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Why do people start new businesses despite high failure rates? A look at the manufacturing sector in the United States.

Abstract

This paper aims to explain why despite persistent low survival rates in businesses, high initial capital costs and risky business structures, entrepreneurs continue to open new businesses year by year, a pattern that can be seen across states and sectors. An expected utility maximization model is used to integrate tangible (financial gains and losses) and non-tangible (personal gains and losses) factors as an approach to model the perception and expectations of individuals. The model establishes the possibility of overconfidence and the subjectivity of assessments relative to each individual by the use of weight terms and ranges in financial rewards.

The model suggests that individuals do not make decisions solely based on financial payoffs. Instead, they make an overall assessment including non-pecuniary factors, which explains the phenomenon seen in the United States in regard to private establishment openings.

Introduction

The number of new businesses per year in the U.S. has steadily increased for more than seven years. In March 2019, the Bureau of Labor Statistics indicated that 733,825 new business establishments had been opened during the previous year, the highest recorded number at the time. From manufacturing businesses to retail establishments, the number of yearly openings since the great recession has not appeared to slow down, as year by year, new record numbers are reported by the Department of Labor.

This critical pattern is undoubtedly one of the most important characteristics that describe the dynamic and evolving economy in the nation. Nonetheless, behind a steady increase in the number of new businesses per year, a low survival rate across sectors and states raises questions regarding the feasibility of these new establishments, and the decision-making process that hints to the idea of entrepreneurs not being deterred by low chances of long-term success. For instance, while the average number of annual businesses openings between 2012 and 2016 was 664,979, the 5-year survival rate for the same period was 50.4%, indicating that the majority of businesses for any given year cohort will not be able to survive in the long run (Department of Labor, 2021).

Although representing the overall state of the private sector, this survival rate statistic maintains its low values when calculated for specific states or sectors. This paper introduces data regarding business openings and closings with the objective of exploring why entrepreneurs make what appears to be high-risk choices that could ultimately affect their financial future and personal integrity.

Business Openings and Closings

The BLS collects the number of business closings (establishments with no positive employment or with zero employment when compared to previous periods), and business openings (establishments with positive employment and no links to prior periods). By collecting this data, we can then calculate the survival rate across states and industries. Figure 1 and Figure 2 showcase the trends that will be talked about in this paper.

