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WHAT DRIVES FUNDING FOR RURAL ENTREPRENEURSHIP IN THE UNITED STATES? A LITERATURE REVIEW

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ABSTRACT

Funding startups, particularly rural entrepreneurial ventures in the United States, is not a simple binary process of checking off items on a list. There are many factors that impact whether a rural entrepreneur receives funding, from the type of rural venture, the location of the venture, to the skill sets of the entrepreneur, the social capital and networks an entrepreneur has, to existing business clusters, and to the policies of the government, private/public ventures, and private ventures.

This paper begins as a funding question; however, it ventures into the deep body of literature on the various considerations that affect funding. It is impossible to come to a formal conclusion on the exact reason, as there is no one specific answer. What this paper provides, however, is a much larger, but clearer, insight into the complexities that make up rural entrepreneurship and the potential reasons funding is a challenge.

Keywords*: Rural Entrepreneurship, Rural Venture Capital, Social Capital, Business Clusters*

INTRODUCTION

(M. L. Pato & Teixeira, 2016)) boldly state that,

> *Entrepreneurship has become a dynamic field of research in the last two decades. However, 'rural entrepreneurship' has been largely overlooked. Based on 181 articles on rural entrepreneurship published in journals indexed in Scopus, we found that rural entrepreneurship is an essentially European concern, whose most prolific authors are affiliated with institutions in the UK and Spain. (p. 3)*

This sentiment is echoed by much of the literature on rural entrepreneurship in the United States. (Fortunato, 2014; Goetz et al., 2010; Pato and Teixeira, 2016; Acs & Malecki, 2003). Interestingly, even the Global Entrepreneurship Monitor's (GEM), 2019 assessment of entrepreneurship in the United States fails to even mention the word 'rural' let alone study it (Bosma et al., 2020.)

If there is little research, and it isn't on the radar of GEM, is there really a problem? The answers vary and include references to the diminishing economic support of agriculture, mineral

extraction, lumber, and retail, as well as the need for economic development so as to stop the "brain drain". A "brain drain" (i.e., being the loss of college-educated people from the area) measurement can be seen in the following statistic: American counties in total lost 11% of their population between 1970 and 2000. Ninety-six percent of those counties experienced brain drain, with 95% being nonmetropolitan or rural (Macke & Markley, 2006). Additionally, much of the economic development community supports the concept of entrepreneurship for rural communities. It is suggested that creating entrepreneurial communities is the most practical policy option to stimulate organic growth in these rural communities (Stephens & Partridge, 2011).

But there is a recurring theme to these cries of support for rural entrepreneurship, and that is rural entrepreneurship is significantly different in a myriad of ways from that of traditional urban entrepreneurship (Macke & Markley, 2006; Jolley, Uzuegbunam & Glazer, 2018). It is important for community developers to recognize that urban policies and practices are not suited for the special social and economic conditions of rural areas (Fortunato, 2014). Funding is often to blame for the lack of successful venture creation. In rural areas, typically a firm's founder may not have sufficient means to finance the project alone. It is the substantial capital requirements that deter entrepreneurs—a one-two punch of high requirements of capital needed for production processes and the limited access to capital (Ho & Wong, 2007; Lerner, 2009).

With the availability of venture capital, governmental funding, and foundational support such as the Kellogg Foundation and the Ewing Marion Kauffman Foundation, why is financial support a problem? The hypothesis is that it is much more than an issue of lack of capital for rural entrepreneurs or an irrelevancy of startup ideas. There are a host of factors each having different levels of effect on each situation. The purpose of this paper is to identify the factors that affect funding, financial support, and/or equity financing of rural entrepreneurship. Included is a discussion of what constitutes rural entrepreneurship, what a rural entrepreneur looks like and how does one practice entrepreneurship; whether social capital impacts success; the effect of regional clusters, and how public policy affects the success of rural entrepreneurs.

LITERATURE REVIEW

To understand more clearly the issues behind funding rural entrepreneurship, it is helpful to have a clearer understanding of the concept. There are many definitions of rural, entrepreneurship, and rural entrepreneurship. The literature is somewhat consistent; however, there are differences in connotation as well as denotation. Macke and Markley describe a "third rural America", one that came after the urbanization of originally rural areas, and the development of "high amenity" rural areas. This "third rural America" is characterized often by extraction work, with industries such as agriculture, forestry, fishing, mining, energy production, and manufacturing. Often these communities are less prosperous, economically and socially challenged and in chronic decline (Macke & Markley, 2006). In addition to the connotations of a hard and rough life, rural is also defined by typologies. Pato and Teixeira describe two of them as spatial, based on demographic criteria such as settlement size, population density, or the population active in agriculture; and socioeconomic, performance typologies based on indicators such as institutional, social, and economic and environmental conditions and performance (Pato and Teixeira, 2016). Rural areas are defined by the absence of dense environments of customers and suppliers, knowledge spill-overs, urban agglomeration advantages such as an abundant labor

market, transportation, both public and shipping, capital investment (venture), and the ability for face-to-face contact (Acs & Malecki, 2003).

Entrepreneurship is also defined in many ways. From a simple perspective, Shane (2008), in a seminal piece called, *The Illusions of Entrepreneurship* uses a simple Merriam-Webster definition of "one who organizes, manages, and assumes the risks of a business or enterprise" (p. 2). There are several definitions of entrepreneurship including the National Commission on Entrepreneurship's definition of entrepreneurial growth companies—small businesses that have the potential to grow rapidly, developing new technologies, products, and services; creating jobs; and stimulating economic growth and investment (Dabson, Brian, 2001); or one who applies an entrepreneurial mindset, tools, skills, and techniques to transform an idea into an enterprise that creates value for profit and/or social good (Markley et al., 2015); or the other extreme of a subset of a variety of different disciplines, including economics, business management, sociology, and psychology. The fragmented nature of entrepreneurship research means that entrepreneurship is a necessarily broad term that captures a whole range of behaviors, attitudes, motivations, and activities (Fortunato, 2014)). Given not only the fragmentation of the research but also the various definitions, it becomes important to resist lumping rural entrepreneurs into the high growth and profit categories, because not all rural entrepreneurship fits.

What constitutes, then, *rural entrepreneurship*? Wortman's study of rural entrepreneurship described it as 'the creation of a new organization that introduces a new product, serves or creates a new market, or utilizes a new technology in a rural environment" (1990, p. 330). Pato and Teixeira provide a laundry list of various definitions, including the creation of firms in rural areas, the development of small firms, and finally, an entrepreneur living in a rural environment who is community-based and influenced by social networking and social traits of that rural locality. This excludes businesses that have a rural location but do not do business locally, and do not contribute to the rural economy (Pato & Teixeira, 2016). It is posited that a "rural enterprise" is measured by indicators such as new firm formation rates, and has been correlated with the economic prosperity and growth of rural areas (Pato & Teixeira, 2018). Given the dearth of mainstream literature, it is contended that there might not be such a "thing" as rural entrepreneurship. Rather than defining it, it is described as moving away from economic traits based in rational action for profit maximization, and personality traits and characteristics of a successful firm founder toward an approach that sees ventures as part of the locally dynamic defined networks that focus on the relationship of the entrepreneur and the local community (Fortunato, 2014).

It is here that a natural segue into factors affecting the financing of rural entrepreneurship can be made. Much of the following literature will describe the various impacts on rural entrepreneurship which, in the end, affects the ability to be sufficiently funded, if at all.

Funding

Prior to the creation of venture capital, the only sources an entrepreneur had were family, friends, and high-wealth individuals. Banks and stockbrokers rarely, if ever, took risks on firms

with little or no collateral (von Burg & Kenney, 2000). Venture capital, created in the post-war economy, was meant specifically for high-growth, disruptive, technologically sophisticated companies. Venture capitalists being very discerning, finance less than 3% of all new businesses founded in the US every year (Shane, 2008).

Already "behind the 8-ball", rural entrepreneurs struggle for funding sources. And while the failure rate of new business is no different from that of urban or "suburban" startups, (Renski, 2008), rural entrepreneurship still finds itself looking at bootstrapping or personal funding as a method of funding. Lenzi describes a lack of "vital" resources including capital. Some of the types of firms that can't get adequate financing include those outside the local geographic service area of the bank; firms considered high-risk firms because of limited access to equity capital and the lender's unwillingness to use participation and guarantees to spread risk; pre-venture or start-up firms needing debt capital; and fast-growing firms seeking expansion loans (Lenzi, 2016). In a survey of forty Midwest Venture Capitalists, half of them had not invested in businesses in cities with populations under 50,000. Of 318 firms seeking at least $100,000 62% of the firms that were successful in obtaining funding were urban compared to only 37% being rural (Lenzi, 2016). While there is a local bias toward existing residents to be able to obtain local funding (Goetz et al., 2010), it is based significantly on manufacturing and not on entrepreneurial ventures. Of the $300 million awarded to community development since 1994, only 11 percent has gone to rural America (Dabson, Brian, 2001). Resources exist, as documented by the literature. Why does it not filter down to rural entrepreneurship?

Funding Entrepreneurs

There are two positions to funding entrepreneurs. The first is the position of Shane who claims that people start marginal businesses that are likely to fail and have little economic impact, generating little employment (Shane, 2008). Think of a coffee shop. The belief is that investing an hour or a dollar is a worse use of resources than investing the same in the expansion of an existing business. His overall position is that traditional entrepreneurship, and in particular, that of non-technology, is a fallacy and that the encouragement of these types of startups is a grave error. Adding more fuel to this fire is the empirically demonstrated fact that serial entrepreneurs, those that have created companies before, have access to venture capital funding more easily than nascent entrepreneurs. Venture capitalists recognize that when they invest in a business, they are investing in a person. The individual leading the venture is considered to be more important than the enterprise's products, which ultimately must be adapted over time to changing market conditions. This is primarily due to the experienced entrepreneur having a relationship with the VC players (Lichtenstein & Lyons, 2001; Zhang, 2011).

Juxtaposed to this is the literature that says proper resources, including capital, is the necessary support rural entrepreneurship needs. Sarasvathy (2001), in her seminal work about effectuation versus causation in entrepreneurial ventures, says that the creation of a market is more beneficial than the observation of an opportunity to capture. She states:

> *The essential agent of entrepreneurship, as I argue here, however, is an effectuator: an imaginative actor who seizes contingent opportunities and exploits any and all means at hand to fulfill a plurality of current and future aspirations, many of which are shaped and created through the very process of economic decision making and are not given a priori. (p.262)*

One of the four conjectures she makes is that "effectuators" fail, but can manage the failure and make good out of it, more quickly and more efficiently (Sarasvathy, 2001). For clarification, the definition of effectuation and causation is provided by Sarasvathy (2001):

> *Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means. (p.245)*

Anecdotally, a colleague describes it as, "Causation is when you see the need in the market and then create the product; versus, effectuation which is where you create the product and apply it, thereby creating the market." The point in this juxtaposition is that Shane believes that all small business is wasted investment, whereas Sarasvathy believes small business can be trained to effectuate and grow. The effect of networks (social capital) on effectuation is discussed later in the paper.

A slightly different perspective is the position of the community with respect to development. Extractive communities suffer from a "them versus us" mentality causing residents to feel helpless to change their economic situation or consider alternative community development due to experiencing generations of boom and bust cycles and the exploitive and arbitrary hiring and firing of labor. Capitalist activities, like entrepreneurship and investment, are identified with the elite class and rarely attempted by the working class (Fortunato, 2014).

Tangential to rural entrepreneurship and the types of businesses funded, an interesting GEM study showed that three sectors account for 65% of all startup activity for women: wholesale/retail, health and education—business to consumer; whereas men are more focused on business-to-business and capital-intensive sectors, such as manufacturing and transportation, agriculture and mining, and information and communications technology (GEM, 2020).

In a study on entrepreneurial social identity by Alsos, Clausen, Hytti, and Solvoll (2016), the findings revealed that entrepreneurs are a heterogeneous group and a combination of effectual and causal behavior is observed, with the implications being "Communitarians" (people concerned about the community) who were not 100 percent motivated by profit. Those that were motivated by profit, "Darwinians", were more causal and thereby more "traditional" in their behaviors (Alsos et al., 2016). Morris, Neumeyer, and Kuratko (2016) contend that the lifestyle entrepreneur and the small business entrepreneur should not be ignored to support only the high-growth "gazelles" described by Shane. They believe all venture types should be encouraged as they play fundamentally different roles in the economy (Morris, 2016). Manimala's (2002) study of founder characteristics, observes that the policies and practices of the enterprise are determined by the nature of the project, the type of business environments, and the personality of the entrepreneur He concludes that cultural differences impact the personality profile more than

enterprise policies and strategies (Manimala, 2002). To that end, then, what impact does cultural and social capital have on the ability to attract funding?

