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## Trillions Greater Than Billions

In an early blog during the pandemic (April 2, 2020), Your Blogger asked the question “how many ventilators is enough?” Readers will remember that New York State was asking for 40,000 ventilators to treat the enormous number of cases. There was also a shortage of hospital rooms. YB asked how we look at this kind of a “peak load” problem. He argued against massive reserves of ventilators or hospital rooms, saying that given the potential benefits, it was extraordinarily hard to procure and to maintain such reserves. In fact, New York State did not really need 40,000 ventilators, and the hospitals, although terribly stressed, turned out to be largely adequate for the treatment.

At the International Health Economics Association meetings this week, Nobel Laureate Economist Michael Kremer addressed a similar problem. He noted that even with the remarkably fast development of vaccines against COVID-19, we had profound supply shortfalls in producing the drugs (and YB would note, even more profound problems in delivering them). Recognizing that over 7 billion people in the world are at risk from COVID-19, he quoted an International Monetary Fund estimate of \$500 billion of economic losses per month due to COVID-19. Multiply that by 12 months (give or take a month), and it leads to at least \$6 TRILLION of losses per year. That is about 30% of the annual United State Gross Domestic Product (GDP).

Professor Kremer argued for increased reserve production capacity for the possibility of pandemic. Even with production ramping up, it could take a year or two or three to vaccinate everyone, with the attendant \$500 billion per month of losses. His estimated pandemic probability of 2% per year implies that we could expect one pandemic every 50 years. Unlike building highways to address local traffic congestion, this is a pollution externality that impacts the whole world. Comparing marginal benefits of capacity to the marginal costs of “having the capacity” [YB’s term], Kremer noted that “trillions [benefits] are bigger than billions [costs].” Clearly, the world needs more capacity.

This is a world-wide externality. As long as travelers can ride thousands of miles on jet planes, or traverse international borders, pandemic viruses will spread. With the exception of Draconian travel limitations into Australia and New Zealand (creating their own bubble), no country has been safe. Even then, histories of the Spanish Flu note that Australia was safe from the flu until World War I soldiers came home. Then they were smacked, with more than 12,000 deaths.

Indeed, trillions are bigger than billions. YB agrees with this. Yet, the same questions remain about procurement, and maintenance as were brought up about ventilators or hospital beds. How does one design the necessary production capacity so that we can ramp it up quickly? Who gets paid to maintain it? This is almost certainly a government responsibility, because the

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private market will not provide enough capacity to address a negative externality of the COVID-19 type.

How does one convince a public that will not pay for needed roads and bridges to provide surplus vaccine production capacity? What happens when politicians ten, twenty, or thirty years from now look at the surplus production capacity and declare that it is too expensive, and must be shut down or sold off to the private sector?

YB is convinced by the “trillions greater than billions” argument. Are the world’s decision makers similarly convinced?

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