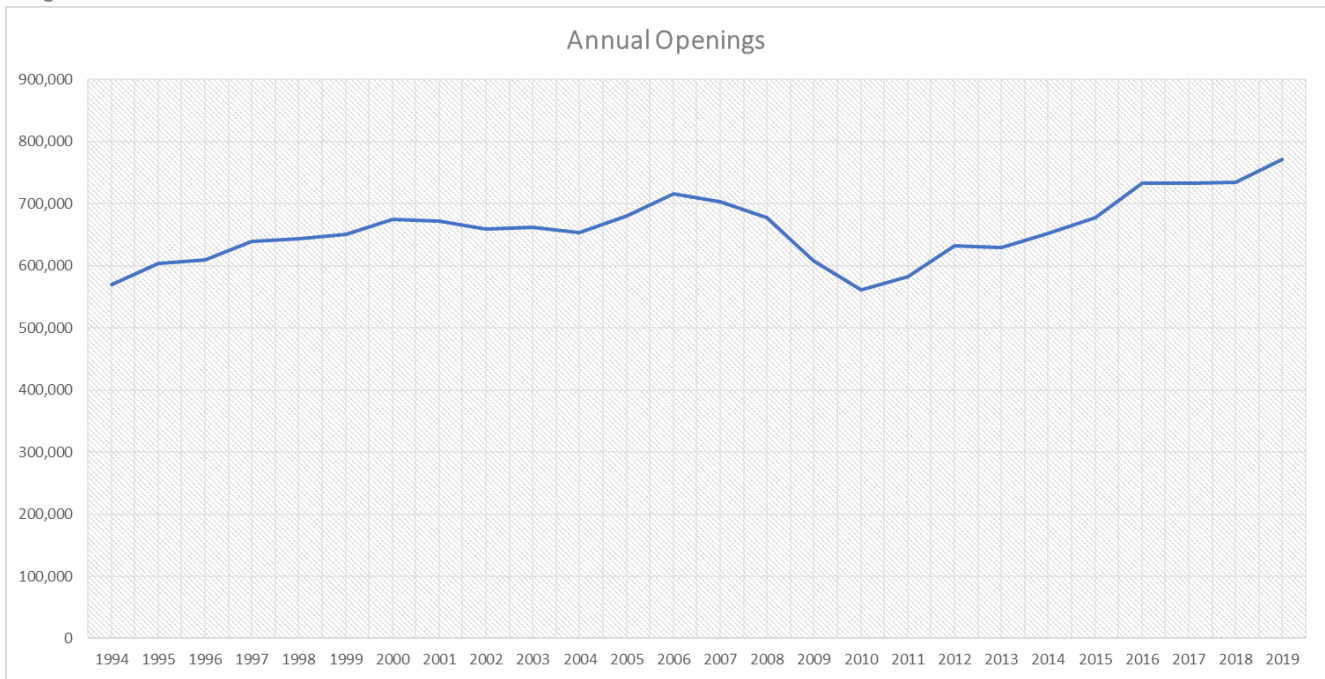


Figure 1: Annual business openings (Source: Bureau of Labor Statistics) Nationwide / All sectors included

Figure 2

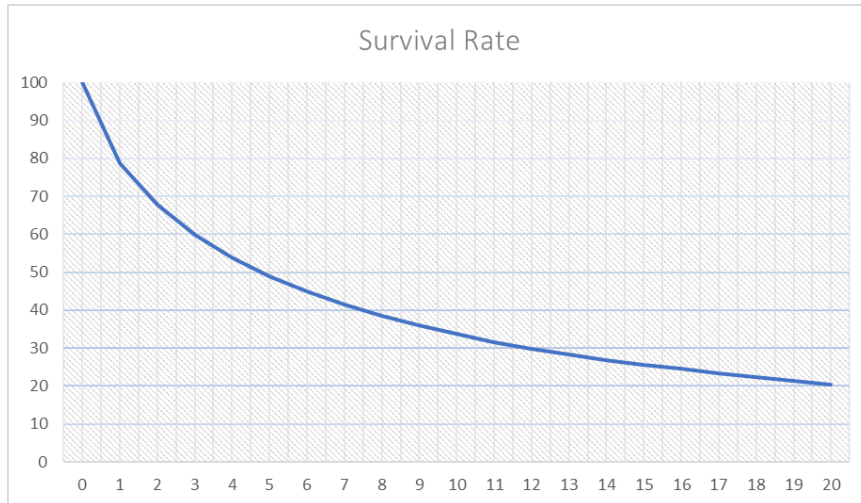


Figure 2: Average Survival Rate of Businesses (Source: Bureau of Labor Statistics) Calculated with 1994-2019 data. Nationwide / All sectors included

Number of Years After Opening	Survival Rate (Avg)
1	78.66
2	67.70
3	59.95
4	53.88
5	48.94
6	44.89
7	41.44
8	38.51
9	35.96
10	33.66
11	31.65
12	29.87
13	28.29
14	26.86
15	25.59
16	24.49
17	23.44
18	22.43
19	21.44
20	20.44

The matching process to keep track of births and deaths is possible due to the existence of State Employment Security Agency Identification Numbers. These identifiers are unique, and more than 95% of all businesses that employ at least one person have one, making the data a reasonable reflection of reality.

Initial Investment and Risks (Manufacturing Sector)

To highlight the apparent risk in opening a new business in a capital-demanding sector, we can take a look at the manufacturing sector. Any company involved in the mechanical, physical, or chemical transformation of components or materials are determined to be part of the manufacturing sector, as defined by the BLS. This part of the economy, although diverse in terms of the products produced, is characterized by the often strict regulations that have to be followed, the pricey machinery involved, and the planning cost before opening, resulting in a high amount of initial capital needed when compared to, for example, the retail or wholesale trade sectors.

According to data obtained from the 2012 Economic Census Data, we can notice the apparent initial investment needed for an average manufacturing business. Figure 3 showcases the dispersion of said amounts, indicating that personal savings might not be enough for an average person with the desire to open a business in this sector. The data raises questions regarding how people keep deciding on starting their own business despite high development costs, high failure rates, and a possibly intensive planning phase. This piece of data will become more relevant as other factors are explained (United States Census Bureau, 2012).