Social Capital

In a search for the reasons for the lack of funding for rural entrepreneurship, a great deal of literature presented itself on the concept of social capital. De Carolis & Saparito (2006) described social capital in two ways—bonding and bridging. Bonding explores the impact of a collective's internal ties and the substance of the network relationships. Bridging, also referred to as the private-goods model of social capital, focuses on individuals and their network relationships. Stam, Arzlanian, and Elfring in a meta-analysis of social capital and small firm performance, find there is a significant positive correlation between the two. What this means is that even though entrepreneurs must invest substantial resources to cultivate their networks, social capital does create value for these small firms (Stam et al., 2014).

Deakins and Bensemann's study on the location of a startup found that it is the founding entrepreneur's approach to looking for resources and information that will affect the business's success. They relate Social Network Theory to the Resource Based View and suggest that business networks in rural locations are likely to be thinly dispersed and limited in the extent of strong ties that build trust and weak ties that transfer information. The firms involved may lack centrality and networks are more likely to have structural holes. (Deakins & Bensemann, 2019). Tying social capital, in the form of networks, back to effectuation and the ability of a rural entrepreneur to practice it, Kerr and Coviello find that pre-existing networks can influence the cognitive and behavioral aspects of effectuation in myriad ways (Kerr & Coviello, 2020). At other times, network influencers can provide positive input and role modeling. Lyons states that social capital is the relationships between individuals and organizations based on expectations, obligations, and trust (Lyons, 2002), and is thought to be the 4th form of capital behind financial, human, and physical, but is not subordinated as such (Lyons, 2002).

Barriers to social capital can be great including, but not limited to, lack of availability, visibility, affordability, and skill of the entrepreneur. In addition, it is often difficult to build, let alone maintain, strong networks due to the location of the rural enterprise (Lyons, 2002). Firms that are created by locals are bigger both in terms of capital and employment, operate with more capital-intensive technologies, and are able to obtain greater financing per unit of capital invested than firms created by non-locals (Michelacci & Silva, 2007).

On a disconcerting note, Fortunato addresses the role of "deep bonding" social structures that could be an impediment due to a 'tight-knit, strong-tie kinship group' (Fortunato, 2014, p. 392). Additionally, analysis of bank relationships provided empirical support for the fact that social capital, in the form of bank relationships, decreased the probability of default. Comparing rural loans to urban loans found that a higher frequency of social interaction in rural areas reduces loan defaults because borrowers work harder to avoid default and lenders are better able to screen and monitor loans because the cost of information is low (DeYoung et al., 2019). An interesting aside, however, is that for one standard deviation increase in local social capital, the probability of an SBA loan default declines by only 5% (DeYoung, et al., 2019). They theorize that it's not simply social capital at work but rather the close-knit relationships and culture of the community.

Flora, (1998) asks if social networks are a community issue or something for an individual to use for their own self-interest (rational choice view). Discussing "embeddedness", the conclusion was that communities did not become civic because they were rich, rather historical records strongly suggest that they have become rich because they were civic. Social capital embodied in norms and networks of civic engagement seems to be a precondition for economic development. Korsgaard, Ferguson, and Gaddafors concluded that not only were social networks and social capital important, but more so was the ability of the startup to develop external networks for marketing, process education, and other specialized knowledge (Korsgaard et al., 2015). Ironically, however, they found that placial embeddedness is a central enabler of entrepreneurial activities, but then one has to consider the limitations that placial embeddedness imposes on rural entrepreneurship activities. With the exception of one business, none of the entrepreneurs in their study demonstrated any ambition for growth very much beyond their current activities (Korsgaard et al, 2015). Ironically, this study was based on the food industry which relies heavily on industry clusters and social networks.

Flora makes the case not only for social capital but for Entrepreneurial Social Infrastructure (ESI) as the precursor for the successful development of business. "ESI can be changed through explicit collective effort. It links social capital to *agency*. A community that has a well-developed social infrastructure tends to engage in collective action for community betterment" (Flora, 1998, p. 489). ESI is based on agency, diversity, and horizontal participation, not hierarchy (Flora, 1998).

Clusters

Clusters, an agglomeration of closely related industries, provide significant social capital and intellectual capital to an entrepreneur. According to Delgado, Porter, and Stern (2010), startup employment and startup establishments are growing due to Regional Clusters. They posit that a cluster of related industries in one location will foster entrepreneurship by lowering the cost of starting a business, enhancing opportunities for innovations, and enabling better access to a more diverse range of inputs and complementary products (Delgado et al., 2010). While their study focuses on entrepreneurs and startups, as well as existing firms, and empirically proves that clusters improve performance, it fails to address rural considerations. Munnich and Schrock, in *The American Midwest* (2003) address rural knowledge and industry clusters. They theorize that industry clusters can be used as a model for regional development and also provide support to rural entrepreneurs (Munnich & Schrock, 2003). Explaining the contradiction of "rural industry clusters", they provide anecdotal and empirical examples of successful clusters such as the RV industry in Indiana, the carpet industry in Georgia, furniture in Tupelo, Mississippi, fishing gear in Woodland, Washington, and sporting goods in Hood River, Oregon (Munnich & Schrock, 2003). They use the term micro-clusters or extensions of metropolitan clusters. The risk, however, is if the industry declines so does a significant base of employment with it. Do clusters, or lack thereof, affect the funding ability of a rural entrepreneur? Should local and regional policymakers focus on that?

Policy

Shane opens Chapter 10 with the words, "How Valuable is the Average Start-Up?" (Shane, 2008, p. 146). That is the question all policymakers must consider. Is a rural start-up valuable? Shane cites the Global Entrepreneurship Monitor and takes issue with a statistic. He asserts that one cannot infer that having more start-up activity makes GDP grow faster in some countries than in others. He then asks if this evidence really means that new firm formation *causes* economic growth?" (Shane, 2008). Shane would say no. Yet, for every statistic that Shane takes issue with, there is literature espousing the opposing side, in support of non-high-tech entrepreneurship. Shane insists that policy should focus on supporting high growth, high dollar, high tech enterprises, and reduce incentives for the marginal entrepreneur to start businesses by reducing the transfer payments, loans, subsidies, regulatory exemptions, and tax benefits that encourage people to start businesses (Shane, 2008). Yet according to the 2020 GEM study:

> *Entrepreneurs and entrepreneurship are often portrayed as being contingent on innovation. While this may be the case for founders and firms portrayed in the media, such entrepreneurs and their firms are outliers. The vast majority of new ventures across the globe do not depend on new products or services. These numbers bear out for the United States as well, where 70% of respondents do not have a new product or service as their foundational offering. (p.34)*

Additionally, with regard to rural entrepreneurship, Fortunato asserts, "There is a growing recognition that urban policy and practice approaches may not be well suited to the special social and economic conditions of many rural areas" (Fortunato, 2014, p.387).

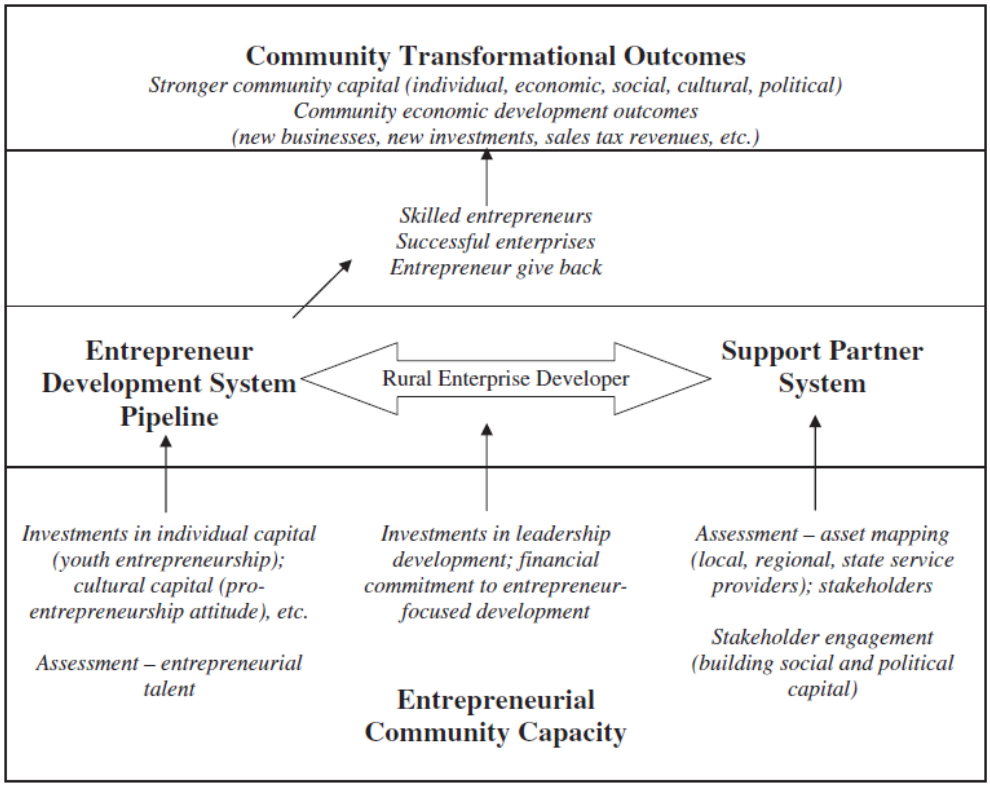
Looking from another perspective, Dabson (2001) counters with entrepreneurship being one of the main hopes for reviving and strengthening America's rural economies, despite it attracting little attention from rural policymakers. Stephens and Partridge take some middle ground with the concept that self-employment, while not the ideal standard for new business startups, still contributes to economic growth. They present evidence that the self-employed contribute to net economic growth. Even in remote rural regions, self-employment and the associated entrepreneurial capacity are positively linked to growth. However, they make note that there is no statistical linkage between the number of small businesses and growth, which implies that it's the type of business that is more important than the size (Stephens & Partridge, 2011). They also note that while the area being discussed (the Appalachian region) lags behind in proprietor formations, it also has fewer "firm deaths" and higher rates of startup survival (Stephens & Partridge, 2011).

Jolley, et al., discuss the concept of public venture capital for startups in Ohio. They estimate that venture capital firms owned or supported by governments participated in over $4 billion per year of investments in privately held firms, globally (Jolley, et al., 2017). They contend that public VCs can energize the private markets, fill gaps in the areas where private VCs would be reticent, provide seed money to get the investor to the next stage for second-round VC involvement, and bridge the information asymmetries that are found between private VC and

entrepreneurs. It is a complimentary function according to the proponents (Jolley, et al., 2017). The success of their program, Tech Growth Ohio, can be demonstrated by "the creation of over 575 direct jobs in the region with an average salary of $53,750 in a region where median household income is $33,823. TGO has achieved a leverage ratio of $17.8 for every $1 of State spending" (Jolley et al., 2017, p. 16). As an aside, Tech Growth Ohio supports the Southeast portion of Ohio, typically known for its rural poor. In a report from The Federal Reserve of Minneapolis (Foster, 2001) it is suggested that capital opportunities are expanded along each "rung" of a firm's capital "ladder". A company on the first rung when it is starting out needs seed capital; on the second rung businesses need assistance with operating expenses; and on the third rung, the company needs venture capital, which would be millions of dollars of investment.

Goetz, et al, believe that the positive message in the existing literature is that, using the measures of entrepreneurship available, government policy can influence economic startup activities (Goetz et al., 2010). Macke and Markley, in their *Illinois Institute for Rural Affairs Rural Research Report* (2006), make it clear that a systems approach is necessary for the successful creation of entrepreneurs. They state that development spending needs to be balanced to direct more investment into entrepreneurship strategies with proven track records. Markley, et al., contend that to have successful economic development, communities have to invest in human and financial capital and have the ability to "stay the course" long enough to build capacity and then achieve results. (Markley et al., 2015). This is one component of what they call "ecosystem development". They contend that it's not a matter of simply legislating funding, but rather creating an ecosystem—a holistic approach—for the entrepreneur to help them be successful. Enterprise development efforts must shift from the providing of services to the development of the entrepreneur (Markley, et al, 2015). See Figure 1 below.

Figure 1 Place Based Entrepreneurial Development EcoSystem (Markley, et. al, 2015)



Goetz, et al, bring up many interesting points in evaluating US rural policy. While not the primary argument, but one of interest, is that there is a definite correlation between high health insurance costs and the lack of startups in a state. Foremost, Goetz, et al., (2010) emphasize the importance of public policy objectives. They exhort whether the efforts are aimed at increasing small business formation, numbers of proprietors, profits, and regional output or whether entrepreneurship is a means to an end specifically, policy enhances entrepreneurship in order to improve overall local and regional economic conditions such as greater population and job growth. Yu and Artz clearly note that entrepreneurship is place-based (in their own community), involves using available resources, and can "create, renew, and reinvent purposeful identity for place" (Yu & Artz, 2019, p. 665). Their concern is that it becomes, then, a regional issue as it is almost impossible to grow with existing social capital.

