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WHAT IS THE BUTTERFLY EFFECT

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ABSTRACT:

The butterfly effect in economics refers to the compounding effect of small changes in surrounding. The changes are so small that it is almost impossible to make accurate predictions for the future or to identify the precise cause of the reflective change. The butterfly effect causes sudden declines. But the changes continually occur during long period of stability. The "butterfly effect" is basically a part of chaos theory which describes how a small change in initial conditions can lead to dramatically different outcomes in complex systems, famously illustrated by the idea that a butterfly flapping its wings could cause a hurricane.

KEYWORDS: Butterfly Effect, Alexander Fleming, Penicillin, Mohammed Ali Jinnah, Premjibhai Meghji Thakkar, Gujrati Lohana, Interwoven-World, Chaos theory, Subprime Crisis, Lehman Brothers, Small Occurrences, VUCA, Coca Cola, IL&FS.

The butterfly effect grants the power to cause a hurricane in China to a butterfly flapping its wings in New Mexico. It may take a very long time, but the connection is real. If the butterfly had not flapped its wings at just the right point in space/time, the hurricane would not have happened. The "butterfly effect," popularized by meteorologist Edward Lorenz, is a metaphor illustrating how small, seemingly insignificant changes in initial conditions can lead to large, unpredictable outcomes in complex systems like weather, not specifically a hurricane in China.

Lorenz explained that a butterfly's wing flap represents tiny atmospheric changes. These don't create typhoons but can alter their paths. As these small changes compound in complex systems, they can have massive implications. Lorenz concluded this makes weather prediction impossible.

Because we can never know all the initial conditions of a complex system in sufficient detail, we cannot hope to predict the fate of a complex system. Even slight errors in measuring the state of a system will be amplified dramatically, rendering any prediction useless. Since it is impossible to measure the effects of all the butterflies in the World, accurate long-range weather prediction will always remain impossible.

A probable Indian example of the butterfly effect could be the IL&FS crisis, where a seemingly small issue with non-performing assets (NPAs) led to a larger liquidity emergency and defaults within the non-banking financial sector (NBFCs). The IL&FS crisis, which began in 2018, involved the financial collapse of Infrastructure Leasing & Financial Services (IL&FS), a major Indian NBFC. The initial problem was a decline in the value of IL&FS's non-performing assets (NPAs), which are assets that are unlikely to be repaid. This decline in NPAs led to a loss of confidence in IL&FS and other NBFCs, causing a liquidity crisis. The crisis resulted in a major liquidity emergency in India, with other NBFCs facing defaults and a broader impact on the financial system.

One of the most famous examples of the butterfly effect in business is the story of the Coca-Cola Company. In 1985, they decided to change the formula of their famous drink, releasing

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the “new Coke”. However, this change was not appreciated by the market, and consumers expressed their dissatisfaction. Coca-Cola released a reformulated version of its drink, is a classic example of the "butterfly effect" in business, demonstrating how a seemingly small change (the new formula) led to a major, negative impact. Coke had to face consumer backlash and a return to the original formula.

This example of butterfly I like the most. Alexander Fleming accidentally created a Mould juice. Instead of throwing it out, he experimented with it which created Penicillin. In 1928, scientist, Alexander Fleming, discovered mould (fungi) growing in an unused petri dish. He noticed dying bacteria near the mould, on closer examination Fleming chose not to throw it out. Later, on additional investigation, Fleming identified the mould as part of the Penicillium genus, which is effective against pathogens responsible for scarlet fever, pneumonia, and more. He named his discovery as Penicillin. Alexander Fleming could have chosen to throw the mould petri dish out, but his choice to instead investigate further created a butterfly effect that impacted the World.

The butterfly effect suggests that while a small action like choosing to use bicycles may not have a linear effect on carbon emission, but in longer run, that could still alter trajectory of climate change in a big way. Bicycles are widely used for transportation in cities and villages; bicycles have tiny manufacturing footprints compared to other automobiles. Riding a bicycle can improve your mental and physical health and wellbeing. Riding a bicycle is great exercise and increases cardiovascular fitness. And maintaining a bicycle is easier.

I feel this historical example is most profound to explain butterfly effect. It’s about Mohammed Ali Jinnah. His paternal grandfather was Premjibhai Meghji Thakkar. He was a Hindu Lohana from Paneli village in Gondal State in Kathiawar, Gujarat, who converted to Islam for the sake of his occupation. Premjibhai Thakkar entered the trading of fish within the coastal town of Veraval. His business, however, clashed with the strong vegetarian moral ethics of the Lohanas and as a result he was ostracised from the community. He made enough money in this trade and attempted to rejoin the community. He also discontinued his fish business. However, the narrowminded Lohana leaders, did not accept his request. Think about the course of history, if they had no inflated egos and had welcomed him back, we would have united India i.e Present India, Pakistan, and Bangladesh. Mohammed Ali Jinnah was fundamentally secular. He primarily drew on the liberal language of rights, interests, and representations and was extremely uncomfortable with M.K. Gandhi’s bringing of religious values to and support of religious causes in the public sphere. Jinnah’s backing of a political identity in the name of Islam indicates a continuation of his overall belief in the secularization of religion. Often, I feel Jinnah is misunderstood, and in his later political life he was pushed into separating India-Pakistan by Nehru & Gandhi. If Jinnah's grandfather would have been allowed to come back to his Lohana Gujrathi caste and religion, Jinnah would have remained a Hindu, and partition of India – Pakistan wouldn’t have occurred. The history shows that the creation of a new country was a “Butterfly Effect” of the stubborn attitude of the Hindu priests.

In 2007, when bankruptcy was inevitable, most financial and banking entities did not fully realize its impact, despite many companies going bankrupt before Lehman Brothers due to the subprime mortgage crisis. If the company didn't fall earlier with all the slipups it had been taking, it was because it still held $63 billion in assets before the bankruptcy. Hence, when it finally collapsed, the New York Stock Exchange crashed, recording the worst single day drop in history. The crashing effect on NY Stock Exchange which destabilized the US financial markets, the bankruptcy of Lehman Brothers had a butterfly effect on the rest of the world. Consequently, the global economy experienced a violent recession in the markets that

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exposed financial cacophony in the following months. The financial turmoil caused serious dysfunction in financial and capital markets. It gave a severe blow to the world economy, which fell into a global recession.

CONCLUSION:

Butterfly theory is based on chaos theory which is an interdisciplinary area of scientific study and branch of mathematics. It focuses on underlying patterns and deterministic laws of dynamical systems are highly sensitive to initial conditions. In conclusion, the butterfly effect rests on the perception that the world is deeply interconnected, such that one small occurrence can influence a much larger complex system. Chaos theory is taught in mathematics; it describes the qualities of the point at which stability moves to instability or order moves to disorder. Butterfly effect is most common in today VUCA world. The "VUCA world" refers to a business environment characterized by Volatility, Uncertainty, Complexity, and Ambiguity, requiring people and organizations to be adaptable and resilient to thrive.

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