Figure 3

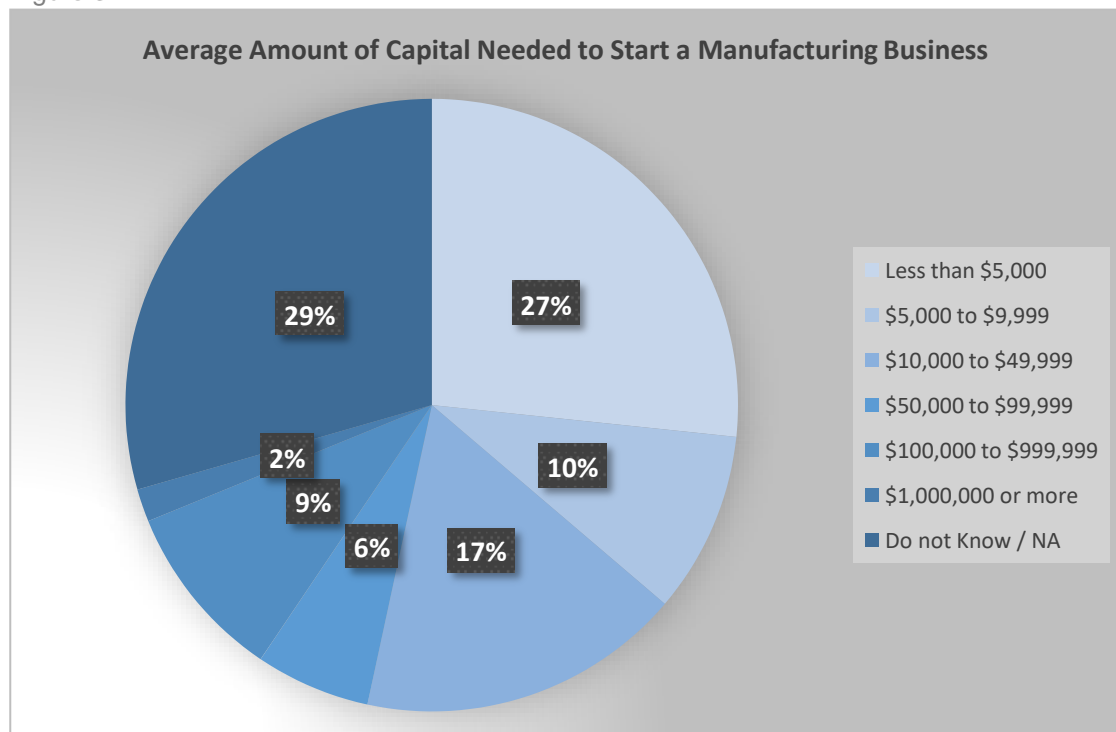


Figure 3: Capital needed to start a manufacturing business (Source: Census Bureau 2012). Data obtained from the Economic Census Data.

Business Structures, Initial Investment, and Liability Protections

Generally, when we talk about the potential risk involved in starting a new business venture, things such as loss of initial investment, loss of time, foregone wages, and personal debt are taken into consideration. However, another important source of risk comes from the business structure chosen by people opening their own business. In the United States, some business structures offer a legal shield and allow people to form a separate business entity in order for entrepreneurs to separate business and personal assets. Some examples of these business structures are LLCs, S-Corporations, and C-Corporations, and they would technically lower the overall risk of a business failure.

Unexpectedly, based on data from the Internal Revenue Service (IRS), the vast majority of businesses do not have that legal protection that separates personal and business assets (IRS, 2021). Figure 4 shows how an estimated 72% of all businesses are sole proprietorships while only around 25% have some level of legal protection, which in this case are mostly corporations. This added layer of risk adds to the idea that perhaps the decision-making mechanism does not entirely rely on factors related to the business and individual's financial stability. In the following sections, ideas on how other personal components interact will be introduced with the objective of explaining this phenomenon.