And finally, the issue of job creation, whether in a rural or urban context is always the tip of every public policymaker's tongue. A paper from E^2 Entrepreneurial Ecosystems brings up the great jobs creation debate. Determining who is creating jobs – small businesses, large ventures, growth entrepreneurs – is an important question. A community's development strategy should be built with an understanding of the jobs creators as one of the key metrics (Macke, 2020).

Kang, Edelman, and Ku provide empirical research demonstrating that VC does not always contribute to jobs. Governmental funding, in the case of this study, the NIH, creates

more jobs directly than that of a VC. While the context is intellectual capital—much coming from research institutions—the evidence points to governmental funding having more positive effects. The positive effects are more conspicuous when there is a plethora of intellectual capital in the region. Venture capital tends to interact with intellectual capital in the short term, NIH funding does so in the long term (Kang et al., 2019).

CONCLUSION

Funding startups, particularly rural entrepreneurial ventures, is not a simple binary process of checking off items on a list. There are many factors that impact whether a rural entrepreneur receives funding, from the type of rural venture, the location of the venture, the skill sets of the entrepreneur, the social capital and networks an entrepreneur has, to existing business clusters, and to the policies of the government, private/public ventures, and private ventures. This paper began as a funding question but subsequently ventured into the deep body of literature on the various considerations that affect funding. It would be impossible to come to a formal conclusion on the why, as there is no one specific reason. What this provides, however, is a much deeper look into the complexities that make up rural entrepreneurship and the potential reasons funding is a challenge.

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SMALL BUSINESS & ECONOMIC CONDITIONS: NAVIGATING VOLATILITY

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ABSTRACT

COVID-19 created a health crisis and contributed to economic factors that are impacting consumers and small businesses, with both sharing interdependencies. This paper explores those impacts by investigating current and projected conditions associated with inflation, supply chain logistics and disruptions, labor shortages, debt accumulation and borrowing habits, and confidence indices on the future of the U.S. economy, in juxtaposition with mixed results on businesses' pivots and innovative responses. Some economists have noted that as of mid-summer 2022, the U.S. economy had experienced a technical recession due to a "rule-of-thumb" definition of two consecutive quarters of declining GDP (Gross Domestic Product). This research is framed to address the volatility and uncertainty that small businesses are facing in the post-COVID-19 economy. It contributes to the literature of entrepreneurship by capturing the conditions and contexts informing the vacillations small businesses continue to endure. By curating observations of disparate data sources, patterns have emerged which may point to solutions for navigating the future. Many data points are confounding. On the one hand, GDP is up, and unemployment is down. On the other hand, ironically, the tech sector has been engaging in layoffs with several entities doing so for the first time in their respective histories (many are attributed to over-hiring during the pandemic); consumer debt is reaching an all-time high, while consumer sentiment has remained low and flat for approximately a year. As a result, uncertainties about assessing economic conditions and a trajectory, remain. For example, the National Bureau of Economic Research (NBER)[1] – comprised of a body of economists that are regarded by many as arbiters in making such determinations – has not, decided. As far as the management and mitigation of negative economic conditions go, it does appear that there is continued volatility ahead for consumers, small businesses, and the U.S. economy at large.

Keywords: *COVID-19, inflation, recession, small business, entrepreneurship, economy*

[1] Business cycle dating procedure: Frequently asked questions. (2022, August 15). Retrieved from https://www.nber.org/research/business-cycle-dating/business-cycle-dating-procedure-frequently-asked-questions

INTRODUCTION[2]

The U.S. and global economy suffered greatly due COVID-19 (Adams-Prassl et al., 2020; Amuda, 2020; McIntyre-Mills, 2020), with some small business sectors and occupations faring worse than others. Among those business sectors that were impacted the most, were those that involved close personal contact such as bars and restaurants, hotels (Gunay & Kurtulmuş, 2021), transportation (Rimmer, 2020), tourism at large, and personal services such as nail and hair salons (Fairlie, 2020; Obrenovic et al., 2020). Widespread "lockdowns" (Gopinath, 2020; Greene & Rosiello, 2020) and shutdowns of large and small businesses, parks, libraries, places of worship, government offices, and numerous other entities, impacted society at large (Barone, 2021; Greene & Rosiello, 2020). Some business closures that were intended to be temporary in nature, became permanent. As such, COVID-19 brought with it "both a health crisis and an economic crisis" (Stephens et al., 2020, p. 427). Thus, given additional coronavirus strains that have arisen (Bollinger & Ray, 2021), and the acknowledgement of "long COVID" by the medical community, the full impact over time (*Science & tech spotlight: Long COVID*, 2022) of this pandemic remains uncertain.

Next, inflation struck, affecting individuals as consumers (Rubin & Harrison, 2022) and small business owners (*Small business and inflation*, 2022; *Survey: Small business challenges worsen amid record inflation and workforce shortages*, 2022) alike (a majority of small businesses have no employees). Once gasoline, and importantly diesel fuel—vital for the production and/or transportation of almost all goods in one way or another—reached record highs (*Gasoline and diesel fuel update*, 2022; *What are the possible causes and consequences of higher oil prices on the overall economy?*, 2007), price increases began to deal mighty blows to personal and small business finances. Subsequently, consumers are confronting myriad price increases thereby straining finances considerably (Daniel, 2022). It is important to note that gas prices have leveled off to $3.42 in late-March 2023 (*Gasoline and diesel fuel update*, 2023), but are still a long way off from the pre-pandemic price per gallon of $2.53 in January 2020. Further, during the period associated with this research, gas prices did reach an all-time high nationally.

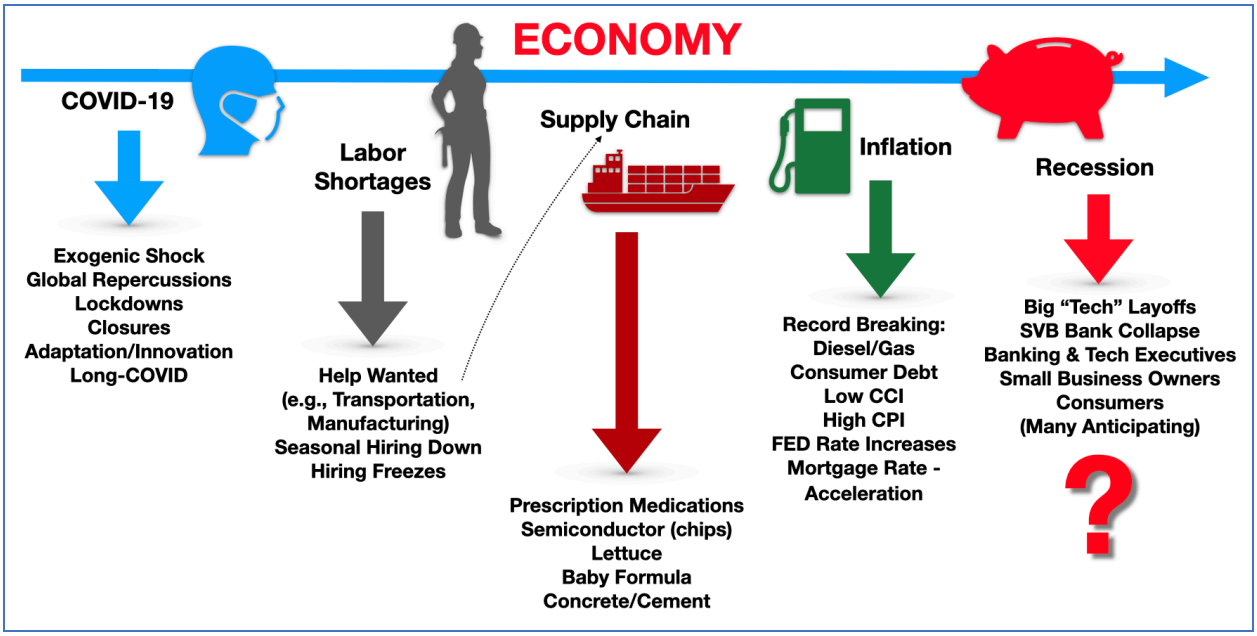
While inflation is a complex phenomenon in our economy, two key contributing factors to inflation in its present iteration were exacerbated by COVID-19 and are identifiable in the supply-side (through the supply chain) and demand-side (through consumer demand) (Santacreu & LaBelle, 2022). Small businesses are still suffering from inflation as well, and they do not anticipate relief any time soon (*Small business and inflation*, 2022; *Small business owners expect a recession, but few are ready for one*, 2022; *Survey: Small business challenges worsen amid record inflation and workforce shortages*, 2022). For the past several months, surveys (as well as the Federal Reserve and several banking industry executives), have been predicting the

[2] This paper, while it is a unique work product, is connected to an ongoing research stream (including literature review databases) pertaining to the small business and gig economy.

likelihood of a recession looming, or not. As such, this present research is necessarily conceptual in nature.

The paper is organized in the following manner. Context to our literature search strategy and approach is reviewed, noting the building of an extensive local database including extant literature and secondary data sources. Next a review of COVID-19 and the turbulence (Reed, 2022) and opportunities it created within the business environment is presented. An extension into the impact of what we are referring to as a "long-COVID economy" (Bach, 2022) is discussed (including labor shortages, lingering supply chain disruptions, and drops in consumer and small business confidence). These factors' contributions to inflation are discussed and further analysis into the unprecedented increases in short- (e.g., "basket of goods" as measured by CPI), mid- (e.g., car loans), and long-term funding (e.g., home loans) sources are explored in juxtaposition to U.S. consumers' rising debt to record levels (*Quarterly report on household debt and credit: Q 4*, 2023). Finally, amidst difficult economic conditions, growth in the number of businesses in the U.S. has reached record applications. Many businesses also pivoted and redirected their capacity toward new and novel outputs through innovation (Adam & Alarifi, 2021; Gurchiek, 2020; Von Krogh et al., 2020). This is reviewed in context of entrepreneurial growth, potentially spurred by the disruption from COVID-19, and the further strengthening of the gig economy. What happens next will be influential to the conditions impacting U.S. small business. So as to aid readers in better understanding the range of subtopics which are considered relevant to this research and their organization, a conceptual framework is offered below in Figure 1:

FIGURE 1
From COVID-19 to a Recession?



LITERATURE SEARCH STRATEGY

It should be noted that this research is part of an ongoing effort and is comprised of several databases (holding artifacts collected across time). Library database collections including those from, *Ebsco ABI/INFORM and ProQuest* have been accessed. Setting limits as follows, filters were applied to these library database searches: full text available and scholarly sources. An additional filter was also applied to restrict results to business disciplines. The reasons for narrowing results to business disciplines were two-fold. First, searches for scholarship associated with COVID-19 produce millions of results across disciplines (in an unfiltered library database search, the term "COVID-19" produced 10,677,916 results). For instance, databases focusing on medical/health care disciplines are densely populated. Secondly, this present research seeks to make a targeted contribution to the literature of small business and entrepreneurship. Prior searches have incorporated terms such as: 1) small business and entrepreneurship; 2) the "gig" economy (including freelancing and similar terms); 3) new product development; and 4) innovation. Most recently, the aforementioned searches were applied in conjunction with additional terms: COVID-19, pandemic, inflation, and recession. Accordingly, 541 artifacts were entered into a primary (local) database for this present paper.

Beyond library databases indicated above, artifacts have been curated from additional sources. These include publications from research organizations (e.g., NFIB Research Foundation); consulting firms with research arms or sponsoring research (e.g., Goldman Sachs); and data from government agencies. As scholarly researchers, avoiding popular press sources would be preferable. However, in some instances these have been useful at the very least, as a starting place, especially where up-to-the-minute news is concerned. Additionally, secondary qualitative data can take the form of government reports, press sources, and television and radio output, relevant social media content, among other sources. Secondary qualitative data methods have been identified as a promising resource for understanding dynamic circumstances (Rabinovich & Cheon, 2011). This repository of extant literature frames the current environmental conditions of small business in the U.S. due directly to the lasting impacts of the COVID-19 pandemic, the sustained growth of inflation, and the efforts to mitigate a recession. Discussion of the impact of these exogenous contributors on the U.S. consumer will also be included.

