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## AN AMPLITUDE-FREQUENCY FRAMEWORK FOR CORPORATE ENTREPRENEURSHIP (INTERACTIVE PAPER)

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**INTERACTIVE PAPER SESSION**

**AN AMPLITUDE-FREQUENCY FRAMEWORK  
FOR CORPORATE ENTREPRENEURSHIP**

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**Principal Topic**

When a company pursues entrepreneurial initiatives targeting innovation, it often faces two strategic questions – what *magnitude* of entrepreneurial events should it pursue, and with what *frequency* should these innovations occur? We introduce an analytical framework, based on systems-engineering principles, that guides these twin decisions, allowing companies to benchmark their entrepreneurial initiatives against their industry cohort. The key observable outputs – frequency and amplitude – are key inputs into the mathematics characterizing a sinusoidal curve. Adopting this framework gives companies an analytical model to benchmark its profile against the industry curve before it commits to its corporate entrepreneurship strategies, thus informing its decision-makers and minimizing wasted resources in capital, time, and labor as well as avoiding confusion of strategic direction.

**Method**

A sinusoidal curve can be represented by the function  $y=A \sin (Bx)$ , where A describes the amplitude and  $1/B$  describes its frequency. From this basic starting point, we define *amplitude* in the context of corporate entrepreneurship along a spectrum, with the lowest magnitude assigned to projects focused on incremental improvements and the highest magnitude assigned to projects which result in the creation of completely new products/services. *Frequency* in this context is defined as the time required to implement entrepreneurial projects from start to finish. Our research uses patent filings in electronics and telecommunications companies to calibrate the initial mathematical model. Our preliminary analysis shows that there are distinct families of sine curves which characterize different industries, as well as properties of these waves which characterize companies at different stages of growth.

**Results and Implications**

Larger companies in mature industries tended more towards low-frequency and low-amplitude sine curves, while early stage companies tended towards high frequency and low amplitude. We posit that, since so many changes are occurring both within the company and within the marketplace, younger companies need a high-frequency strategy to gain rapid feedback from the marketplace, “fail quickly” if their innovation is not a success, and pursue high-amplitude projects only after receiving resource infusions. Subsequent research will expand on this concept mathematically and will explore other aspects of the sine curve (such as negative amplitude and pulse waves) to better develop more detailed graphical models for benchmarking corporate entrepreneurial behavior.

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