Figure 4

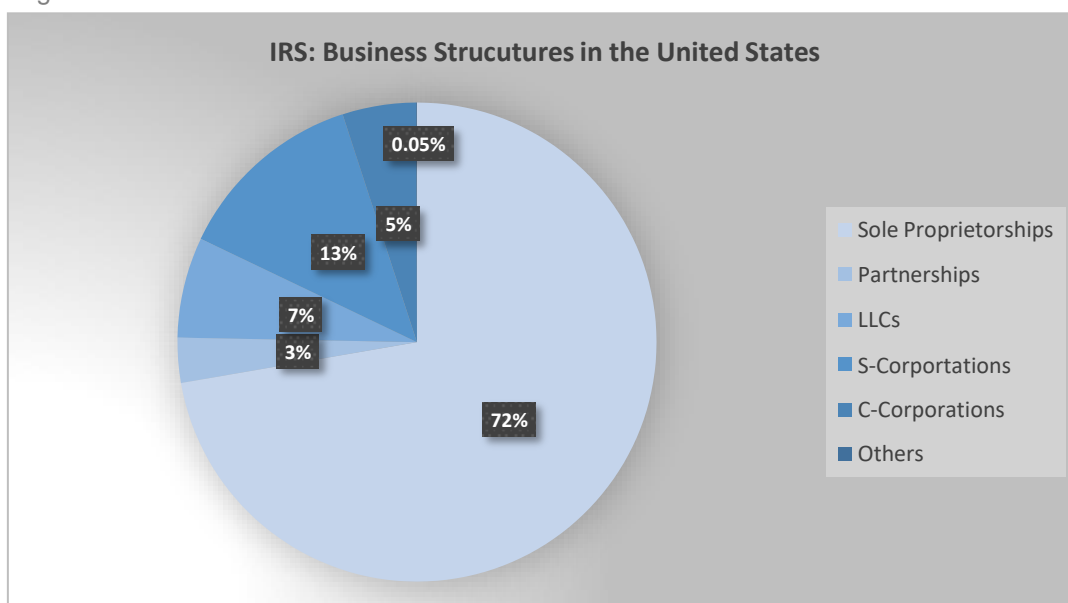


Figure 4: Share of different business structures in the United States (Source: IRS 2012)

Background (Economic Literature)

Expectancy Theory

The importance of the perception of future outcomes entrepreneurs have plays an essential role in the probability of specific future events. For example, having beliefs that one's actions will lead to successful outcomes guides people's decision-making process in a way that makes it more probable for them to end up taking action. This idea can be fully explained from the Expectancy Theory (Mattingly & Kushev, 2016).

The internal process described above can explain why perception of outcomes is relative, as it depends on the individual's initial beliefs and compounding factors. Some inputs to human perception, when applied to the topic of this paper, can be the perceived value and the opportunity cost; both of which help form expectations that can either push or deter the individual from making a particular decision. Moreover, as expected, under this framework, what may be a negative or non-desired outcome for some people may not necessarily be negative for others.

The ideas stemming from the Expectancy Theory serve as a way to explain differences in assessments amongst individuals, based on the premise that not everyone's perceptions and preconceived notions are the same. The final product of this is a framework that can be used to justify the introduction of subjectivity later on. In addition, this theory allows for the existence of overconfidence, as assessments are not entirely objective and are partially based on non-tangible factors.

Mental Accounting

Mental accounting had initially served as an alternative to the standard permanent income or lifecycle theory of consumption, which was built on the notion that people made decisions based on what they believed would optimize their lifetime spending. Unlike the lifecycle theory, mental accounting allows for what could be initially perceived as irrational or unexpected behavior by the introduction of mental accounts. These mental accounts have a foundation in the idea that individuals manage their financial decisions by grouping or categorizing expenditures in different classes. In other words,

under this framework, individuals do not integrate all decisions (Milkman & Beshears, 2009).

The need to simplify transactions in day-to-day life is compatible with the premises presented above. Cognitive limitations do exist, especially when significant financial transactions are assessed. It is reasonable to accept that more time to evaluate will be given to once-in-a-lifetime events. Still, the rigor of said evaluation will be limited by the individuals' cognitive ability and how they organize their mental accounts (Hubner & Lejeune, 2021).

When applied to the topic of this paper, the findings formulated in mental accounting explain why it might not be the case that people think of all the potential losses or rewards in their lifetime, even when we talk about important events such as opening a new business. The time horizon of consideration might vary, yet the cognitive limitations persist.