THE CORONAVIRUS GLOBAL PANDEMIC

COVID-19 "caused massive dislocation among small businesses just several weeks after its onset" (Bartik et al., 2020, p. 17656). The pandemic "generated disconnected supply chains, logistics challenges, shortage or unavailability of key resources, extreme price distortions, government restrictions on the functioning of many industries and markets, the need to redesign the working processes for many industries, consumer pessimism, and erosion of trust in global trade" (Morgan et al., 2020). While some small businesses were able to pivot (Knowles et al., 2020; Manolova et al., 2020) in response to what was clearly an exogenous shock to the global

economy (Cowling et al., 2020; Morgan et al., 2020; Roper & Turner, 2020), others were not, resulting in closures and failures (Barone, 2021; Fairlie, 2020; Greene & Rosiello, 2020).

As observed by Fairlie (2022) in work published by the Ewing Marion Kauffman Foundation, such upheaval also resulted in new startups: "The large-scale damage to the economy that began near the end of March 2020 showed up in more movement into and out of self-employment and new business activity during 2020 than in previous years" (p. 6). However, Fairlie also distinguished two different scenarios regarding these startups. Some were based on perceived opportunities, whereas others were due to necessity (such as unemployment). Considered one of the fundamental theories capturing the motivation for pursuing entrepreneurial endeavors, the post-COVID-19 economy inform conditions that contribute to the push-pull theory of entrepreneurship (Gilad & Levine, 1986). This theory classifies the entrepreneurial motivation to pursue ventures based on a push condition (out of necessity) or pursue ventures based on a pull condition (through observed opportunity) (Alam et al., 2021).

A 'LONG COVID' ECONOMY, BUT HOW LONG?

At this present point in time, the pandemic cannot be dismissed as completely abated, although many aspects of life (and business) have returned to a "next normal" (McLaughlin, 2022). Besides variants, a report from the Brookings Institute analysis of primary data from the US Census Bureau, stated that a phenomenon called "long COVID" affected 16 million working-age Americans (according to estimates) with returning, ongoing or new health problems. The estimate of the impact of long COVID has been as high as 4 million persons who are still being impacted by this virus and unable to work due to the associate symptoms (Bach, 2022).

It should also be noted that while many individuals are experiencing long COVID, based on the economic conditions whereby U.S. small businesses trade goods and services it appears that we are experiencing an economic version of long COVID. Meaning, there are still lingering impacts of the pandemic affecting current economic conditions, e.g., labor shortages (Ferguson, 2022), subsequent supply chain lags and breakdowns (Santacreu & LaBelle, 2022), increased costs attributed to inflation (Rubin & Harrison, 2022; *Survey: Small business challenges worsen amid record inflation and workforce shortages*, 2022), and increasing interest rates associated with loans for homes, cars, and small businesses (Holgate, 2022; *Minutes of the Federal Open Market Committee [FOMC] September 20–21, 2022*, 2022; Stauffer & Reed, 2022). It seems that the enduring economic impacts of COVID-19 (long COVID) continue to make long-term funding (home loans), medium-term funding (car loans), and short-term real time costs (CPI) more difficult to access and use. For example, directly long COVID is impacting the availability of workers as nearly 4 million workers in the U.S. are battling health effects and are still sidelined (Bach, 2022).

While in 2021 businesses reported an unprecedented total number of 3.8 million new jobs created, the workforce remains nearly equally and oppositely down at roughly 3.3 million workers available (Ferguson, 2022). Thus, year-to-date, there are around 3.8 million more jobs than the year before, but roughly 3.3 million fewer workers in the market to do the work. Contributing to this discrepancy between "more jobs" and "fewer workers" is the 2.4 million

excess retirements (representing more than half of those who left the labor force from 2020-2021) induced directly to COVID-19 through 2021-2022 (Faria-e-Castro, 2021). Compound this with the impacts of long COVID on the nearly 4 million workers within our economy and the labor supply challenge begins to make even more sense. Observed evidence of this can be found on almost any Main Street across the U.S., whereby it is a common occurrence to see signs on businesses stating, "Labor Shortage, we are closed," or "Be prepared for longer waits due to labor and staff shortage," and "Labor Shortage, we are hiring."

From vacancies associated with labor shortages observed in the restaurant industry to the percentage of vacancies across manufacturing jobs still being much higher than pre-pandemic rates, there are not enough workers to fill the positions (*Job openings levels and rates by industry and region, seasonally adjusted*, 2022). In turn, there is not enough 'people power' to manufacture the products and serve the existing demand. Cripple (or couple) this with tapering supply that is becoming increasingly costly to produce — and deliver, due to additional labor shortages in the transportation sector — and it is evident that there are still symptoms associated with the impacts of the global pandemic (Nummela et al., 2020; Salisu & Akanni, 2020) that are affecting both consumers and small business. In context of supply chain logistics and management, long COVID is still present.

INNOVATION AND PIVOTING

Reed (2022), from a survey of 656 firms nationwide, found that almost a quarter (23%) of businesses actually benefited in their financial performance from COVID-19, observing that opportunities can still be "identified and exploited even when environmental turbulence appears high or short-lived" (p. 604). Similarly, other researchers have documented the many instances of pivoting among both large and small businesses as well as other organizations, such as government offices, places of religious worship, and on the part of non-profit organizations (Lahm Jr., 2021). While the pandemic in some instances caused organizations and society at large to adopt and implement changes that were uncomfortable, other adaptations have produced lasting effects. As examples, while telemedicine was foreseen as a long-term trend, COVID-19 rapidly accelerated its adoption, and online shopping with curbside pickup options expanded substantially (Smith, 2020). The march of change continues on many fronts. "Technology and digitalization come as new entrepreneurship opportunities and bring new solutions and possibilities for innovation (3D print, IoT, Artificial Intelligence; Blockchain, etc.)" (Carvalho & Madeira, 2021, p. 2). Ferasso et al. (2018) observed that while certain industries have increased potential for new business opportunities (nanotechnology, biotechnology, and aerospace were indicated, but there are many more, such as A.I. and robotics as applied to myriad uses from services to manufacturing), knowledge and resources from around the globe may also be required.

Along these lines, Golder et al. (2009) discussed the relevance of core technologies. Examples would include vacuum tubes in early radios, televisions and computers, which were then superseded by new ones: first transistors, and next, microprocessors. Bezhovski et al. (2021) noted that while traditional means of developing business ideas (e.g., brainstorming,

design thinking) are well represented in published scholarly literature, new opportunities have arisen due to information and communication technologies (ICT). Examples they regarded as the most prominent included "entrepreneurial communities, online marketplaces, social networks (as bases of customers), random idea generators, surveying tools and services, tools based on search engine data, competition analyzing tools, idea crowdsourcing, idea mining techniques, idea management systems, etc." (Bezhovski et al., 2021, p. 325).

Corporations (at least those with the wherewithal to collect and leverage big data) have also been increasingly focusing on business intelligence (Demir, 2018, p. 13), with many using systems incorporating A.I. (Marion et al., 2020; Thiel & Masters, 2014). Also, several e-commerce (e.g., store) platforms are available for business start-ups (Raj & Athaide, 2022), such as Etsy, Shopify, Google Play Store, eBay and Amazon; these have made it easier than ever to establish a business presence and engage in transactions through their respective payment processing systems. "As advanced economies transition through various phases of economic value creation, e.g., from products to processes, from tangible goods to intangible experiences, they can leverage technological innovations to improve efficiency and enhance effectiveness" (Raj & Athaide, 2022, p. 487).

NEXT INFLATION

Analysis in a series of *Wall Street Journal* articles first published in April 2022 and updated every few weeks since then noted that "U.S. inflation accelerated to an 8.6% annual rate in May, its fastest pace in 41 years" (Rubin & Harrison, 2022). This figure was based on the most recent Consumer Price Index (CPI) at the time, before seasonal adjustment, from the U.S. Bureau of Labor Statistics (BLS). According the CPI (then, in May), "the [inflation] increase was broad-based, with the indexes for shelter, gasoline, and food being the largest contributors" (*Consumer Price Index - May 2022*, 2022). June was even worse as, "the all items index increased 9.1% for the 12 months ending June, the largest 12-month increase since the period ending November 1981" (*Consumer Price Index - June 2022*, 2022). Although percentages have been coming down from their highs in 2022, the CPI has continued to remain higher than the Federal Reserve's (2 percent) target. Additional data are presented in Table 1, below:

TABLE 1[3]
U.S. Bureau of Labor Statistics CPI - All Items Index (March 2022 – February 2023)

Month of Report	Percent Increase	Largest Contributors
March – 2022	8.5%	gasoline, shelter, and food
April – 2022	8.3%	shelter, food, airline fares, and new vehicles
May – 2022	8.6%	broad-based, with the indexes for shelter, gasoline, and food being the largest contributors
June – 2022	9.1%	broad-based, with the indexes for gasoline, shelter, and food being the largest contributors
July – 2022	8.5%	all items index unchanged over the month
August – 2022	8.3%	shelter, food, and medical care indexes were the largest of many contributors
September – 2022	8.2%	shelter, food, and medical care indexes were the largest of many contributors
October – 2022	7.7%	shelter contributed over half of the monthly all items increase, with the indexes for gasoline and food also increasing
November – 2022	7.1%	shelter was by far the largest contributor
December – 2022	6.5%	gasoline was by far the largest contributor
January – 2023	6.4%	shelter was by far the largest contributor to the monthly all items increase, accounting for nearly half of the monthly all items increase, with the indexes for food, gasoline, and natural gas also contributing
February – 2023	6.0%	shelter was the largest contributor to the monthly all items increase, accounting for over 70 percent of the increase, with the indexes for food, recreation, and household furnishings and operations also contributing

The CPI is based on urban consumers' out-of-pocket expenses (*Differences between the Consumer Price Index and the Personal Consumption Expenditures Price Index*, 2011; McCully et al., 2007). Additionally, the BLS CPI Calculator computes the value and purchasing power of an amount of money in alignment with a market basket of consumer goods and services through a year-to-year comparison. For example, if a consumer had $100 in August 2016 to purchase a market basket of goods and services, this individual would need $106 in August 2019 (6% increase in costs). To purchase that same market basket of goods and services from 2019 in

[3] Table developed using Consumer Price Index (CPI) data taken from monthly reports, before seasonal adjustment, from the U.S. Bureau of Labor Statistics (BLS). Retrieved from https://www.bls.gov/bls/news-release/cpi.htm#2022

2022, one would need $116 (16% increase in costs), approaching 3x's the previous comparable interval.

Table 2 presents the percentage increase in cost associated with an identical market basket of goods and services according to the CPI. Specifically, it demonstrates the purchasing power of $100 in the starting year and then demonstrates how much a consumer would need to pay to purchase the same market basket of goods and services 3-years later. Each time interval represents a 3-year period running from September to September annually starting in 2001 and running to 2022. The most recent 3-year interval from 2019-2022 represents the highest increase in costs (example of inflation) in the past 20 years by at least half in all but one other interval (with 2004-2007 at 9.72%). Additionally, this represents a pre-COVID-19 to post-COVID-19 snapshot and the impact that has accrued during this time. The data depicted demonstrates the increasing costs and decreasing purchasing power that a consumer has with their dollar and is a supportive indicator of inflation.

TABLE 2[4]
U.S. Bureau of Labor Statistics CPI since 2001 in 3-year intervals

September to September	Starting Value	Ending Value	Percentage Change
2019 – 2022	$100	$115.60	16%
2016 – 2019	$100	$106.35	6%
2013 – 2016	$100	$103.11	3%
2010 – 2013	$100	$107.19	7%
2007 – 2010	$100	$104.77	5%
2004 – 2007	$100	$109.79	10%
2001 – 2004	$100	$106.51	7%

As examples of observed consumer price increases (via authors' own experience using Amazon.com) illustrate, the price of a Motorcraft oil filter was $3.97 at the end of April; by mid-June it was $5.93, and as of October 2022 it increased to $9.99 before settling back to $5.93 once again. A store brand (Walmart, "*Great Value*") jar of mayonnaise went from $1.94 at the end of May; by mid-June it was $2.80; and by late-September it was $3.48 (months cited are all in 2022 and based on purchase histories maintained by merchants in online user accounts). Such increases are far more than the 8.2 percentage rate reported by the BLS Statistics (covering the period from September 2021 to September 2022) and even greater than the 15% increase identified with the CPI calculator. It is evident that much of the past 3-year's (pre- to post-COVID-19 economies) has occurred in the past few months. Additionally, these examples, do not address the widely used strategy known as shrinkflation, "reducing the amount of product provided while the price remains the same" (Yao et al., 2022).

