**Rock Star** Theory

How to Explain and Predict Entrepreneurial Success

G. Christopher Crawford, PhD is Assistant Professor of Professional Practice of Entrepreneurship, Strategy, and Management at Rutgers Business School in Newark and New Brunswick. His research focuses on entrepreneurship and new venture growth, with a particular interest in studying how the largest, fastest-growing companies develop and evolve. In recent work, he models the emergence of outliers – whom he brands ‘Rock Stars’ – as a universal theory for both academia and mainstream culture. Based on his research of more than 12,000 companies, he has developed the ‘Rock Star’ Theory: a conceptual framework that delves into the factors that drive the performance of the most successful individuals and businesses.

**THE EMPIRICAL REALITY OF SOCIAL SYSTEMS: POWER LAW DISTRIBUTIONS**

In nearly all matters of life, when there are no limits on an individual’s or an organisation’s performance, distributions become skewed by outliers. Put another way, when system constraints are reduced and agents are allowed to perform at their best, outliers – and, subsequently, power law distributions – emerge. In a power-law distribution, most of the observations have very low values; the particularly high values, i.e. outliers, affect the shape and statistical properties of the entire distribution, resulting in a positively skewed asymmetric distribution with a long right tail, similar in shape to a child’s playground slide (see figure 1). Here, about 80% of the population falls below the statistical mean. Power law distributions are ubiquitous in social systems, such as business (e.g. market capitalisation, annual revenue, and number of employees), entertainment (e.g. album sales, movie receipts), politics (e.g. number of elections won), and social media (Twitter and Instagram account followers, TikTok and YouTube viewers).

Outliers are typically defined as observations that are markedly different from the rest of the sample. Under the assumptions of normal distributions, a positive outlier only occurs 0.1% of the time. However, from a power law perspective, outlier observations make up about 10-15x more than the bell curve would suggest. Even though they are relatively rare, outliers have the potential to exert disproportionate influences, particularly high values, i.e. outliers, affect the shape and statistical properties of the entire distribution, resulting in a positively skewed asymmetric distribution with a long right tail, similar in shape to a child’s playground slide (see figure 1).

Dr Crawford discusses how these findings challenge a long-held assumption that the normal (or Gaussian) distribution characterises the variables of interest. The traditional bell-shaped curve, a few observations are very good, a few are very bad, and most reside somewhere around the middle (i.e. the average or the mean); in normal distributions like this, every observation can be accurately characterised by the mean and some standard deviation from it. The normality assumption applies to social science research more generally, where it serves as the underlying statistical principle for data analysis, including hypothesis testing. Under this assumption, outliers are viewed as random, statistical anomalies (called “freaks”), and a common data processing practice is to have them cleansed from the dataset, thereby reducing the outlier’s true effects on the entire system.

As Dr Crawford points out: “Some of the most successful companies of our time, such as Apple, Amazon, Google, and Facebook, are extreme outliers that changed the nature of how we engage with the world – they transformed what we do and how we think.” He argues that these companies have a significant impact on businesses and society as a whole. Therefore, rather than ‘fixing’ or excluding these exceedingly influential anomalies from our theories and data analysis, we should turn the spotlight on them and probe their emergence.

**WHAT DO RICH BRANSON, STEVE JOBS, AND ELON MUSK HAVE IN COMMON?** In addition to being founders of multi-billion-dollar companies, they are also outliers. Outliers can be people, businesses, institutions, or events, depending on the specific context. Lying way outside the normal, outliers wield disproportionate influences on both the business world and society. Their inputs and outputs, either qualitative or quantitative in nature, are considerably more diverse from those of the rest of the population. Most often, an outlier represents an exception to the normal rules.

In this research, Dr. G. Christopher Crawford, Assistant Professor of Professional Practice of Entrepreneurship, Strategy and Management at Rutgers Business School—Newark & New Brunswick, models the emergence of outliers in entrepreneurship as a unifying theory for both academia and mainstream culture. He has closely examined more than 12,000 companies at various stages of development. They encompass a broad spectrum, ranging from small businesses employing only one or two people to behemoth companies boasting more than one million employees. Dr. Crawford and his collaborators are particularly interested in high-growth entrepreneurship, which is the hallmark of the largest, fastest-growing companies. Their aim is to dissect the success of these high-achievers, or ‘Rock Stars’.

**WHEN YOU EXPECT TO ACCOMPLISH THINGS THAT OTHERS CAN’T OR WON’T OR DON’T, YOU HAVE TO DO THINGS DIFFERENTLY OR DO DIFFERENT THINGS.**

First, Gladwell identifies how, while in high school, Gates routinely snuck out of his house at 1am in the morning to write code on one of the first computers in the world with a text-based user interface (as opposed to the normal punch cards) at the University of Washington campus; later, Gates used the capabilities he developed to found Microsoft and, subsequently, became the richest man in the world (at the time). Then, Gladwell recognises The Beatles’ White Album as the most critically acclaimed LP of all time. The cause, he proffers, is that the band

**THE FOUNDATION OF ‘ROCK STAR’ THEORY**

After finding power laws in all S&P 500 and INC 500 outcomes, Dr Crawford reviewed additional research on the causes of skewed distributions. He theorised that if the outcome variables assume a power law distribution, there would likely be input variables that were similarly skewed. An examination of data
Outlier effects occur when one observation is so influential that it changes a system's normal rules.

Dr Crawford's Rock Star framework is also being used to construct algorithms that could facilitate decision-making that increases the probability predicting outcomes. For firms hiring new employees, the algorithm could help select outlier candidates who could best help a company grow. For venture capital firms, the algorithm has the potential to predict the emergence of outlier ventures (e.g. 'unicorns'), startups with venture capital valuations above $1 billion). Given that venture capital has historically only been accurate to predict about 15% of the ventures that are wildly successful, the initial trials of the Rock Star algorithm's 94% success rate looks exceptionally promising.

**References**


**Personal Response**

What is the most exciting outcome of your research to date?

In 2012 I was investigating the causes of growth of entrepreneurial firms with a co-author but he bailed. So, for the next six days I worked nonstop analysing data on 11,000 ventures in three different datasets. Analysis showed the shape of the distribution of founders' expectations for future growth at the nascent stage of organising was identical to the outcome distributions of 1) emerged venture five years later, 2) young firms, and 3) hyper-growth firms. These identical power law distributions, across time and stage of venture development, suggested that expectations for growth was a universal driver of growth at multiple levels. After only sleeping about ten total hours, I submitted the paper literally one second before the deadline. The submission won a Best Paper Award in 2012, was the groundwork of my dissertation (which won a $20,000 Kauffman Dissertation Fellowship in 2019) and was the foundation – the first of ten total hours, I submitted the paper literally one second before the deadline. The submission won a Best Paper Award in 2012, was the groundwork of my dissertation (which won a $20,000 Kauffman Dissertation Fellowship in 2019) and was the foundation – the first of