Choice Under Uncertainty and Expected Utility Maximization

One of the issues presented when trying to use an expected utility maximization model to explain why people decide to open their own business is the uncertainty surrounding the outcome probabilities. Under the Von Neumann-Morgenstern risk preference function, probabilities are objectively specified, and decisions are rational. However, this idea is not reasonable to use when trying to describe new establishment openings. The myriad of factors that play a role in determining whether a business is successful or not, in the long run, make it impossible to objectively come up with a set of probabilities that can be applied to the traditional expected utility maximization framework (Rabin, 2001).

Fortunately, an alternative initially introduced by Leonard Savage allows us to model choice under uncertainty. In his paper, "The Foundations of Statistics", Savage does not assume the existence of objective probabilities, and it instead derives them from preferences over acts. This foundation is compatible with the other theories introduced earlier. Making choices under uncertainty both makes the probabilities subjective and captures the differences in opinion or perception due to differences in information and personal experiences (Savage, 2012).

In essence, we can think of this dynamic as people making inferences from past data and the way they frame the questions. These two factors open the door to biases, thus introducing the possibility of overconfidence. Even though the decision-maker acts as if they are maximizing expected utility, the assessment of both the payoffs and probabilities could be potentially off in the end.

The resulting combination of the economic literature presented is a framework in which relative assessments based on either tangible or non-tangible factors are made, and where final outcomes significantly different from initial expectations are possible. This dynamic will serve as the theoretical foundation of the model used to explain the phenomenon introduced in this paper. The following section will expand on the model specifics.

Theoretical Approach

The model in this paper aims to explain why individuals decide to start a new business despite high failure rates across sectors and states, making emphasis on the manufacturing sector, which has high initial capital requirements, not as much flexibility in terms of operation, and a low survival rate.

To answer this question, an expected utility maximization model is constructed, where both financial and non-pecuniary factors are included.

Expected utility and the role of non-pecuniary factors

Assuming that each individual aims to maximize the total utility gotten from the new business' benefits, we must initially consider two different groups of factors that play a crucial role in determining expected utility levels:

- **Financial expectations:** These include all the benefits having to do with the expected revenue and expected profit from the business venture. Although not necessarily only involving take-home earnings, financial expectations refer to the profitability and financial stability of the business, which in turn benefits the owner. The future stream of profits plays an important role in how options are

assessed. Moreover, the probability attached to these financial expectations are subjective and purely based on the personal perceptions, meaning that they are expected to vary from individual to individual.

- Non-pecuniary factors: This category includes all the factors that can generate some level of satisfaction on the individual but cannot be quantified or directly converted to a dollar amount (Mattingly & Kushev, 2016). Some of the factors include:
 - Personal satisfaction and appreciation of the journey.
 - Enhanced societal perception.
 - Sense of purpose (working in something meaningful).
 - Freedom and flexibility that comes with being their own boss.
 - Improved skills derived from the new business tasks.
 - Shifts in mental state.

With this foundational piece of the model, people can be driven by a combination of both financial and non-financial expected rewards, and the weight put on each group is relative to each individual. This implies that the more weight someone puts on non-quantifiable rewards, the less they would care about the expected stream of profits, lowering the threshold necessary for them to consider the business viable.

The inclusion of non-financial factors opens the door for possible situations in which the individual has a strong preference for personally defined rewards, meaning that we would expect to see cases in which decisions are taken almost purely based on personal gain, even with potentially severe financial losses (Audretsch, Obschonka, Gosling, et al., 2016).

Expected Future Stream of Profit

The initial problem with the introduction of expected financial rewards in this model comes from the subjectivity in the expected returns. Calculating expected future revenue and profit amounts with objective probabilities for a new business that has yet to exist is not a simple task, and this is reflected in the model for this paper.

Exact profit streams are not considered when initially assessing the choices available. The blurry and uncertain financial outcomes will force the individual to come up with a range of possible financial gains and a subjective valuation of the probabilities of the most likely scenarios. In practice, the average of the range obtained will be assessed at a subjective probability and will be used to assess the expected utility obtained from that event. This is founded in the framework of mental accounting and choice under uncertainty, where individuals need to make a decision but do not have the cognitive ability, information or expertise to fully assess all the potential outcomes in an objective manner.