[4] Table developed using Consumer Price Index (CPI) data, before seasonal adjustment, and a "CPI Inflation Calculator" from the U.S. Bureau of Labor Statistics (BLS); percentage change figures are rounded. Retrieved from https://www.bls.gov/data/inflation_calculator.htm

There are numerous explanations as to the root causes of inflation, but given that the cost of fuel impacts nearly all goods, and services such as airline passenger transportation (*What are the possible causes and consequences of higher oil prices on the overall economy?*, 2007), it is a major contributor. According to the U.S. Energy Information Administration's data, as of July 11, 2022, the average price for diesel in the U.S. was almost $5.57, and the average cost of gasoline was $4.65 (*Gasoline and diesel fuel update*, 2022). While the price of gasoline decreased over the summer from a high of over $5.00 in June, the current (as of writing) pricing ($3.42) is nowhere near pre-pandemic prices, e.g., $2.53 per gallon in February 2020 (*U.S. all grades all formulations retail gasoline prices (dollars per gallon)*, 2022). The price of gasoline in conjunction with the increasing CPI continues to increase monthly costs for consumers and businesses.

Additional issues are labor shortages coinciding with COVID-19 (Nelson, 2021) and continuing, which are associated with supply chain disruptions (Craighead et al., 2020; Ketchen & Craighead, 2020). Disruptions in the global supply chain continue to shine new light on interdependencies (Santacreu & LaBelle, 2022). Inflation does tend to hurt those with lower wages and fewer resources disproportionately, i.e., "the costs of inflation are borne most heavily by the poor" (Nallari & Griffith, 2011). As costs increase at a faster rate than wages can keep up, any surplus in the form of savings or investments is cannibalized by increased expenses associated with inflation.

The impacts of consumer price increases may be generally associated with small business in that they change buying behavior. Findings from an April NFIB (National Federation of Independent Businesses) Research Center report indicated that 62% of small employers identified "inflation is having a substantial impact on their business" (*Small business and inflation*, 2022). The same survey found that 99% of respondents reported that energy and gas costs are having some level of negative impact on their businesses, and of these, "over three-quarters (77%) of small employers reported that rising prices for 'fuel (gasoline, diesel, fuel oil, etc.)' is a substantial contributor to higher costs."

For consumers, the increased costs in accessing funding by way of loans for homes and cars are also rising and may become increasingly prohibitive for investment. Both high inflation and rising interest rates have led to mortgage rates that are "more than twice where they were just at the start of 2022" (Stauffer & Reed, 2022). Perhaps most interesting and telling of the economic conditions over COVID-19 and post-COVID-19 economies is that December 2020/January 2021 saw the lowest 30-year fixed mortgage rate in the history of home loans at 2.65%, based on historical data taken from Freddie Mac (*Primary mortgage market survey*, 2022).

Additionally, the increase in rates from 2.65% in early-2021 to over 7% (or more, depending on borrower capabilities) in mid-2022 constitutes one of the fastest escalations of mortgage rates in recent history, corresponding to a 185% increase over an 18-month period. According to a Mortgage Bankers Association survey (ending week of October 14, 2022): "Mortgage applications fell yet again last week, reaching their lowest level in 25 years, while mortgage interest rates hit their highest level since 1997" (Kan, 2022). Nevertheless, some are predicting a return to double digit rates in the year 2023 (Wiltermuth, 2022). Car loan average

interest rates have also increased, as have car prices (Holgate, 2022), and have yet to return to pre-pandemic rates.

In terms of purchasing power, access to long-term funding (e.g., home loans), medium-term funding (e.g., car loans), and short-term real time purchasing (e.g., market goods in the form of services and products) have all been negatively impacted by the lingering impacts of the global pandemic. All of this taken together adds up to impact lives in the present and confidence in the future of the U.S. economy (Daniel, 2022; Elmassah et al., 2022). Worker shortages and supply chain challenges impact small business's ability to create value and meet customer expectations and increased costs and stagnant wages put pressure on consumers' ability to meet their owns needs and in turn impacts their confidence in the economy's future.

Consumer's confidence is one of the leading indicators of where an economy is and where it is going in the future (Elmassah et al., 2022). Confidence in an economy's future is apropos and particularly relevant during times of turbulent political and economic uncertainties (Kellstedt et al., 2015). Analysis from a June edition of the University of Michigan Surveys of Consumers stated, "the early-June decline in consumer sentiment, settling 0.2 Index points below the preliminary reading and 14.4% below May for the lowest reading on record" (Hsu, 2022). Year-over-year (June 2021 to June 2022), the index fell by a striking -41.5%. An article on *Fortune's* website mentioned the existence of multiple other reports with similar findings (pointing to deteriorating conditions), adding: "If you ask economists, the drop is cause for concern, because consumer confidence is a key indicator of the potential for a recession" (Daniel, 2022).

While there are numerous compounding economic factors that have been exacerbated by COVID-19's lingering impacts, there have been positive signs pointing towards growth. According to the BEA the U.S. in 2022 Quarters 3 and 4 realized a 3.2% (Q3) and 2.7% (Q4) annualized increase in GDP, which was a bounce back after 2022, Quarters 1 and 2 which reported consecutive negative GDP growth (this scenario is typically regarded as being indicative of a recession). Couple this bounce back in GDP with a 50-year low in unemployment (3.4% in January and 3.6% in February 2023) these are some signs suggesting stabilization (*United States unemployment rate: March 2023 data*, 2023). Additionally, it should be noted that the U-6 (an indicator that documents those people who want to work but have given up searching and those working part-time because they cannot find full-time employment), is also at an 20 year low at 6.9% as of the end of 2022 (*Local Area Unemployment Statistics (LAUS): Alternative measures of labor underutilization for states, 2022 annual averages*, 2023). These optimistic observations do not overshadow the challenges still being experienced within the post-COVID-19 economy, and they contribute to the mixed signals being observed nationally.

CONSUMERS: BORROWING TO SURVIVE

To only report erosion in savings would be an inadequate portrayal, for it is also the case that consumers have increasingly been going deeper into debt. While current data does not necessarily capture an increase in small business borrowing and debt, there is a possibility that these realizations are still some months away. The Brookings Institute noted that, "both the

overall macroeconomy and business survival fared much better during the pandemic than initially feared or historical experience would have predicted" (Chodorow-Reich et al., 2022). Authors attributed this to the use of videoconferencing, COVID-19 testing protocols, the quick development of vaccines, and massive and unprecedented policy responses providing support for business. Among these policy responses were the creation of the Paycheck Protection Program (PPP), Economic Injury Disaster Loan (EIDL), targeted aid to industries most affected (such as airlines and the restaurant industry), expanding corporate bond purchase authorizations through the Corporate Credit Facilities (CCFs), and providing loans through the Main Street Lending Program (MSLP) to midsize corporations. Beyond survival, many businesses were able to partially or fully reopen sooner than anticipated. The U.S. Small Business Administration's (SBA) EIDL program provided support for nearly four million small businesses and nonprofits through its disbursement of $390 billion in loans (*Four million hard-hit businesses approved for nearly $390 billion in COVID Economic Injury Disaster Loans (EIDL)*, 2022).

The issue is that once consumers continue to feel the impacts of inflation along with a highly anticipated, if not current, recession, on their pocketbooks, plus rising interest rates (*Minutes of the Federal Open Market Committee [FOMC] September 20–21, 2022*, 2022; Serwer & Croll, 2022), businesses will certainly be impacted, and it is possible that we are still some months away from this. The additional cost of living has pushed many into deeper debt. According to a report by the New York Federal Reserve on the total national household debt across housing and non-housing debt, it is evident that the accumulated growth in each debt type "reflects increased borrowing due to higher prices" (*Quarterly report on household debt and credit: Q 2*, 2022). It was also observed that in the report, which was based on Equifax credit data, that household debt reached $16.15 trillion, which represents a record high (Caporal & Albright, 2022). Moreover, according to an article posted to *Liberty Street Economics* (a blog site connected with the Federal Reserve Bank of New York), authors observed increasing delinquency rates, especially in lower income areas and among sub-prime borrowers: "We are seeing a hint of the return of the delinquency and hardship patterns we saw prior to the pandemic" (Haughwout et al., 2022).

"Prices for both homes and motor vehicles have been rising, and the borrowing amounts have risen in tandem – in fact, the average dollar amount for new purchase originations of *both* autos and homes is up 36 percent since 2019" (Haughwout et al., 2022). Credit card debt balances have also been visibly affected by inflation. A $46 billion increase in balances on credit cards in quarter two were among the largest documented in the New York Federal Reserve dataset since 1999 and this demonstrated the largest year-over-year percentage increase in source of debt (credit cards) in more than 20 years (*Quarterly report on household debt and credit: Q 2*, 2022).

This visible manifestation of inflation through credit card debt has been attributed to the purchase of consumer goods and services purchased on the cards. Finally, as illustrated in Table 3, the growth in total household debt from 2021 to 2022 was 2-5 times any other year's increase in the past eight years.

TABLE 3[5]
U.S. National Housing and Non-Housing Debt from 2015-2022 (in trillions of dollars).

YEAR Q1	Housing Debt	Non-Housing Debt	Total Debt	% Increase year-to-year	Housing Debt % of total	Non-Housing Debt % of total
2022	$11.71	$4.45	$16.16	10.31%	72.46%	27.53%
2021	$10.50	$4.15	$14.65	2.44%	71.67%	28.32%
2020	$10.10	$4.20	$14.30	4.60%	70.63%	29.37%
2019	$9.65	$4.02	$13.67	3.40%	70.59%	29.41%
2018	$9.38	$3.84	$13.22	3.93%	70.95%	29.05%
2017	$9.08	$3.64	$12.72	3.84%	71.38%	28.61%
2016	$8.85	$3.40	$12.25	3.37%	72.24%	27.75%
2015	$8.68	$3.17	$11.85	1.72%	73.25%	26.75%

STARTUPS SURGE

According to Robert Fairlie, the lead researcher for the Kauffman Indicators of Early-Stage Entrepreneurship (and an economics professor at the University of California, Santa Cruz), based on 2021 data "the nation's startup spirit remained strong" (Meyers, 2022). But Fairlie also noted that due to factors such as unemployment and limited other options, many startups were likely born out of necessity. Over the most recent three-year period (2020, 2021, & 2022), small business growth has continued to outpace total pre-pandemic growth at an accelerated rate, e.g., 2018 – 3.5 million and 2019 – 3.5 million; growth was 2020 – 4.4 million, 2021 – 5.4 million, & 2022 – 5.1 million) (*Business Formation Statistics (BFS)*, 2022)[6]. Important to note is a majority of the new businesses that have been started are not considered high-propensity businesses. The U.S. Census classifies those businesses that have a "have a high-propensity of turning into businesses with payroll" (*Business formation statistics: Definitions*, 2022) as high-propensity. Such businesses are identified by the acronym, HBA, which refers to High-Propensity Business Applications; one tool to identify businesses that are likely to have employees is through declarations in the IRS form SS-4: Application for Employer Identification Number (EIN).

Among other data, an EIN application form collects responses to questions such as, "Highest number of employees expected in the next 12 months"[7]. Other indicators of a likelihood having employees include the NAICS industry code (i.e., type of business) with which

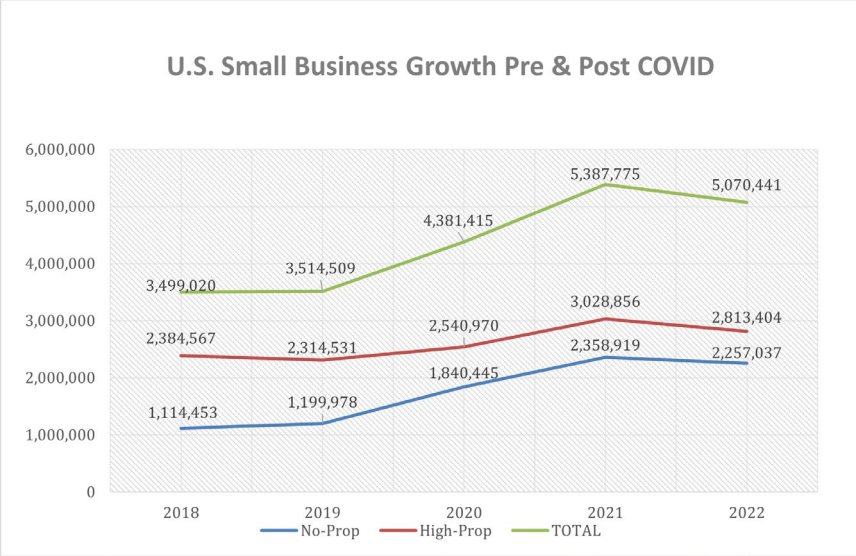
[5] Table based on data taken from https://www.newyorkfed.org/microeconomics/hhdc. Retrieved October 28, 2022.

[6] Numbers are rounded.

