

Opinion – The Economic Flaws in Elon Musk's Mars Colonization Plans

Written by John Hickman

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JOHN HICKMAN, FEB 12 2021

Elon Musk's Space X wants to land humans on Mars by 2026. That matters because Musk's vision of humans as a multi-planet species with a reduced risk of extinction from a catastrophe on Earth is smart. Spreading your risks is rational if survival is your goal. Musk is a visionary, and he does know that colonizing the Red Planet will likely require a fleet of reusable spaceships, a vast investment of capital that may never be recouped, brave pioneers willing to die in the adventure, and eventually a resident population that feels like Mars is home. However, what Musk does not know is how his settlers will make money on Mars that can be spent back on Earth.

Musk's recent tweets show that he understands the daunting chicken and egg problem of establishing an extraterrestrial colony. Successful colonization on Earth has always benefited from precursors in some form. Before the Modern Era, meaning prior to 1500 AD, it always depended on the existence of life being already present. Since the Modern Era, it almost always depended on the existence of pre-existing human habitation. The Polynesians who would become the Māori could colonize uninhabited New Zealand/Aotearoa because plant and animal life were already there in abundance and the British could colonize New Zealand/Aotearoa because the Māori were already there to trade with. Neither the Māori nor the British had to solve the chicken and egg problem.

About half my money is intended to help problems on Earth & half to help establish a self-sustaining city on Mars to ensure continuation of life (of all species) in case Earth gets hit by a meteor like the dinosaurs or WW3 happens & we destroy ourselves

— Elon Musk (@elonmusk) October 12, 2018

Settlers on Mars will have to bring everything but the minerals they mine with them. All of the labor, capital and technology necessary to establish an economy to produce everything they will need – including atmosphere to breathe – will have to be hauled there 80 million miles from Earth. Sufficient numbers of people and large amounts of material will have to arrive at roughly at the same time. Musk has promised to spend either all of his wealth except company stock or one-half of his money to that end. Whether that would be enough is unclear but it acknowledges that daunting problem.

A minimally self-sustaining colony might mean a breeding population of 50 people living in a campus of underground tunnels, which sounds impressively claustrophobic on several levels. Musk, however, has talked about a city of one million living on the surface under glass domes – a scenario that has been dramatized in the book and TV series *The Expanse*. That would certainly be more pleasant, but scaling up the population with housing less likely to induce affective disorders still does not solve two related problems of economic viability.

Economic exchange between colonists on Mars is easy to picture, either as barter or mediated by scrip offered by Musk's company store. However, if they use currency from Earth they are likely to discover that there is no correspondence between what it will buy on Mars and back on Earth. That is the shadow of the problem likely to cripple trade between the two worlds: they cannot share a currency. That is because communication will be much cheaper than transportation over interplanetary distances. Once the first direct digital manufacturing machinery is

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set up, any commodity or capital good reducible to digital information, which is to say almost everything in the decades to come, would be less expensive to transmit for production on arrival than to haul between planets.

Money performs many tasks but the most important is solving the problem of identifying the double coincidence of wants that causes friction in barter. Money solves that problem on Earth but that would be impossible between worlds because there is nothing material – no basket of physical commodities – on which to determine its common value. Not only have humans never faced a complete chicken and egg problem of colonization but they have never engaged in trade exclusively on the basis of communicated information. Arbitrary currency values imposed by a company store or colonial government on Mars could be only temporary solutions because efforts to escape their clutches would cause the sort of economic inefficiencies exposed by informal markets. Nor would cryptocurrency fix the problem because the prices for electricity to produce them would be unrelated on Mars and Earth. Interplanetary trade would have to be conducted by bartering information for information.

Consider how that would constrain the decision to emigrate to the Red Planet. Exploring and extreme sports would attract scientists and athletes, small numbers of whom become settlers. But why would the superrich looking for a bolt hole from future catastrophe chose Mars City or Muskopolis over somewhere remote on Earth where breathing the atmosphere is at least free? The super rich will likely be discouraged from emigrating by the difficulty of moving wealth back and forth between worlds. The absence of a common currency would desiccate their liquidity. They tend to be highly attuned to financial exit options to evade taxation. Mars would likely look like a trap. The ambitious and creative would recognize that emigrating would deprive them of both instantaneous and personal contact with much larger communities of the comparably talented. Mars is not just 80 million miles away from Earth, it is also three hours and 22 minutes away in radio signal delay time. Relative isolation would put them at a competitive disadvantage in selling their work and would be burdened by the transaction cost of determining its value in the absence of a common currency.

Now consider how all of that might make Mars an economic basket case. Modern history shows that settler colonies were successful only after they developed a profitable export commodity or proved useful for provisioning military and commercial shipping: beaver pelts rather than religiosity for Massachusetts and a location between Holland and the Dutch East Indies rather than spectacular scenery for Cape Town. Mars will lack a physical commodity worth exporting. Mars might export information products but at a profound disadvantage because it would be trading with a vastly larger population of information product producers back on Earth. Moreover, Mars would have no locational value other than as destination because there is no reason for a spaceship to stop there on the way from Earth to anywhere else.

The scientific and engineering challenges of establishing an extraterrestrial human settlement are daunting enough but solving the attendant economic problems may be even more difficult. As the historical experiences of Canada and Australia show, colonies on Earth often struggled to attract and keep settlers and their descendants. Mars will need to offer more than the promise of climbing Olympus Mons or the philosophical satisfaction of serving in a species extinction backup plan to make it economically viable. Elon Musk doesn't know what it is.

About the author:

John Hickman is Professor of Political Science at Berry College, where he teaches International Relations and Comparative Politics. He is the author of *Selling Guantanamo* and *Space is Power: The Seven Rules of Territory*. Prior to his current position, Hickman served as a Woodrow Wilson Fellow at Florida A&M University. He can be followed on Twitter: @JohnHic34063021.