The inclusion of the range portrays the uncertainty of the business venture and how it affects the perceived monetary value. This blurriness serves as a partial explanation of apparent lack of risk-aversion behavior explained early in the paper (Mishra & Zachary, 2015).

The lack of a precise single amount in gains allows the possibility of overconfidence in the feasibility of the business project. People might overestimate the future financial gains and think the perceived value is higher than the opportunity cost when the reality might be different. Furthermore, the overconfidence can be present in the probabilities assigned to each outcome, as they are subjective.

Opportunity cost and financial losses

Unlike future financial gains, potential losses and the opportunity cost of starting a new business are not as opaque in nature. This model assumes that the individual's ability to assess potential losses and opportunity costs is more accurate and objective than when evaluating potential gains.

Financial losses represent the initial monetary capital needed to open a new business and expected losses from initial business operation. This includes loans, savings, or any kind of liability that the business owner would need to have in order to afford their business idea. Meanwhile, the opportunity cost would capture other essential factors such as foregone wages (in case of the abandonment of the current full-time or part-

time job), and other streams of income that would have to be forgotten about if the business were to open.

Once calculated, this amount would serve as an initial point of comparison for the individual before making the decision. In general terms, an individual who only cares about the financial aspect of the business venture will not decide to open a new business if the potential financial losses far outweigh the potential financial gains. In other words, if personal gains are ignored and the individual only focuses on the financial feasibility of the business, they would not decide to open a business if their assessment indicates the negative utility derived from losses is greater than the expected utility from expected financial gains (Mattingly & Kushev, 2016).

However, the importance of this calculated amount diminishes as the focus shifts from financial gain to personal gain, driven by the focus put on personal rewards rather than monetary rewards. The weight placed on financial and non-pecuniary factors will determine how the individual balances each aspect of the event and will determine the relative importance of these two sets of factors.

Status quo

The status quo element captures the current level of emotional satisfaction in the life of the individual. The purpose of this element in the model is to serve as a modulator to the perceived potential losses and the opportunity costs.

An individual with a positive level of satisfaction in their current lifestyle would be more hesitant to start a new business if the “status quo” is put in jeopardy. This would augment the risk-aversion tendencies presented by the individual for any level of potential losses (Audretsch, Obschonka, Gosling, et al., 2016).

Conversely, an individual who is unsatisfied or unhappy about their current lifestyle, would be more inclined to take on the risk of starting a new business, since not doing would represent negative repercussions to their emotional state. The way this translates to the model is a decreased sensitivity for any level of potential losses. The way this is implemented in the expected utility function will be in the form of a higher expected utility obtained from non-pecuniary factors if the person decides to start a new business.

When would someone start a business?

Once the individual in question calculates the initial values for potential losses and the range of potential financial rewards, the personal preferences and the weight put in them will determine the expected value obtained at each level of positive gain, while the status quo element would determine the expected negative value in case of the business failing. In other words, if they believe that the perceived satisfaction is greater than the perceived losses, both financial and non-financial, the individual would conclude that they should start the new business, thinking that they have a good chance of reaching the desired outcome.

The expected utility function will look like this:

$$U(\text{Starting a new business}) = [\alpha(P1 * Y1) + (\alpha - 1)(P2 * Y2)] + [\delta(P3 * Y3) + (\delta - 1)(P4 * Y4)]$$

Where:

U = Expected Utility.

α , δ = Weight terms.

P1, P2, P3, P4 = Probabilities assigned to the possible outcomes.

Y1 = Average of future streams of profit (Obtained from the range of considered possible financial outcomes in case the business is opened).

Y2 = Utility obtained from non-quantifiable factors considered to be gained by opening the business. (Described as non-pecuniary factors).

Y3 = Average of future streams of losses (Potential losses including initial investment, foregone wages and other quantifiable elements that could be potentially lost).

Y4 = Utility foregone from non-quantifiable factors considered to be lost by opening the business. (Described as disruptions to the status quo).

If U is greater than 0, the individual will decide to open a new business. If U is equal to 0, the individual will be indifferent between the two choices. Finally, if U is negative, the individual will decide not to open the new business.