[7] Taken from line 13, online version of IRS form SS-4, current as of October 22, 2022. Retrieved from https://www.irs.gov/pub/irs-pdf/fss4.pdf

a startup is associated. Growth is evident in both high-propensity and no-propensity businesses, but a majority of the celebrated new small business growth is in businesses that are likely to *not hire* employees or manage associated payrolls. More precisely stated, according to the U.S. Small Business Administration's (SBA) most recent reporting, 81%, or 26,485,532 firms, have no employees (the SBA uses the term "nonemployer firms") whereas 19%, or 6,055,421 firms, have paid employees (identified as "employer firms") (*Frequently asked questions about small business*, 2021).

FIGURE 2[8]
U.S. small business growth – Pre & post COVID-19



While most of these results were prior to the proximity to realized inflation and recession on the horizon, attributing the challenges to the pandemic is appropriate, but there also seems to be a perception and action-orientation focused on opportunity associated with it as well. This phenomenon has been attributed to what disaster sociologist Charles Fritz (1996) identified as a "form of societal shock" (p. 55). It is possible that the challenging conditions associated with COVID-19 have impacted entrepreneurs to do what entrepreneurs do: take into hand and create value from difficulty. As the adage goes, "necessity is the mother of invention" (with origins often attributed to Plato's *Republic*) and is demonstrated each time individuals, nations, or people in the world at large have faced adversity. For those with an entrepreneurial mindset, the

[8] Table developed using U.S. Census Bureau, Business Formation Statistics (Web form based calculator at, https://www.census.gov/econ/currentdata/dbsearch?program=BFS&startYear=2004&endYear=2022&categories=TOTAL&dataType=BA_BA&geoLevel=US&adjusted=1&notAdjusted=1&errorData=0) – Total for all NAICS: U.S. (seasonally adjusted business applications 2018-2021 – to date), data extracted October 7, 2022.

flip side of any challenge is a potential opportunity, which often arises from creating solutions to problems. There has been a strong correlation suggested between opportunity and the conditions attributed to natural and human-made disasters.

In his seminal work, disaster sociologist Fritz (1996) noted that disaster "disrupts habitual, institutionalized patterns of behavior and renders people amenable to social and personal change" (p. 55). Fritz further suggested that disaster creates unstructured conditions, socially, that are amendable to innovation within a social system (Solnit, 2010). This idea that disaster can perpetuate innovation is consistent with Schumpeter's (1942) theory establishing the concept of creative destruction. This was framed as "the process of industrial mutation that continuously revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (p. 83). Similarly, Fritz's (1996) observations noted that one impact of natural disasters is the heightening of innovation and creativity.

Thus, adverse circumstances may lead to one of the ripest times for creativity and innovation to blossom. In times that are normal, innovation is almost pedestrian and expected. Ideas can be easily rejected with very little perceived consequence. Alternatively, in times of disaster and emergency (e.g., global pandemic) innovation and creativity may be absolutely necessary. The increase in small businesses, amidst the myriad other factors contributing to the difficulties faced, demonstrates the impact of disruption in a clear way (see the section on IMPLICATIONS FOR ENTREPRENEURIAL PRACTICE below).

SMALL BUSINESSES AND A RECESSION LOOMING?

The lingering effects of COVID-19 are continuing to contribute to inflation, and subsequently are still prevalent and active in edging the U.S. economy closer to recession. According to results from a recent survey conducted by Babson College and David Binder Research from June 20-23, 2022, and published by Goldman Sachs, the past few months (first half of 2022) have continued to take a toll on small business owners. Overwhelmingly, 93% were worried about a recession arriving in the next twelve months; almost 8 out of 10 (78%) reported that the economy has worsened in the past three months; (likely) corresponding with a worsening economy, 80% responded that inflationary pressures have continued to increase, with three-fourths (75%) indicating that their respective business has been negatively impacted in the past six months; hiring qualified workers and employee retention was reported as the top challenge for small business owners (*Survey: Small business challenges worsen amid record inflation and workforce shortages*, 2022).

Another survey conducted by NFIB Research Center also appeared to support the notion that while small businesses are still hiring (and having difficulties doing so), they do fear a recession is coming; almost two-thirds (64%) indicated that they were hiring (*Recession fears not yet hitting small business hiring or increases in compensation*, 2022). While this report did not quantify the extent to which small businesses feared a coming recession, it did characterize such an eventuality as "widely anticipated." Further, it included an observation that "owners are the most pessimistic about future business conditions in [sic] 48-year history of the survey." The most current (August 2022) NFIB Research Center survey measuring with its Small Business

Optimism Index (i.e., survey) reported the eighth consecutive month below a 48-year average (Dunkelberg & Wade, 2022). Presently, small business owners' concerns are evident and increasing inflation continues and symptomatic recession is materializing daily (Dunkelberg & Wade, 2022; *Small business and inflation*, 2022).

IMPLICATIONS FOR ENTREPRENEURIAL PRACTICE

Recognizing and understanding the conditions and the opportunities that emerge in any environment is in direct alignment with what is expected of entrepreneurs. We have been observing developments of historic proportions. These include record-setting interest rate increases by the Federal Reserve; historic household debt; inflation (record fuel prices); and declines in consumer confidence. From an anecdotal perspective, "Help Wanted" signs, closed dining areas, and difficulty buying certain products at retail, persist. These conditions suggest that documenting, analyzing, and forecasting what may come, and how to respond, is entrepreneurship researchers' responsibility. Concomitantly, this is true for practitioners. One lesson here is we do not have to fear bad outcomes will necessarily be the case in light of economic challenges.

In fact, a theory of "entrepreneurial alertness" (Valliere, 2013) codifies and explicitly identifies the value and process whereby entrepreneurs mediate, evaluate, and respond to changes in an environment. In these spaces, entrepreneurs, "impute meaning to environmental change that would not be imputed by other managers" (p. 430) in the same way. As observed by Kim and Lim (2018), not only is it necessary to recognize opportunities to innovate, entrepreneurs must also be able to exploit these effectively if they are to realize any benefits (financial or non-financial). Tang et al. (2012) identified three dimensions associated with the entrepreneurial alertness construct: environmental scanning and searching heightens entrepreneurial knowledge base, association and connection links external observations with a novel perspective, and evaluation and judgement focus to determine possible opportunity. To these ends, understanding the conditions driving the U.S. economy while viewing some of these as problems that may need innovative solutions, the entrepreneur may identify opportunities.

The perspective, disposition, and mindset of entrepreneurs who take into hand these circumstances and work to rise above and beyond is critical to their success. Difficult times often do present a plethora of teachable moments for future entrepreneurs (and educators). Finally, understanding economic conditions and opportunities is an essential aspect of entrepreneurial education. Conditions (entrepreneurial ecosystems) and opportunity (entrepreneurial response) go hand-in-hand.

CONCLUSION

Buffington, et al., predicted "that the pandemic may lead to lasting structural changes in the economy" (2021, p. 4). For instance, the adoption rate for new technologies such as, shopping apps; greater acceptance of virtual meetings and remote work (including medicine, education, and religious services); and a greatly heightened awareness of the interdependencies

we all have in a global economy. Clearly, prior to COVID-19, vulnerabilities such as microprocessor chip shortages had not been anticipated, with pervasive impacts across varied industries (e.g., automobile production, refrigerators, other consumer electronics).

Starting in June 2022 the Federal Reserve has been attempting, via a series of interest rate hikes to address inflationary pressures of historic proportions in the economy. According to the minutes from a joint meeting of the Federal Open Market Committee (FOMC) and the Board of Governors of the Federal Reserve System at that time, it was observed that the "labor market was very tight, inflation was well above the Committee's 2 percent inflation objective, and the near-term inflation outlook had deteriorated" (*Minutes of the Federal Open Market Committee [FOMC] June 14–15, 2022*, 2022, p. 9), following its previous meeting in May. The policy action taken was that a majority of participants agreed to increase interest rates by 75 basis points (.75 percent). The FED's objective was (and has been) to tame inflation, yet it has also acknowledged this may be a difficult balancing act without creating a swing in an economic pendulum that results in a recession. Reported by *Barron's*, "The early verdict is mixed" (Cassella, 2022). As noted in the aforementioned FOMC meeting minutes, hardships due to inflation are especially the case with "low- and moderate-income households" (p. 8).

Later in the year, in its November 2 press release (corroborated by meeting minutes) Federal Reserve voted to again raise interest rates by .75 percent (*Federal Open Market Committee [FOMC] November 1–2, 2022*, 2022), as it also did in July (*Minutes of the Federal Open Market Committee [FOMC] July 26–27, 2022*, 2022) and September (*Minutes of the Federal Open Market Committee [FOMC] September 20–21, 2022*, 2022). Thus, four times in a row (at that point), the committee voted for .75 percent increases, pushing the primary credit rate to 4 percent as of November 3, 2022. The FOMC's decision to continually increase rates has been sustained but softened slightly in the first quarter of 2023 (in the wake of the second largest bank failure in history – Silicon Valley Bank), which alludes to a potential stabilization of inflation in the next year. However, once on the other side of this bank failure and response, the FED may or may not resume its aggressiveness if it remains true to its earlier statements to achieve a 2% inflation rate. Between June 2022 and March 2023, the FOMC increased the federal funds rate 9 consecutive times. These actions are second only to one other period of rate increases in the past 32 years, between 2004 and 2006. In the earlier instance, there were 17 consecutive increases, but these were at a much smaller increment (+.25% each time), ultimately increasing the federal funds rate from 1.25%-5.25% over that duration. It is noteworthy to mention that the predictable increment at that time could almost be regarded as comforting compared to the uncertainty that is brought by each FOMC meeting in present times. The prior increases were more gradual (smaller increments over a longer period), whereas the more recent series of increases were at a far more vertical trajectory. This recent level of aggressiveness towards increases has not been experienced in the U.S. economy in at least thirty-plus years and will continue to have an impact on both consumers and businesses.

Estimating the extent of a recession in terms of economic impacts on both consumers through personal spending (*Personal income and outlays, August 2022 and annual update*, 2022) and small businesses' responses (*Small business owners expect a recession, but few are ready for one*, 2022) remains daunting. An article in *Forbes* (Bushard, 2022) aggregated several

executives' sentiments about a coming recession, starting with Elon Musk, whose Twitter feed was quoted; Musk predicted a recession lasting until the spring of 2024. As the article continued, it was reported that grim economic outlooks were indicated by both Morgan Stanley CEO James Gorman and Citigroup CEO Jane Foster. Bank of America "is already 'baking in' a recession," according to its CEO, Brian Moynihan. Chase CEO Jamie Dimon, speaking to analysts and investors was quoted by CNBC to say "You know, I said there's storm clouds but I'm going to change it … it's a hurricane" (Son, 2022). Goldman Sachs CEO David Solomon predicted "a good chance of a recession" during his (different) interview on CNBC (Cox, 2022).

Besides Musk, other highly visible tech company executives have been speaking out. Meta Platforms (parent of Facebook), led by CEO Mark Zuckerberg, noted in its second quarter earnings call on July 27, 2022, that "we seem to have entered an economic downturn that will have a broad impact on the digital advertising business. It's always hard to predict how deep or how long these cycles will be, but I'd say that the situation seems worse than it did a quarter ago" (Zuckerberg, 2022, p. 1). As quoted in Fox News coverage, Amazon founder Jeff Bezos posted a response to the Goldman Sachs CEO interview on CNBC, using his Twitter feed[9]: "Yep, the probabilities in this economy tell you to batten down the hatches" (Henney, 2022).

Whether predictive evidence comes from indices of consumer or small business owners' confidence (Hsu, 2022; *Small business owners expect a recession, but few are ready for one*, 2022; *Survey: Small business challenges worsen amid record inflation and workforce shortages*, 2022), banking and other industry leaders, financial markets (e.g., inflation, debt and interest rates), or quotes captured in FOMC meeting minutes, it appears there are sustained challenges ahead for the U.S. and global economy at large. An unprecedented circumstance calls for an unprecedented response and we believe that is what we are seeing here through policy responses, but also in terms of entrepreneurial response. As our economy continues to work to recover from these conditions, it is necessary to document our recent past, and pay close attention to our present, in order to inform our future responses to the evolving consequences – both those intended and unintended and those short-lived and sustained. Small businesses need to monitor their operating environments closely, and adapt, if they are to navigate through these volatile economic conditions.

