. In fact, the inequality in free market economies INEVITABLY grows more pronounced.

## The Physics of Inequality:

Water has a dual state, either water or water vapor, depending on temperature. At the boiling point water turns into steam (water vapor) this sudden and dramatic change is called a "phase transition". Such jumping from one state to another is also known as quantum phase transitions which play a role in other areas of physics.

"Free" market capitalist economic systems exhibit quantum phase transition. If the **wealth** of society is substituted for the **water**, then wealth can quantum phase from a steam state—democracy, to a water state--oligarchy (Power in the hands of a small dominant class, the 1%). Mathematics demonstrates that this quantum phase occurs when the ratio of the wealth bias over the wealth redistribution (WB/WR) is greater than one. In other words, when the forces of wealth attained advantages (bias), exceeds the forces of democratic wealth redistribution. Wealth attained advantages are: privatization, deregulation, lower taxes for corporations and the rich, tax loopholes, corporate subsidies, inheritance, etc. Forces of redistribution are: Public services, debt forgiveness, government programs, subsidies, progressive taxation, regulations, higher wages and benefits etc.

At a particular cooling of political temperature, when the inevitable forces of inequality sufficiently weaken the forces of democratic redistribution there will be a sudden condensation of wealth to the top

1%--a phase transition to a state of oligarchy. For example in 1991 Russia suffered the politics of shock therapy economics with sudden privatization and deregulation. Russia became an oligarchy almost overnight, plunging the working class into poverty. The author states that it is "only redistribution that sets limits on inequality". The question is: Can we *escape* the limits of inequality?

Continuous heat can boil away all the water resulting in a complete state of steam. The same holds true for economies of class inequality. Sustained political heat from the working classes has the potential to push not only for greater wealth redistribution, but also to **reduce the wealth bias to zero and abolish** any wealth advantage. This would be *a quantum leap to a qualitatively new economic system* of social, economic and political equality.—an Egalitarian Society.

Mathematics and Physics point the way to the possibility of ---the greatest escape of all, the escape from inequality.

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