Conclusions and Final Remarks

The model presented in this paper offers a dynamic framework that is able to introduce various subjective elements that help explain why entrepreneurs in the United States do not seem to be deterred by low survival rates, even in sectors that require high amounts of initial capital investment, and even in situations where the business structure chosen does not provide a liability shield. Moreover, the elements integrated into the expected utility maximization model allow us to include quantifiable and non-quantifiable factors to mimic real decision-making processes.

The phenomenon seen in the United States is therefore explained by an assessment of both financial and non-pecuniary factors whose weight is defined by the individual. This approach allows for the existence of overconfidence and takes into account behavior described by the expectancy theory, mental accounting, and choice under uncertainty theory.

The key highlight of the model is the importance of personal gains and losses, as they might play a bigger role in the final determination than the purely financial factors, depending on the weight terms. However, although the possibility of the non-tangible factors to play a significant role on the decision, the breakdown of what specific non-quantifiable factors are the most prominent cannot be determined with this model. In other words, there is still a lot of unknowns as to what people include in their assessments, separate from purely financial gains or losses. More work should be done to determine what aspects of life people take into account, and how it could vary depending on demographics, location, and sector.

References

- Audretsch, D. B., Obschonka, M., Gosling, S. D., & Potter, J. (2016). A new perspective on entrepreneurial regions: Linking cultural identity with Latent and Manifest Entrepreneurship. *Small Business Economics*, *48*(3), 681–697.
- Benabou, R., & Tirole, J. (2002). Self-confidence and personal motivation. *The Quarterly Journal of Economics*, *117*(3), 871–915.
- Benabou, R., & Tirole, J. (2011). Identity, morals, and taboos: Beliefs as assets. *The Quarterly Journal of Economics*, *126*(2), 805–855.
- Department of Labor (2021, October 27). *Business Employment Dynamics*. U.S. Bureau of Labor Statistics. Retrieved November 21, 2021, from <https://www.bls.gov/bdm/bdimage.htm>.
- Hubner, G., & Lejeune, T. (2021). Mental accounts with horizon and asymmetry preferences. *Economic Modelling*, *103*.
- IRS (2021). *SOI tax stats - integrated business data*. Internal Revenue Service. Retrieved November 21, 2021, from <https://www.irs.gov/statistics/soi-tax-stats-integrated-business-data>.
- Kreps, D. (2018). *Notes On The Theory Of Choice*. United States: Taylor & Francis.
- Lynch, K. (2016). Willful Ignorance and Self-deception. *Philosophical Studies*, *173*(2), 505–523.
- Mattingly, E. S., & Kushev, T. (2016). Most New Businesses Fail, but Mine Won't... Right? *The Journal of Entrepreneurship*, *25*(1), 70–88.
- Milkman, K. L., & Beshears, J. (2009). Mental accounting and small windfalls: Evidence from an online grocer. *Journal of Economic Behavior & Organization*, *71*(2), 384–394.
- Mishra, C. S., & Zachary, R. K. (2015). The Theory of Entrepreneurship. *Entrepreneurship Research Journal*, *5*(4), 251–268.
- Naumann, C. (2017). Entrepreneurial Mindset: A synthetic literature review. *Entrepreneurial Business and Economics Review*, *5*(3), 149–172.
- Rabin, M. (2001). Risk Aversion and Expected Utility: A Calibration Theorem. *Econometrica*.
- Savage, L. J. (2012). *The Foundations of Statistics*. United States: Dover Publications.
- Thunstrom, L., Nordstrom, J., Shogren, J. F., Ehmke, M., & Veld, K. van't. (2016). Strategic self-ignorance. *Journal of Risk and Uncertainty*, *52*(2), 117–136.

- United States Census Bureau. (2012). *Statistics for All U.S. Firms by Total Amount of Capital Used to Start or Acquire the Business by Industry, Gender, Ethnicity, Race, and Veteran Status for the U.S.: 2012*. Firms by Total Amount of Capital Used to Start or Acquire the Business . Retrieved November 21, 2021, from <https://data.census.gov/cedsci/table?q=total+capital+&tid=SBOCB2012.SB1200CSCB16>.
- Wieland, J. W. (2017). Responsibility for strategic ignorance. *Synthese*, *194*(11), 4477–4497.
- Xu, H., & Ruef, M. (2004). The myth of the risk-tolerant entrepreneur. *Strategic Organization*, *2*(4), 331–355.