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[9] Bezos' Twitter post is captured directly, here: https://twitter.com/jeffbezos/status/1582517044020273152

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SUSTAINABLE ENTREPRENEURSHIP: SPACEX PAVING THE WAY TO MAKING LIFE MULTIPLANETARY

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ABSTRACT

To say Elon Musk is a disrupter is quite an understatement. The self-made billionaire has transformed several industries (Electric Vehicles, financial services, space travel, hyperloops, artificial intelligence, etc.). He is also a charismatic marketing genius who is able to create buzz and excitement whenever he speaks or tweets. Privately funded space exploration startups, such as Elon Musk's SpaceX and Jeff Bezos's Blue Origin, have made giant strides in efforts to send humans to other planets. However, both companies built expendable launch vehicles (ELVs) that are used only once. Typically, the rocket has been the most expensive component in the preparation of a space trip. It consists of tremendous amounts of alloys, metals, plastics, minerals, conductors, pollutants; that are essentially used once. The environmental costs are substantial. Musk and SpaceX's R&D team had been working on developing a reusable rocket, Falcon 9, to reduce the cost of spaceflights and minimize environmental damages. The rocket is a new-to-the-market product exemplifying disruptive technology. For a price, SpaceX was planning on taking civilians to outer space, the moon, and even Mars. SpaceX went through six of the seven steps in the new-product development process (idea generation, idea screening, concept development and testing, business analysis, product development, test marketing). The Falcon 9 market testing phase was completed in 2023; and product launch (commercialization) was set for 2024. The stakes couldn't be higher. The new product, Falcon 9, could not only determine the future of the company but possibly that of the entire space tourism and travel industry. The paper utilizes two marketing concepts (Diffusion of Innovation and Product Life Cycle) to predict the prospects of SpaceX and the space industry as a whole. The paper also strives to explain how innovation can give a company a first-mover's advantage and shape the viability of a new industry.

Keywords: Innovation, Entrepreneurship, Space Travel, New Product Development, Product Life Cycle, Sustainability.

INTRODUCTION

The South African-Canadian-American entrepreneur, Elon Musk, is best known for his cosmic imagination and risk-taking drive to bring about a more high-tech world. Musk has an impressive resume and a knack for founding avant-garde companies, with SpaceX as the crown jewel. He is promising to get rid of internal combustion engines and fossil fuels. He is promising

100% self-driving cars with zero emissions. He is promising hyperloops below Earth and colonies on Mars. Fortunately, he has the passion and the money to make it happen. Known for the companies he has founded or developed including PayPal, Tesla, and SpaceX, Elon Musk has had a gigantic impact on multiple industries and is poised to have a major influence on the space industry in particular (Vance, 2020). It is safe to say that the self-made billionaire is striving to revolutionize mobility both on Earth and in space, and has become the world's richest person in the process. Musk is the world's wealthiest entrepreneur with a net worth of $250 billion (Forbes, 2023).

Musk and his R&D teams worked diligently to put new products on the market. They went through the new-product development (NPD) process on a daily basis. The reusable rocket, Falcon 9, is a classic example of how an entrepreneur can utilize the NPD process to create a sustainable product that transforms an entire industry (Musk, 2017).

SUSTAINABLE ENTREPRENEURSHIP

Sustainable entrepreneurship, also known as green or eco-entrepreneurship, refers to the practice of starting and growing a business that focuses on addressing social and environmental issues without negating the drive for profit. The goal of sustainable entrepreneurship is to create a positive impact on the planet, society, and the economy by integrating principles of sustainability into business operations.

Key features of sustainable entrepreneurship include (Elliott, 2022):

Triple Bottom Line: Sustainable entrepreneurs aim to achieve a triple bottom line, which considers not only financial success but also social and environmental outcomes. This is often summarized as "people, planet, and profit."

Environmental Responsibility: Sustainable entrepreneurs prioritize environmental sustainability by adopting eco-friendly practices, reducing resource consumption, minimizing waste, and promoting conservation.

Social Impact: In addition to environmental considerations, sustainable entrepreneurship emphasizes social responsibility. This may involve creating products or services that address social challenges, improving working conditions, or contributing to local communities.

Innovation: Sustainable entrepreneurs often seek innovative solutions to address social and environmental issues. This could involve developing new technologies, business models, or products that have a positive impact.

Ethical Supply Chains: Ensuring that the entire supply chain is ethically managed is a common practice in sustainable entrepreneurship. This includes sourcing materials responsibly, treating workers fairly, and promoting transparency.

Long-Term Perspective: Sustainable entrepreneurs typically adopt a long-term perspective, considering the enduring impact of their business decisions on the environment, society, and the economy.

Stakeholder Engagement: Engaging with and considering the interests of various stakeholders, including employees, customers, local communities, and investors, is a fundamental aspect of sustainable entrepreneurship.

Sustainable entrepreneurship is driven by the recognition that business success is interconnected with the health of the planet and the well-being of society. It reflects a shift towards more responsible and conscientious business practices in the face of global challenges such as climate change, resource depletion, and pollution. Musk is a strong advocate of sustainable entrepreneurship and his vision could be seen in how the Falcon 9 was developed and manufactured. SpaceX's commitment to reusability aligns with sustainability goals by reducing resource consumption and waste associated with traditional expendable rocket designs. The Falcon 9 is best known for its reusable design, which contributes to sustainability in spaceflight. The rocket is designed to be recovered, refurbished, and reused for multiple launches. This reusability feature is aimed at reducing the cost of space access by minimizing the need for building new rocket components for every launch (Rich, 2018).

SPACEX PIONEERS REUSABLE ROCKETS

The Falcon 9 rocket went through six of the seven steps of the new-product development process, and the November 2023 launch would determine if the company could move forward with the last step. The new-product development process typically consists of the following steps (Zomerdijk & Voss, 2011): idea generation, idea screening, concept development and testing, business analysis, product development, test marketing, and commercialization.

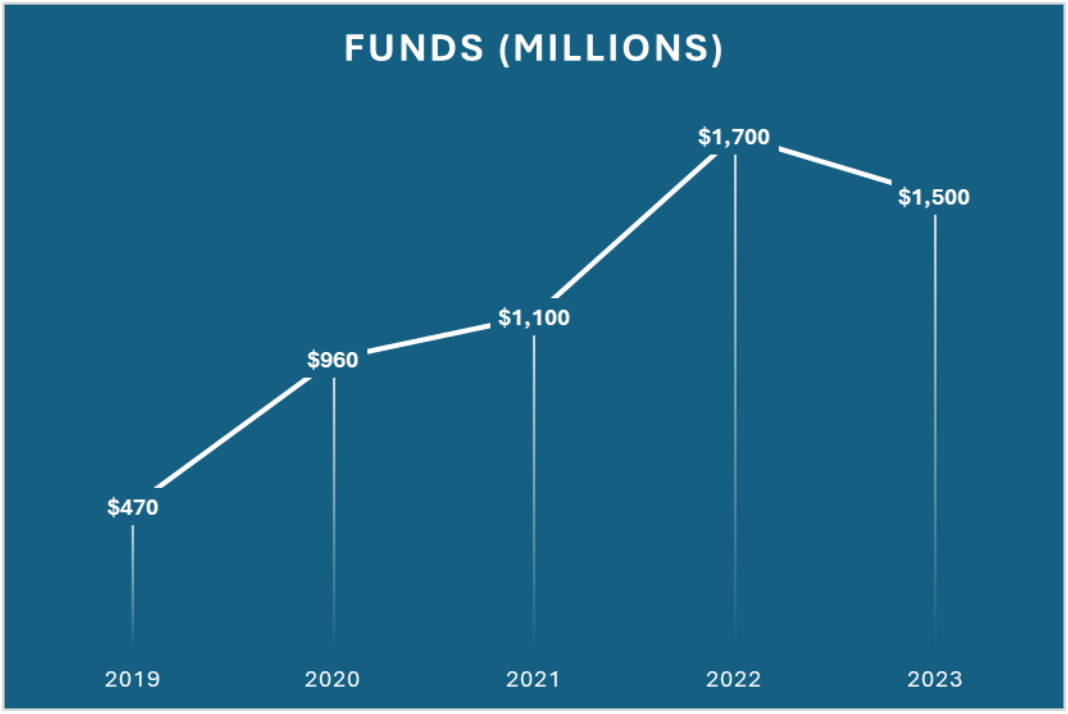
1. **Idea Generation:** Space tourism and travel has been a topic of fascination for humans ever since the first man stepped on the moon in 1969. In the 1980s, the world's two superpowers (USA and Russia) revealed plans to send civilians into space, but the idea failed to gain traction. It was not until the early 2000s that space tourism became a reality with the launch of the first privately funded spaceflight by SpaceShipOne in 2004. Several private companies were founded that opened a whole new frontier for human space exploration and adventure after the aircraft/rocket hybrid completed the first, crewed, private spaceflight. However, those private companies built expendable launch vehicles (ELVs) to be utilized only once. The Falcon 9 reusable rocket idea was that of Elon Musk, the CEO of SpaceX, as part of his vision to reduce the *skyrocketing* cost of spaceflights and to send humans to Mars. During this phase of new product development, his team also expounded upon Russian scientist Konstantin Tsiolkovsky's 1895 idea of building a gigantic space elevator, or orbital lift that could take humans to the moon and eventually to other planets (Mellor, 2021).

2. **Idea Screening:** At the time, Musk rejected the space elevator, citing potential issues with safety, regulatory compliance, and liability and continued to push forward with the reusable rocket idea. Musk and his team asked (and answered) key questions, such as: a) can the rocket be developed and marketed within the time and budget constraints of SpaceX? and (b) is the proposed product within the company's ability to produce? The idea for the Falcon 9 rocket was unanimously agreed upon (by both the board and R&D team) to move forward in the NPD funnel. SpaceX conducted a feasibility study to determine whether the proposed rocket was technically and financially feasible. The study included a review of the available resources and analysis of the technology required to turn the idea into reality.

3. **Concept Development and Testing:** Once the feasibility study was completed and the idea was deemed viable, SpaceX began to develop the concept for the Falcon 9 rocket. This involved creating a detailed design specification, identifying the key components and raw materials required, and identifying the suppliers, partners, and logistics needed to build the rocket

4. **Business Analysis:** Before proceeding with the development of the Falcon 9 rocket, Musk and his team conducted a detailed business analysis to determine the financial viability of the project. This included estimating the development and production costs, analyzing the potential market demand, determining the break-even point per launch, and identifying the potential revenue streams (Martin, 2018). The company raised almost $6 billion from 2019 to 2023 (Figure 1). SpaceX was willing to take risks and invest significant resources to develop reusable rocket technology that could substantially lower the cost of going to space and eventually mainstream space travel (Hull, 2018).

Figure 1. Money Raised Through Funding Rounds by SpaceX (2019 – 2023)

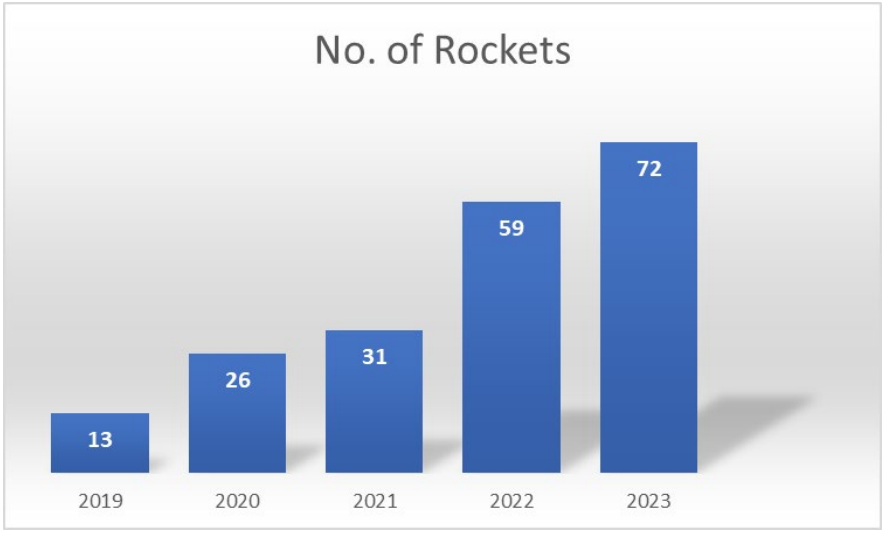


Source: Statista (2023)

5. **Product Development:** With the business analysis completed and the concept for the Falcon 9 rocket fully developed, SpaceX began the product development phase. This involved building prototypes, conducting tests, and refining the design based on the results of the testing. A dozen prototypes were built and launched. SpaceX's reusable rockets were consistently improved to be more cost effective than traditional single-use rockets (Bennett, 2018).

6. **Market Testing:** Once the Falcon 9 rocket was fully developed, SpaceX conducted market testing to determine how well the rocket would be received by the company's niche target market. This involved conducting test launches (crewed and un-crewed) and receiving feedback from potential customers and stakeholders. There were approximately 200 Falcon 9 launches over the last five years (Figure 2). Unfortunately, SpaceX experienced a total of four Falcon 9 rocket explosions during the market testing phase (Einhorn, 2022). The most recent explosion took place in November 2020, during a mission to launch the Sentinel-6 Michael Freilich satellite. It's noteworthy that while these incidents were setbacks for SpaceX, the company has learned from them and continued to improve its proprietary rocket technology (Hull & Johnsson, 2020).

Figure 2. Number of Rockets Launched by SpaceX (2019 - 2023)



Source: Statista (2023)

7. **Commercialization (Product Launch):** Finally, with the market testing completed and the Falcon 9 rocket fully developed, SpaceX launched the product commercially and was on the cusp of selling seats to customers interested in going to the edge of space, the moon, and even Mars. The company continues to refine and improve the Falcon 9 as it strives to make space travel more accessible and affordable.

In brief, Falcon 9 is the world's first orbital class reusable rocket. Reusability allows SpaceX to re-fly the most expensive component of the trip, which in turn drives down the cost of space travel. Although this process may appear linear, Musk knew he would constantly have to backtrack to earlier process stages when issues arose. The Falcon 9 rocket has introduced several innovations in the space industry that aim to improve sustainability compared to traditional rockets (Vanham, 2023).

Reusable Technology: One of the key sustainability features of the Falcon 9 is its reusability. The first stage of the rocket is designed to be recovered and reused for multiple launches. This can potentially reduce the overall cost of space travel and minimize the environmental impact associated with manufacturing new rockets for each mission.

Reduced Cost: By reusing rocket components, SpaceX aims to make space travel more cost-effective. Lowering the cost of launching payloads into space can make space exploration and commercial activities more accessible and economically viable.

In conclusion, the Falcon 9's reusability features contribute positively to its sustainability compared to traditional expendable rockets. However, assessing the full sustainability of space activities involves considering the broader ecosystem of manufacturing, launch, and orbital practices. It's important to note that the overall sustainability of space activities involves various factors beyond rocket reusability, such as the environmental impact of rocket propellants, space debris management, and the responsible use of space resources (McHale, 2022).

DIFFUSION OF INNOVATION AND PRODUCT LIFE CYCLE

Before moving to the final step of commercialization, Musk knew he needed to forecast two factors associated with any new product/technology: diffusion of innovation and product life cycle. Diffusion of innovation describes how new ideas, products, or technologies are adopted by consumers over time. Consumers fall into five categories: innovators, early adopters, early majority, late majority, and laggards. Each group has different characteristics that influence their decision to adopt an innovation (Rogers, 1962). Musk envisioned SpaceX's Falcon 9 reusable rockets would have the following types of customers:

1**. Innovators:** For Falcon 9, innovators would be the handful of billionaires willing to take overwhelming risks and pay staggering amounts of money to go to outer space, the moon, and Mars. They are adventurers obsessed with the idea of newness and unafraid to take risks when it comes to trying new experiences, even if they fail. They take pride in being the first ones to try something (Grush, 2023).

2. **Early Adopters:** Early adopters would be the dozens of wealthy and risk-taking space enthusiasts. They would recognize the potential cost savings and efficiency gains of using a reusable rocket and would be willing to take a chance on this new technology. They are opinion leaders and are content to be second to try something.

3. **Early Majority:** The early majority would be the hundreds of ultra-rich customers who are now more comfortable using reusable rockets after seeing the success of SpaceX. They are more risk-averse than the early adopters but still recognize the benefits and possibilities of space travel. By the time the early majority buy a product, more competitors have entered the market; this group will have some choice as to which space company to fly with.

4. **Late Majority:** The late majority would be the group that adopts new technologies only after they are well-established in the market. In the case of Falcon 9, the late majority would be relatively rich customers who are hesitant to use reusable rockets until they became the norm in the industry.

5. **Laggards:** Laggards are the last group to adopt new technologies, if at all. In the case of Falcon 9, laggards would be the average consumers who use the technology only after it has become mainstream. They pay the lowest price and take the least amount of risk. Most likely laggards won’t be taking space flights in this century!

The product life cycle (PLC) is a useful framework for analyzing the evolution of a product or service over time, from its introduction to its eventual decline. The space tourism industry is a new and emerging sector that has yet to reach the growth phase, but we can still apply the concept of the PLC to gain insights into space tourism’s potential trajectory. This

industry refers to the promising business sector focused on providing commercial, recreational trips to outer space and other planets for private individuals. The industry aims to make space travel more accessible and affordable to the public, offering a range of experiences such as suborbital flights, orbital stays, and lunar expeditions. Musk knew he had to keep an eye on the competitive landscape. Beside SpaceX, key players in the space tourism industry include (Grush, 2022):

Blue Origin: Founded by Amazon's Jeff Bezos, Blue Origin is developing the New Shepard rockets for suborbital space tourism, allowing passengers to experience a few minutes of weightlessness and view Earth from the edge of space. Blue Origin is also planning to send humans to the moon on the New Glenn rocket as early as 2024 (Bohannon, 2023).

Virgin Galactic: Founded by Sir Richard Branson, Virgin Galactic is developing the SpaceShipTwo vehicle for suborbital space tourism. Passengers will experience several minutes of weightlessness during a parabolic flight trajectory before returning to Earth.

Axiom Space: A private company focused on developing a commercial space station, Axiom Space aims to offer private stays in space for both tourists and scientists.

Orion Span: A California-based company founded by Frank Bunger. This startup has announced plans to build a luxury space hotel, the Aurora Station, which would orbit Earth and accommodate guests for short-term stays. Orion Span claims to have a waiting list for trips to the space hotel. Tickets start at around $10 million per person.

SpaceX has a pioneering advantage over its competitors. The company's reusable rocket technology is proprietary, meaning it is owned by the company and not available for others to use without permission. SpaceX has invested significant time and resources into developing its Falcon 9 rocket. The company has filed many patents to protect its valuable intellectual property. However, this does not downplay competitive threats. All five companies have great resources and even greater aspirations to take the space tourism industry to a whole new horizon.

Musk predicted the industry to go through these stages (Case & Bachman, 2021):

1. **Introduction:** The space tourism industry is currently in the introduction phase, with a small number of companies offering suborbital flights to wealthy individuals. This phase is characterized by low sales, high marketing and R&D costs, and limited consumer awareness.

2. **Growth:** As space tourism becomes more established and accessible, Musk expects a period of rapid growth. This phase will be marked by increasing consumer demand, as well as more competition and innovation in the market in the next few decades. New players may enter the industry, and existing companies will seek to expand their offerings and improve their technology and infrastructure.

3. **Maturity:** As the industry becomes more established and mainstream by the end of the century, Musk foresees a period of slower growth and more stable sales. Competition will be fierce, and companies will need to focus on differentiation and cost leadership to maintain their market share. The industry may also face regulatory challenges as it becomes more widespread. Sales and profits will begin to drop in the maturity stage as competition increases and customers begin to look for the next big thing (Lee & Chen, 2009).

4. **Decline:** Ultimately, the space tourism industry may reach a decline phase, either due to oversaturation, technological obsolescence, or changing consumer preferences. However, given the relatively early stage of the industry, Musk predicted a decline would occur in the next century or two, and he wasn't very concerned that sales and profits would fall off completely during the decline stage.

The space tourism industry is currently in the introduction phase of the product life cycle, with significant potential for growth and expansion in the coming decades. However, as with any emerging industry, there are also risks and uncertainties that must be navigated to achieve long-term success. Sending humans to the moon or Mars is obviously a more complex and expensive undertaking that requires significant investment and resources. A trip to the moon typically takes around three days from Earth to lunar orbit. On the other hand, a trip to Mars takes significantly longer due to the greater distance between Earth and Mars. Depending on the alignment of the planets at the time of launch, a trip to Mars can take anywhere from six to nine months one way.

SpaceX's Falcon 9 is a new-to-the-market product exemplifying disruptive technology. The groundbreaking reusable rocket displaces an established technology (ELVs) and shakes up the space industry. Traveling to the moon or even Mars by people other than astronauts has become more of a reality. For space tourism to become mainstream, the industry must be profitable enough to motivate privately funded companies to undertake the staggering costs and long-drawn-out R&D processes required to make space travel safe and affordable. This demonstrates the significance of pricing and generating revenue in the introduction and growth stages. SpaceX has a first-mover's advantage space tourism, and Elon Musk has the vision to capitalize on that. Clearly, the introduction of a new product is a vast undertaking with a lot of open-ended questions, even for a prominent, multi-billion-dollar company.

For thousands of years people lived their entire lives and rarely saw a new product. This changed with phenomenal advancements in transportation and communication technologies. This highlights the significance of innovation and having a pioneering advantage. First-mover's advantage can generate an edge that could be very hard to duplicate. Most people know who was the first person to fly solo across the Atlantic Ocean? A lot of people know that the first man was Charles Lindbergh and the first woman was Amelia Earheart. In 1927, Lindbergh flew solo for 33.5 hours from New York to Paris. His trip ushered in a new era in the history of aviation. However, many people do not know who was the second person to fly solo across the Atlantic? Nobody knows and probably nobody cares! Therein lies first-mover's advantage—people only remember the first.

SUSTAINABILITY IN SPACE TRAVEL INDUSTRY

Sustainability in the space travel industry refers to the efforts and practices aimed at minimizing the environmental impact and resource consumption associated with space exploration and related activities. The space travel industry has traditionally been resource-intensive and associated with significant environmental challenges. However, as space exploration and commercial activities in space increase, there is a growing recognition of the need to adopt sustainable practices to mitigate negative effects on Earth and space environments.

Key aspects of sustainability in the space travel industry include (Elliott, 2022):

- Reducing Environmental Impact: Space launches, rocket propellants, and space debris can contribute to environmental pollution and impact Earth's atmosphere. Sustainable practices involve developing cleaner propulsion technologies, minimizing the use of harmful substances, and addressing the issue of space debris through responsible satellite and spacecraft disposal methods.
- Resource Utilization: Sustainable space exploration involves finding ways to use resources efficiently, both in terms of materials and energy. This includes exploring in-situ resource utilization (ISRU), where resources available on other celestial bodies, such as the Moon or Mars, are used to support human activities rather than relying solely on Earth-sourced materials.
- Reusable Technology: Developing reusable launch vehicles and spacecraft is a key aspect of sustainability. Reusability can significantly reduce the cost of space exploration and decrease the environmental impact associated with manufacturing and launching single-use vehicles.
- Alternative Propulsion: Research into alternative and more environmentally friendly propulsion systems, such as electric or ion propulsion, is another avenue for sustainability in space travel. These systems can be more efficient and produce fewer harmful by-products compared to traditional chemical propulsion.
- International Collaboration: Collaboration between countries and space agencies can lead to more sustainable practices by sharing knowledge, resources, and technology. International agreements and guidelines for responsible space activities can help ensure that space is used sustainably and for the benefit of all nations.
- Space Habitat Design: For long-duration space missions or the establishment of colonies on other celestial bodies, designing habitats with sustainability in mind is crucial. This involves recycling systems, closed-loop life support, and energy-efficient technologies.
- Education and Outreach: Raising awareness and educating the public about the environmental impact of space activities and the importance of sustainability can foster a sense of responsibility and encourage the adoption of sustainable practices in the industry.

Sustainability in the space travel industry is a multifaceted challenge that requires technological innovation, international cooperation, and a commitment to responsible and ethical practices to ensure the long-term viability of space exploration.

CONCLUSION

The reusability of the Falcon 9 rocket is considered a step toward more sustainable space exploration. It helps to lower launch costs and reduce the environmental impact associated with manufacturing new rocket components for each mission. Additionally, the development of reusable rocket technology has the potential to make space exploration more economically viable and sustainable in the long run. SpaceX has been working towards the goal of making space

travel more sustainable and reducing the cost of space exploration. Sustainability, in this context, can be interpreted in various ways.

Environmental Impact: SpaceX's reusable rocket technology, demonstrated through the Falcon 9 and Falcon Heavy rockets, is a significant step towards reducing the environmental impact of space launches. Reusability lowers the cost of launches and reduces the need for manufacturing new rocket components for each mission.

Market Competitiveness: By lowering the cost of launching payloads into space, SpaceX has increased access to space for various entities, including commercial satellite companies and government agencies. This has led to increased competition and innovation in the space industry.

Space Exploration and Colonization: SpaceX's long-term goals include making life multiplanetary by establishing human colonies on Mars. While this is a challenging and ambitious objective, success in this area could contribute to the long-term sustainability of human civilization beyond Earth (Droste, 2023).

However, it's important to note that the term "sustainability" can also be applied to a company's financial health. As of my last update, SpaceX has achieved several milestones and secured contracts with NASA and commercial customers, contributing to its financial stability. Continued success in securing contracts, advancing its reusable rocket technology, and achieving its Mars colonization goals will likely play a role in the company's long-term sustainability. It's important to note that the timeline for these plans is highly ambitious and subject to change based on various factors, including technical challenges, regulatory approvals, and funding. For the latest information, checking SpaceX's official announcements and news updates.

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